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# Dictionary of Ichthyology

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# Dictionary of Ichthyology

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**Revised:**

## Introduction

The following dictionary defines terms used in the study of fishes (= ichthyology in its widest sense). It includes terms not specific to that discipline but commonly used by it.

There seems to be various ways of presenting words in an alphabetical sequence. A consistent style is followed here and is fairly obvious. Abbreviations appear as though they were words, e.g. TAC (total allowable catch) appears before tackle, not at the beginning of the letter T. A separate, duplicate file on abbreviations makes searches for such terms easier. Hyphenated words precede non-hyphenated words. In the latter case, some sources hyphenate words while others combine two words as one. If a term comprising two words is not found it may be lower down in the Dictionary as a hyphenated word or a single word. Note also that many terms may be preceded by the word "fish", e.g. fish gig can appear as such or under gig; most such terms occur in both forms but searches should bear this in mind.

The urge to link all terms within definitions was resisted as broken links are frustrating to the reader and tedious for the lexicographer. Similarly, extensive links to websites are not given; various search engines can give access to sites with more information than the definitions here.

The alphabetical link at the head of each letter file will lead to terms within terms, should further explication be required. Generally terms that are defined by another term with a different initial letter have a definition in parentheses copied from the other term to save the need to flip around between letter files. An exception is made for a term that is under the same letter of the alphabet as it can be found by scrolling up or down, or doing a search. Some terms may have *q.v.* after them, indicating that this term is related to another term, defined and explained under the appropriate letter file but implying this is too long or distracting to insert here. Occasionally related terms are indicated by See...., compare, or *cf.*.... for compare.

Words in italic are from the Latin (or latinised Greek) and generally are scientific names of species, terms used in nomenclature, or some Latin words and phrases commonly used in

English and scientific works, e.g. *et alii* meaning "and others". Latin names of bones and muscles are not italicised (usage differs and there is a trend not to use italics, except of course for scientific names). Here italics are used (other than in scientific names) to separate terms and their meanings more clearly without having to state repeatedly that the terms are in Latin. Note that many anatomical terms have both English and Latin versions, the latter less used today but appearing in older works and in some comprehensive studies. Not all Latin versions of terms are included here but most are easily translatable although grammar differs, e.g. *ductus endolymphaticus* is endolymphatic duct. Plurals are given of Latin and Greek based words as these may not be intuitively familiar to readers of a non-European background or to younger European readers (!).

Spellings of words vary between American and English English. The latter may favour (favor) the letter "s" over the letter "z" and the "ae" combination over the simpler "e". Readers should be aware of these possible variant spellings. English spellings are followed here with some variant forms in American English included as an aid to the British and those whose first language is neither form of English. Note that the æ and œ formats are variably used for ae and oe throughout this work. Latin words often use the more archaic form unless they are in common ichthyological use in English.

A number of terms are simply English words, used in a special sense in ichthyology, but having another meaning; in some cases both definitions are given for clarity. Sometimes they are compounded from correct but obscure English words, prefixes and suffixes, e.g. obbasal. Some words have common roots in Latin or Greek and can easily be understood by those with some familiarity with these languages, e.g. vermiform, vermicular, vermiculate - for non-Eurocentric readers such similar words are defined here although not unique to the study of fishes.

Some entries have fish examples cited, given as the Latin name. The names are either the scientific name (in italics), the family name (ending in -idae) or the order name (ending in -iformes)(the latter two not in italics). A few other higher groupings are mentioned, particularly Amphioxo (Cephalochordata or lancelets, which are not "fishes" but share some anatomical characters), Myxini (the hagfishes), Petromyzontiformes (lampreys), Holocephali (chimaeras), Elasmobranchii (sharks, skates and relatives), Teleostomi (all the bony fishes), Dipnoi or Dipneusti (lungfishes), Actinopterygii (the ray-finned bony fishes), Teleostei (or teleosts, all the ray-finned bony fishes except Polypteriformes, Acipenseriformes and Amiiformes), and Ostariophysi (usually in the old sense of Cypriniformes, Characiformes, Siluriformes and Gymnotiformes; now including Gonorynchiformes). Nelson (2006) and earlier editions of his work can be consulted for those unfamiliar with fish diversity, as well as web sites such as [www.fishbase.org](http://www.fishbase.org).

Families and species of fishes are not described in this Dictionary. Scientific names of fishes are best accessed through the "Catalog of Fishes" at [www.calacademy.org/research/ichthyology/catalog](http://www.calacademy.org/research/ichthyology/catalog) while common names are best found in regional works (see Coad (1995) in the References). Some unusual common and scientific names may be included in the Dictionary for reasons of clarification and education.

Illustrations of certain terms will be added over the long term. They are linked through the term and are highlighted and underlined in blue. Illustrations are not included in the letter files so that these load more quickly. Images taken from older works have an abbreviated author and

title, e.g. Boulenger's "Fishes of the Nile", and, as a complete citation, can be found in the "Catalog of Fishes".

Some terms cited here are also used, or originate, in genetics, marine biology, oceanography, limnology, systematics, palaeontology, parasitology, ecology, hydrology, fisheries, museum studies, angling, aquaculture, slang, dialects of English, folklore, etymology, literature, fish processing, fish technology, fishing vessels, cooking, veterinary science, etc. and the choice of terms to include from such diverse fields is eclectic. Since it could be argued that a Dictionary of Ichthyology is not needed by a competent ichthyologist, terms from neighbouring disciplines are included for such exemplary people. These are necessarily selective, for example structures associated with nets on fishing vessels are listed but not structures that are found generally on ships. Further entry into these fields may be found through the References herein and in various online biological dictionaries at [www.biologybrowser.org](http://www.biologybrowser.org). The Palaeos website contains a vertebrate anatomical glossary at [www.palaeos.com/Vertebrates/Lists/Glossary/Glossary.html](http://www.palaeos.com/Vertebrates/Lists/Glossary/Glossary.html).

Certain areas of the English-speaking world were famous for their fisheries and these have contributed many words, e.g. Newfoundland. Other areas also have extensive vocabularies but these are in languages other than English and have not, generally, become familiar to, or used in, English, with some exceptions, e.g. Japan.

Many terms refer to a fisherman or fishermen as, at the time these terms were in common use, the industry at sea was almost entirely carried out by men. The politically correct fisher is then anachronistic and incorrect.

A list of references referred to in the text is given. Most terms are widely used and do not require documentation. This reference list is not meant to be exhaustive, nor does it track terms to their origin.

The entries are continually being refined and corrected. Corrections and new terms are welcome. A literature source for any new term is requested as documentation. Refer to [www.briancoad.com](http://www.briancoad.com) for contact information.

The [Complete Dictionary](#) comprises 3.25 MB, 23,687 terms, 517,225 words and 505 figures, as of 19 August 2010.

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<sup>†</sup> Don E. McAllister (1934-2001) - see Cook *et al.* (2001; 2002) and Cook and Coad (2002) for obituaries.

## A

A = abbreviation for acre.

A = abbreviation for anal fin (rays).

A = annual total mortality rate (the number of fish which die during a year divided by the initial number. Also called actual mortality rate, coefficient of mortality (Ricker, 1975)).

*a* or *a* = abbreviation for *annum*, meaning year. Usually used in combination, e.g. Ma, meaning million years.

A1 = abbreviation for first anal fin (rays).

A2 = abbreviation for second anal fin (rays).

A30 = number of anal fin rays anterior to the 31st vertebra, e.g. in Carapidae.

A100 = number of anal fin rays anterior to the 201st vertebra, e.g. in Nemichthyidae.

a posteriori classification = a classification made based on the results of experimentation.

a priori classification = a classification made prior to experimentation.

a- (prefix) = lacking, absence of, not, without; but see below, a-fishing.

A-B direction = in net making, the direction parallel to a rectilinear sequence of mesh bars, each from adjacent meshes.

a-fishing = in the act or process of fishing; gone fishing.

A-ft = acre-foot (one acre of surface covered with 1 foot of water (1,233,500 L, 1233.5 m<sup>3</sup>, 325,850 gal).

A-grade = a freshness grade for fish used in the European community.

a.k.a. = also known as.

aalpricken = a small eel, gutted, fried and packed in a fine edible oil (Germany).

aav(e) = the small round net by which boys pick up herrings that fall from the nets as these are being hauled in (Scottish dialect).

ab = abbreviation for aberration.

ab- (prefix) = from, away from.

abaxial = at a point away from, or distant from, the axis.

abbreviate heterocercal = type of caudal fin in which the vertebral column extends only a short way into the upper lobe of the fin (which is longer than the lower lobe); a heterocercal caudal fin approaching the homocercal type, e.g. Lepisosteidae, Amiidae.

abbreviation = a shortened form of a word or title. In zoological works genus-group names cited in binomial names of species are often abbreviated to one or two letters for convenience, e.g. *Salmo trutta* may be abbreviated to *S. trutta*, the abbreviation always being followed by a full stop (or period). The abbreviation should not be used on the first mention of a name. Similarly specific names cited in trinomial names of subspecies may be abbreviated.

ABC = allowable biological catch (a term used by a management agency which refers to the range of allowable catch for a species or species group. It is set each year by a scientific group created by the management agency and is the subjectively estimated amount of catch of a given species from a given region. The agency then takes the ABC estimate and sets the annual total allowable catch (TAC)).

abdomen = 1) the part of the body containing the viscera (intestine, liver, kidney, reproductive organs, etc).

abdomen = 2) the lower part of the body of fish, the belly.

abdominal = pertaining to the abdomen. Pelvic fins are said to be abdominal when they lie behind the posterior tip of normally developed pectoral fins.

abdominal cavity = the part of the body containing the viscera or guts, liver, ovaries, testes, kidneys, etc.

abdominal dropsy = oedema, an accumulation of excess fluid in the abdomen, causing abdominal swelling and marked protrusion of scales. Also called pinecone disease, *q.v.*

abdominal fishes = those bony fishes having pelvic fins in the abdominal position.

abdominal pore = an external aperture near the vent communicating with the abdominal cavity. Found in Cyclostomata, Elasmobranchii, and in some Teleostomi, e.g. Salmonidae.

abdominal ridge = paired dermal ridges running from pectoral to pelvic fin bases in sharks.

abdominal serra = an abdominal spine, formed from a scale in the ventral region of the fish body. A series of these serrae form a saw-like edge and their numbers can be used in identification of some Clupeidae and Serrasalmidae.

abdominal vertebra = one of the anterior vertebrae bearing ribs but lacking the haemal arch, canal and spine of caudal vertebrae, *q.v.*

abducens nerve = cranial nerve VI, innervating the lateral rectus eye muscle which rotates the eyeball laterally and the retractor bulbi muscles in part. See cranial nerves.

abduction = movement away from the medial axis of the body, or of two parts away from each other, *cf.* adduction.

abductor = a muscle that draws a part away from the axis of the body, or separates two parts.

Aberdeen cut = a cut of fish from a frozen block, rhombus-shaped with the sides often squared off or cut with a tapered edge. Usually breaded and battered. Also called diamond cut and French cut.

Aberdeen hook = a hook shape characterised by a slightly-squared round bend and a wide gape used for baiting with minnows

aberrant = adjective for aberration.

aberration = 1) a term used to denote a class of individuals within a species. A name which explicitly refers to an aberration unequivocally treated as an infrasubspecific entity is unavailable.

aberration = 2) an aberrant fish, deviating from the usual or natural type in colour, form, behaviour, etc.

abioseston = non-living components of the seston, *q.v.*

abio- = without a living, starving.

abiotic = referring to non-living structures, substances, factors, environments, etc.

abnormal = not normal; contrary to the usual structure, position, behavior or rule.

abnormal host = accidental host.

abnormality = any condition not found naturally in most fishes. Unusual conditions arising during processing fish as food are called defects, *q.v.*

aboral = opposite or away from the oral or mouth area/cavity. May be used in the sense of opposite to a biting tooth surface where this aboral end of a tooth is not a root, e.g. tooth plates in Chimaeriformes and pavement teeth, *q.v.*, in some rays, skates and sharks.

aborted name = *nomen abortivum* (a name contrary to the International Code of Zoological Nomenclature as the Code existed at the time of publication. Abbreviated as *nom. abort.*).

abortive = remaining or becoming imperfect.

abraded = worn or frayed, e.g. fins of fish after spawning.

*Abramis brama* = 1) the common bream, a cyprinid found from the British Isles across Europe north of the Pyrenees and Alps eastwards to the Black, Caspian and Aral sea basins.

*Abramis brama* = 2) a Swedish rock band that even had an album with a line drawing of the fish on it.

abruptotype = an unofficial and joke name for the type of a taxon described in haste to meet some deadline such as for a grant or project.

absolute abundance = the total number of a kind of fish in the population. Usually estimated from relative abundance as it is rarely known.

absolute conversion rate of food = an index calculated by dividing the quantity of food distributed by the extra growth believed to have been obtained only from that food.

absolute fecundity = total number of eggs in a female.

absolute growth rate = the actual increase in size of an individual, stock or population over a given time span and under specified conditions.

absolute recruitment = the number of fish which grow into the catchable size range in a unit of time (usually a year)(Ricker, 1975).

absolute synonym = homotypic synonym (a synonym based on the same nomenclatural type).

absolute tautonym = the identical spelling of a generic or subgeneric name and the specific or subspecific name of one of its originally included nominal species or subspecies.

absolute tautonymy = the action of producing an absolute tautonym.

absorptive feeding = nutrient acquisition during fish ontogeny from an ovarian secretion via flaps, trophotaenia, or trophonemata, or from the environment via body surfaces or special external gut and finfold structures.

abstracting journal = a journal which gives abstracts or summaries of scientific papers, books, theses, etc. published elsewhere.

abundance = degree of plentifullness. The total number of fish in a population, stock, other group or on a fishing ground. Can be measured in absolute or relative terms and may be number per area or per unit fishing effort.

abundance index = data obtained from samples or observations and used as a measure of the weight or number of fish which make up a stock, a segment of a stock such as spawners or in a given area. Most indices are relative units (as opposed to measuring absolute abundance), and simply indicate relative changes in abundance over time. The data is obtained from scientific surveys or inferred from fisheries data.

abyss = water below 4000 metres or 2000 fathoms (= 3660 metres), down to 6000 metres, where light does not penetrate. Occasionally used for depths below 2000 metres. A constant environment with temperatures usually 0-2°C or temperatures are uniform. From the Sumerian abzu, meaning primordial sea.

abyssal = adjective for abyss.

abyssal benthic = pertaining to the ocean floor below 400-600 fathoms (730-1100 metres).

abyssal depth = see abyssal for oceans; in fresh water it may mean the maximum depth or the depth at which water temperature remains uniform.

abyssal floor = abyssal plain.

abyssal plain = the area of the generally flat ocean floor excluding ocean trenches below 2000 fathoms (3660 metres, presumably an older version based on fathoms) or 4000 metres.

abyssal zone = the middle zone of the deep sea between 3700 and 6000 metres.

abyss- (prefix) = bottomless.

abyssalpelagic zone = the abyssopelagic area of the ocean.

abyssobenthic = the depth zone of the ocean floor between 4000 and 6000 metres, or from about 3700 m downward, or below the 4°C isotherm.

abyssopelagic = living in the water column at 4000 to 6000 metres (or 2500-4000 metres, or 4000-7000 metres, sources differ), seaward of the continental shelf-slope break. See also abyssalpelagic zone.

AC = a series of ventro-lateral photophores extending between a vertical at the anal fin origin and the end on the caudal peduncle. The AC row may begin posterior to the anal fin origin if it is offset from other ventro-lateral photophores.

ac = abbreviation for acre.

ac ft = acre-foot.

acantho- (prefix) = with spines.

acanthoid = spiny or spine-like.

acanthotrich = a spiny dorsal or anal fin ray.

acanthotrichia = plural of acanthotrichium.

acanthotrichium (plural acanthotrichia) = acanthotrich.

acanthostedion = postlarval stage of the Peristediidae characterized by long parietal spines and development of rostral exsertions.

acaudal = lacking a tail.

acceptable biological catch = subjectively estimated amount of catch of a given species from a given region. The sustainable harvest used to set the upper limit of the range of potential annual total allowable catch. Also called allowable biological catch.

acceptable catch estimate = an approximate estimate of the catch of a given species that could be taken from a stock in a given region. Also called allowable catch estimate.

acceptable impact = a negative, or potentially negative, alteration of the fishery resulting from human activities. The impact is acceptable since it represents a low risk to the resource. As it is under continuous review, it may be revoked.

acceptable name = 1) a name in accordance with the Code of Zoological Nomenclature.

acceptable name = 2) an established name that is not a (non-conserved) later homonym and thus may potentially be an accepted name (*q.v.*).

accepted = a scientific manuscript that has been through the peer review process, revised, approved for publication by the editor of the journal, and is ready to be sent to the printer or website. The date when the manuscript was accepted often appears in the printed or online version.

accepted name = 1) a name adopted by an author as the correct name for a taxon where names are in dispute.

accepted name = 2) the acceptable name (*q.v.*) that must be adopted under the rules of the Code of Zoological Nomenclature.

access = 1) the means by which a person enters a water body, usually with a boat.

access = 2) access right.

access right = the authorisation given to a user, e.g. a vessel owner, by a fishery management authority or by legislation, to exploit a resource, a particular species, or a share of a total allowable catch. Access rights may be free of charge or require payment and are usually conditional and used under constraints specified in a management plan.

accessibility = the condition of fish occupying a locality where they can be caught using the appropriate gear.

accession = 1) the formal acceptance into museum custody of a specimen or a collection of fishes, and the recording of such.

accession = 2) a specimen(s) acquired by a museum for its permanent collection.

accession = 3) the act of recording and processing an addition to a permanent collection.

accession list = a document in which accessions are recorded, usually chronologically by date of receipt; may be a bound volume and/or a computer file.

accession number = a unique number assigned to an accession, usually sequentially in chronological order of receipt.

accessioning = accepting legally a fish collection, containing one to many specimens and species, with date of receipt, ownership, donor, etc.

accessory breathing organ = labyrinth organ (a much folded suprabranchial accessory breathing organ found in Anabantoidei. Formed by vascularized expansion of the epibranchial of the first gill arch. Used for respiration in air).

accessory caudal ray = one of a series of short, procurrent rays on the upper and lower margins of the caudal peduncle.

accessory dorsal branch = a lateral line branch found in some flatfishes, running from the head for varying lengths below the base of the dorsal fin.

accessory growth centre = a growth centre outside the core of the fish otolith from which new growth may occur. May result from metamorphosis. Also incorrectly called accessory primordia.

accessory lateral line = accessory dorsal branch.

accessory male = a male fish which attempts to fertilise eggs of a breeding female at the expense of a dominant male.

accessory olfactory sac = olfactory ventilation sac (an extension of the olfactory cavity, often characteristic of inactive bottom dwellers living in still water such as flatfishes, dipnoans, and eels but also found in clupeids, salmonids, mugilids and scombrids. Primarily used for ventilation but also produce mucus. There may be up to four sacs, usually the additional sacs are smaller but in Osmeridae the sole accessory sac is larger than the main sac).

accessory pectoral scale = accessory scale.

accessory pelvic appendage = a tapered fleshy lobe above the base of the pelvic fin. May be covered by a scale.

accessory primordium = an additional growth centre outside the otolith core but lacking primordial granules. Accessory growth centre is preferred.

accessory respiratory organ = a superficial or internal organ which complements the gills in exchange of gases with the environment when the fish is in poorly oxygenated water or in air. In some cases it may also function as a hydrostatic organ.

accessory scale = axillary scale (a small triangular appendage or a modified scale at the upper or anterior base of a paired fin. Also called fleshy appendage and inguinal process. Functions apparently to streamline the fin when held against the body while swimming).

accidental catch = other fishes caught during a fishery directed to a target species. The fish may be taking bait meant for other fish, chasing the target species or are swept up by the gear used. Also called incidental catch or by-catch.

accidental host = a fish serving as a host for a variable length of time for a parasite of another animal. Also called abnormal host.

accidental parasite = a parasite which has infected an unusual host.

accidental species = normally marine species occasionally found in fresh waters but not in any regular or predictable manner. Records are usually few.

acclimation = the process by which fish become used to new circumstances. Often used in adjusting to changes in temperature, water quality, lighting regimes, being netted, etc. in aquaculture or aquaria. Fish may be more susceptible to pathogens and eat poorly while acclimating.

acclimation pond = a pond or temporary structure used for rearing juvenile fish, acclimating them to specific conditions and, for migratory fish, imprinting the water of a particular stream.

acclimatisation = adaptation to a new environment by a population by selection.

Acclimatisation Society = an organisation in Australia in the mid-nineteenth century set up to introduce familiar European species, e.g. roach, *Rutilus rutilus*, a cyprinid.

acclivous = having a gentle upward slope.

accommodation = changing the focus of the eye; in fishes the lens moves back and forth in relation to the retina like a camera.

accumulated lethality = F-value (in food inspection, the total lethal effect of heat applied; the time/temperature process at the cold spot of the product. The value is expressed as equivalent minutes at a specific reference temperature (Tref) and a specific z-value, e.g. F (Tref = 65°C, z = 6.7 C°) = 5.9 minutes).

acentrous = without vertebral centra, with persistent notochord, e.g. Dipnoi, Holocephali.

acequia = an irrigation ditch or canal, often community run (southwest United States).

acetic acid = an organic acid, CH<sub>3</sub>COOH, used in diluted form in preparation of fish marinades, q.v.

achondral bone = dermal bone (any of the superficial bones in Teleostomi derived from the dermis and overlying the deeper elements of the skull. Primitive fishes have more dermal bones than higher ones, e.g. the armour of Ostracoderma. Dermal bones are a form of membrane bones, i.e. they arose directly from connective tissue membranes without the cartilaginous precursors which precede endochondral bones. They may be divided into laterosensory canal bones that develop in relation to the sensory canals, bones derived from mesenchymous tissue and anameric bones (q.v.). Also called covering, membrane and investing bones).

achyliasis = an external fungal infection of fishes, genus *Achylya*.

aciclar = needle-shaped.

aciculate = needle-like.

acid curing = marinating or preparing a marinade (a marinade is acidified brine, acetic acid, olive oil or vinegar with or without spices in barrels or special containers in which fish are soaked. The cured fish are packed in mild acidified brine variously with spices, sugar, wine, vegetables and flavourings, e.g. rollmops, Bismarck herring. Salt helps firm the flesh. Chilled marinades have a shelf life of 1-2 months, canned marinades much longer. The pH must not exceed 4.5 as below this spoilage does not occur and food poisoning bacteria do not grow. However some bacteria and enzymes are active and aid ripening, contributing to texture and flavour. Cold marinades are preserved by their acid and salt content, cooked marinades by this and by heat or pasteurisation).

acid death point = the pH at which fish die from acidity of water, usually about pH 4.0.

acid deposition = the addition of acidic material to the ground or water, usually from sulphur and nitrogen compounds emitted by factories and deposited far from this source. Wet deposition is also called acid rain, *q.v.*, and is the result of rain, snow or fog while dry deposition results from particle fallout or acidic gases.

acid detergent fibre = the carbohydrates in an aquaculture feed that are not solubilised by acid detergent. This plant material is not easily used by fish. Abbreviated as ADF.

acid lake = any lake with a pH less than 6.0.

acid neutralising capacity = the property of water that reacts with an acid; formerly alkalinity. Abbreviated as ANC.

acid pickle = an acid solution for curing or marinating fish.

acid rain = rain falling through an atmosphere containing sulphur dioxide and nitrogen oxide pollutants thus making the rain acidic (pH less than 7.0); in lakes without the ability to neutralise the acid survival of fish eggs and young is compromised. Also referred to as acid deposition and wet deposition.

acid-cured fish = fish preserved or marinated in acidified brine with or without spices.

acidic stress index = a function of pH, calcium and inorganic monomeric aluminium conditions in natural waters; used in fish toxicity models.

acidity = a measure of the hydrogen ion concentration, a pH less than 7.0, or the quantitative capacity to neutralise a base to a designated pH.

acidophile = fish from acid waters, like the Amazon and forest pools in West Africa, preferring a pH below 7.

acidophilous = having an affinity for or thriving in acidic conditions, e.g. in a bog or marsh. Also called acidophilic.

acidotrophy = waters where the hydrogen ion concentration is high, producing highly acidic reactions, and in which humic material is lacking.

acinaciform = slender sword, of scimitar-like form, e.g. acinaciform branchiostegal rays in Perciformes.

acini = plural of acinus.

acinus (plural acini) = a lobule of a secretory gland formed by a group of exocrine glandular cells, e.g. in the pancreas.

acipenserin = a toxic substance reputedly obtained from the gonads of sturgeon, *Acipenser*.

acker = the break or movement made by a fish in the water (English dialect).

acmic = referring to periods of seasonal change in an aquatic population.

acoustic = concerned with hearing or sound.

acoustic bait = a device making sounds or vibrations used to attract fish, e.g. shark rattles, *q.v.*, beating the water surface, spraying the water surface with hoses in the tuna line fishery, croakwood, *q.v.*, bells, etc.

acoustic device = 1) an acoustic harassment device.

acoustic device = 2) a pinger (a sound-emitting device. Attached to static nets to discourage dolphins and porpoises from their vicinity so that the mammals do not become entangled).

acoustic fish tag = a transmitter implanted or attached to a fish to monitor fish movement.

acoustic harassment device = an underwater device that generates sounds to deter marine mammal predators from salmon farms.

acoustic survey = a method of gathering information on fish availability and abundance by using echo sounders and sonar.

acoustic tag = a sound transmitter attached to a fish.

acoustico-lateralis system = the sensory system consisting of the lateral line and the inner ear.

acquisition = transfer of title for a specimen(s) to a museum. Acquisitions may be gifts, purchases, bequests, exchanges or the results of field work.

acre = 4046.9 m<sup>2</sup>, 0.405 ha, 43,560 ft<sup>2</sup>, 4840 yd<sup>2</sup>, 0.00156 mi<sup>2</sup>. There are 640 acres in a square mile. The metric version is the hectare, *q.v.*

acre-foot = one acre of surface covered with 1 foot of water (1,233,500 L, 1233.5 m<sup>3</sup>, 325,851 gal.). Used to measure volumes of water used or stored, such as in reservoirs. Abbreviated as ac ft or af in the U.S.A.

acriflavin = a chemical used in aquaria to combat protozoan and fungal infections and to disinfect fish eggs. It is orange or brown in colour and is a dye which stains the skin. Also spelled acriflavine.

acrodin = tissue forming a cap on teeth found in ray-finned fishes.

acrodont = type of tooth ankylosed to the jaw along the midline of the jawbone, rather than to the inner edge, the condition in most fishes. Attachment is by connective collagenous tissue with impregnated calcium salts and, in maxillary and mandibular teeth, by a bony piece between the tooth and the bone.

acronurus = postlarval stage of Acanthuridae.

acronym = any abbreviation using the initial letters of the words abbreviated. Museum collections of fishes are catalogued with an acronym and a number; these acronyms are listed in Leviton *et al.* (1985) and Leviton and Gibbs (1988).

acrosome = a cap over the nucleus of spermatozoan heads having enzymes involved in sperm penetration of the egg and possibly fusion of egg and sperm. Absent in most Teleostei.

acrylic = a plastic material used in aquaria construction and for aquarium accessories such as filters.

act, nomenclatural = a published act which affects the nomenclatural status of a scientific name or the typification of a nominal taxon; available nomenclatural act is one that is published in an available work; invalid nomenclatural act is any nomenclatural act which is not valid under the provisions of the International Code of Zoological Nomenclature; unavailable nomenclatural act is one published in an unavailable work; valid nomenclatural act is one that is accepted under the provisions of the Code, i.e. the earliest available act not contravening any provision of the Code.

actiniariophil = a reproductive guild (*q.v.*) where adhesive eggs are deposited in a cluster at the base of a sea anemone. Parents guard the eggs and coat them with mucus as protection against nematocysts. Free embryos are phototactic, planktonic and early juveniles select the host anemone, e.g. *Amphiprion allardi*.

actic = pertaining to rocky shores; between the low and high tides; intertidal; littoral.

actinic = a type of lighting used in aquaria. It provides the blue end of the spectrum for photosynthesis.

actinophore = the pterygiophore(s) and the associated fin ray.

actinost = one of a series of endochondral bones in the pectoral and pelvic girdle on which the fin rays insert. Most teleosts lack or have greatly reduced pelvic actinosts. Teleosts have one row of actinosts between the fin rays and supporting skeleton (coracoid and scapula for the pectoral, basipterygia for the pelvic) while other fishes may have more rows, referred to as radials.

actinotrich = a slender, horny, flexible, unsegmented fibril which strengthens the embryonic fin fold and which may persist in the outer edge of the adult fin membrane or in the adipose fin. It develops intercellularly rather than cellularly. Persists in fins of Elasmobranchii, Holocephali, and sometimes in Teleostomi distal to the lepidotrichia that replace them. Actinotrichia are translucent, exhibit birefringence (double refraction) and are composed of a scleroprotein called elastoidine. They may be homologous with ceratotrichs found in cartilaginous fishes because of their horny or keratinous nature.

actinotrichia = plural of actinotrichium.

actinotrichium (plural actinotrichia) = actinotrich.

action = 1) the performance of a fishing rod while fighting a fish. Measured as the time elapsed between flexion and a return to a straight configuration. Action can be slow (the most flexion, 90% of the rod bends) to fast (30% of the rod bends); also referred to as stiff, parabolic, etc. May also refer to the rod strength, a light rod being limber and a heavy rod stout.

action = 2) the gear of fishing reels.

action = 3) the movement and performance of a fishing lure in the water.

action = 4) when fish are biting.

action = 5) dragging a fishing fly across the current resulting in an unnatural drift.

activated carbon = pure carbon in porous form used in aquaria to adsorb dissolved organic matter, chlorine, and yellowing compounds (and hence in the latter case keeps water clear). Must be changed regularly as it clogs and can release phosphates into the water which promote algal growth.

activated charcoal = activated carbon.

active = fish intent on feeding. Also called positive.

active capture gear = equipment used in active fishing, such as trawls.

active fishing = fishing with gear that is not stationary, e.g. trawls.

active forager = a predator that actively seeks its prey, *cf.* ambush predator.

activity coefficient = ratio of the metabolic activity of a fish at rest with that at maximum activity.

actomyosin = a combination of actin and myosin, the two main proteins in all fish muscles.

actophilous = thriving on rocky shores.

actual mesh size = stretched mesh size of a net as determined by a standard process such as use of a mesh gauge, *q.v.*

actual mortality rate = annual mortality rate.

aculeate = bearing a sharp point.

aculeiform = needle-shaped, e.g. pipefishes.

acuminate = tapering gradually to a point, e.g. the tail of Anguilliformes.

acute = 1) ending in a sharp point

acute = 2) running a short and intense course as in toxicity or inflammation.

acypriniod zone = those regions lacking Cyprinidae - South America and the tropical Pacific Islands approximately east and south of Wallace's Line including Australia.

A.D. or AD = abbreviation for *anno domini*, or Year of the Lord, the Christian dating system. Common era or CE is used as a neutral version.

ad. = abbreviation for adult.

ad hoc = for the specific purpose, case or situation at hand and for no other.

*ad int.* = *ad interim*, meaning for the present, provisionally.

ad libitum = to the limit; often meaning fed until satiated.

*ad muraenas* = ponds for the culture of moray eels were common in Roman times and a punishment for recalcitrant slaves was throwing them in these pools as food for the morays.

ad- (prefix) = to, on the side of, toward.

Adam's special = an artificial dry fly used to imitate an adult mayfly.

adaptation = the process (or its results, e.g. a structure) wherein individuals, populations or species change to cope with their environment or changes in that environment.

adaptive management = a management process involving feedback to test performance and perhaps deliberate intervention to test the fishery system's response.

adaptive radiation = speciation of a taxonomic group to fill numerous previously vacant ecological niches, e.g. Cichlidae in the Great Rift Lakes of Africa, Cottidae in Lake Baikal of Russia.

adaxial = the paraxial mesoderm subregion developing just adjacent to the chorda mesoderm or notochord rudiment.

added-value = processing of fish before export.

addersteean = adderstone.

adderstone = a stone (grey alum shale) with a hole through it, hung on fishing boats as a charm. Old spindle-whorls, reputedly made by adders (an English venomous snake).

adderstyen = adderstone.

additional catch = supplementary catch obtained either on purpose or by accident.

additional material = specimens other than those in the type series; these may be used to describe a new species but have no nomenclatural significance.

additive = any chemical added to fish for stability during storage, prevention of bacterial growth and toxin production, for colour and appearance to consumers, retention of moisture, prevention of off-flavours, etc. Additives include salt and ascorbic acid which are naturally present in foods and also other chemicals whose use is regulated.

adduction = movement towards the medial axis of the body, or of two parts together, cf. abduction.

adductor (plural adductores) = a muscle that brings one body part towards another.

adductor mandibulae = a muscle of the cheek area which acts to close the mouth and compress the lips. It is divided into four parts in the perch (*Perca flavescens*): part 1 has its origin on the dorsal half of the vertical arm of the preopercle and inserts at the centre of the maxillo-mandibular ligament (q.v.). It is a large muscle below the eye. A third part of the ligament serves as an origin for the fourth part of the muscle. Part 3 originates on the pterygoid bone and inserts with part 2 on the maxillo-mandibular ligament beneath the insertion of part 1. Part 2 is a large muscle below part 1. Part 4 originates on the internal portion of the maxillo-mandibular ligament and inserts on the ventral, internal part of the dentary and so is on the lower jaw.

adductor operculi = a muscle originating from the pterotic bone posterior and medial to the origin of the elevator operculi and inserting on the dorso-medial surface of the operculum ventral to the insertion of the levator operculi.

adductores = plural of adductor.

adelph- (prefix) = brother.

adelfophagy = feeding on retarded siblings within the uterus, e.g. *Lamna nasus*, *Odontaspis taurus*, *Latimeria chalumnae*, a form of uterine cannibalism. Also spelled adelphophagy.

adelfotype = an unofficial term in nomenclature referring to a topotype (q.v.) collected by the original collector of a taxon but one not forming part of the type series.

adelphophagy = adelfophagy.

adelphotaxa = sister taxa.

adeno- (prefix) = gland.

adenohypophysis = part of the pituitary organ of the lower brain involved in hormone control.

adenoid organ = a lymphoid structure in the lining of the oesophagus of Elasmobranchii.

adequate diet = balanced and fully sufficient feed in aquaculture or nature.

ADF = acid detergent fibre.

adfluvial = 1) living in lakes and migrating into streams to spawn; juveniles feed in streams but migrate to lakes as subadults for feeding.

adfluvial = 2) pertaining to flowing water.

adherent = attached (firmly); sticking; connected with. Said of scales that do not detach easily, for example.

adhesion = connective tissue growth within and around an organ causing it to attach to the peritoneal or pericardial walls. Usually results from inflammation or parasite infestation.

adhesive = 1) sticking, as in eggs to the substrate or to other eggs.

adhesive = 2) sticking, as in structures used in attachment by fishes.

adhesive disc = adhesive disk.

adhesive disk = a sucker-like organ for clinging to various surfaces, e.g. the modified pelvic fins in Gobiescoidae and Liparidae, and the dorsal fin in Echeneidae. Also spelt adhesive disc and used for the adhesive organ.

adhesive egg = a fish egg that is deposited on sand, gravel, plants, etc. to which it sticks by means of the egg's sticky surface. In aquaculture situations this is inconvenient and the adhesiveness can be removed by milk or tannin.

adhesive head gland = adhesive organ.

adhesive organ = transient larval organs near the mouth used to attach the larvae to the substrate, e.g. in *Protopterus*, *Lepidosiren*, *Acipenser*, *Esox*, *Macropodus*.

adipocyte = a fat cell.

adipose = fat.

adipose clip = removal of the adipose fin in a hatchery-reared fish, indicating that it contains a coded-wire tag, q.v.

adipose eyelid = transparent membrane(s) over the anterior and posterior regions of the eye, e.g. in Scombridae, Clupeidae, Albulidae, Mugilidae. It serves for streamlining and protection and may cover much of the eye except for a small central opening.

adipose fin = a small fleshy fin lacking rays or spines but reinforced by actinotrichs posterior to the soft dorsal fins (rarely a hard ray or a few soft rays may be developed in the adipose fin of certain catfishes), e.g. in Salmonidae, Osmeridae, Argentinidae, Myctophidae, Ictaluridae, Percopsidae.

adjuvant = material added to a vaccine to enhance the immunological response.

admiral = 1) the master of the first English fishing vessel to reach a cove or harbour in Newfoundland, exercising certain privileges for the season.

admiral = 2) the master of an English fishing vessel, chosen weekly to exercise jurisdiction over European fishermen in a Newfoundland harbour.

admiral = 3) the fisherman who is in charge of the herring fleet (Manx).

Admiralty pattern anchor = the standard pattern of anchor, *q.v.*, comprising two flukes (which dug into the sea bed), a shank and stock. In the eighteenth century a collapsible stock was introduced for easier storage.

admissible = the form of a name which can be validly published and the use of a name or epithet in accordance with the provisions of the International Code of Zoological Nomenclature.

adnasal bone = a small dermal bone in front of the nasal bone in some fishes, e.g. the middle bone of three in the nasal region of *Lepisosteus*. Also called nasal bone.

adnate = closely attached to, joined along whole length without a free tip; conjoined; adhering, e.g. adipose fin in *Noturus* (Ictaluridae).

adnate eye = an eye joined by a membrane to the orbit.

adnexed = unattached, with a free edge, not united, flag-like e.g. the adipose fin in salmonids. Opposite of adnate.

adopt = to use an unavailable name as the valid name of a taxon in a way which establishes it as a new name with its own authorship and date.

adoral = close to the mouth.

adpressed = pressed flat against the body; appressed.

adrenal gland = absent in fishes but said to be present in sculpins (Cottidae). Interrenal cells associated with major blood vessels in the anterior kidney represent adrenal cortical tissue in fishes. Adrenal medullary cells are associated with sympathetic ganglia in clumps between the anterior kidney and spine or in the interrenal tissues.

adrenalin = a hormone causing the flight or fight behaviour in response to a sudden stress.

adrenaline = adrenalin.

adspersed = widely scattered or distributed.

adtidal = living immediately below the low tide level.

adult = a sexually mature animal; a fish that has reached the length or age of first maturity.

adult equivalent population = the number of fish that would have returned to an area, such as an estuary, in the absence of any prior harvest.

adult fish count = a count of adult fishes passing by a fish-viewing window. Such windows can be placed at the upstream end of fish ladders on dams. Observers count the number of fish according to pre-set criteria, e.g. by species and size, for 50 minutes of every hour for 16 hours per day. Extrapolations can then be made for times when fish are not observed. Separate counts can be made for adults and jacks (precocious male salmonids that can be identified by their smaller size).

adult habitat = an area that provides the necessities of life for an adult fish (angling).

adult period = this period begins with the first maturation of gametes and is characterised by spawning, either annually or only once, and by a slowed or arrested growth rate.

adult stock = spawning stock (the mature part of the stock that is able to spawn; the number or biomass of all fish beyond the age or size class in which 50% of the individuals are mature).

*adv.* = *advena*, alien, introduced.

advanced = derived (a character or character state not present in the ancestral stock; apomorphic. The term should not be applied to organisms or taxa since they are a mix of plesiomorphic and derived character states).

advanced fry = a larval fish that has absorbed the yolk, correctly postlarva.

*advena* = alien, introduced. Abbreviated as *adv.*

adventitious = accidental, occurring at an unusual locality, as in an adventitious visitor.

adventive = an introduced species not yet established in the wild.

adventure = a commercial fishing enterprise. Also called venture.

adventurer = 1) a migratory English fisherman operating seasonally in Newfoundland (archaic).

adventurer = 2) a resident fisherman who fishes seasonally in coastal waters distant from his home port in Newfoundland.

advertisement = bright colours and conspicuous patterns shown by fishes. Used to indicate unpleasant taste, venom, sex and mood (paling when frightened, darkening when sexually excited).

advisory = a note addressed to the public when high concentrations of chemical contaminants have been found in local fish.

aeration = introduction of air into water.

aerator = 1) an air pump used to oxygenate aquaria.

aerator = 2) a battery-operated pump used to oxygenate water in a bait bucket by anglers.

aerator = 3) a device to oxygenate water in an aquaculture facility.

aerial fishing = the use of aerial traps (*q.v.*) to catch fish.

aerial redd survey = a method used to estimate numbers of spawners in a river by counting the number of redds visible from an airplane.

aerial stocking = releasing fish into a water body from a plane or helicopter. Usually fry are stocked in this way.

aerial survey = a method of gathering information on fish shoal movement and density by visual observation and photography from low-flying aircraft.

aerial trap = a trap used to take jumping fish, e.g. mullets and flyingfish. Fish are caught on the surface in boxes, rafts, boats and in such nets as veranda nets. The fish may be frightened into jumping out of the water.

aero- (prefix) = air.

aerobi- (prefix) = living in air.

aerobic pond = a shallow pond, 0.3 m deep, in which photosynthesis is at a maximum, aerobic conditions are maintained and wastes are processed by microorganisms.

aerofoil = modified pectoral and pelvic fins used for gliding.

aerophil = 1) a reproductive guild (*q.v.*) of a terrestrial spawner characterised by small adhesive eggs scattered over damp sod, by not being photophobic and having moderately developed respiratory networks, e.g. *Brycon petrosus*.

aerophil = 2) a reproductive guild (*q.v.*) of a terrestrial spawner where adhesive eggs are tended after deposition on the underside of structures above the water surface by the male splashing them. The embryos have cement glands, e.g. *Copeina arnoldi*.

aeropsammophil = a reproductive guild (*q.v.*) where eggs are hidden on a beach. Spawning occurs above the high tide mark and eggs and embryos hatch at the next high tide when surf action gives the cue, e.g. *Leuresthes tenuis*.

aesthetic fishing = capturing fish for display or other appreciation, not for food, sport or industrial reasons, cf. anaesthetic fishing.

aestival = of or pertaining to the early summer.

aestival pond = 1) a pond containing some water throughout the year but freezing to the bottom in winter, thus supporting only a temporary fish fauna.

aestival pond = 2) a pond existing only in summer.

aestivation = dormancy during the dry season or summer, e.g. in Dipnoi. Also spelled estivation.

af = acre-foot.

*aff.* = abbreviation for *affinis* (related to but not identical with, affinity, relationship, sometimes misleadingly employed as a synonym for phenetic similarity (or akin to)).

afferent = leading towards.

afferent branchial arteries = those arteries that receive blood from the ventral aorta, extending along the gill arches and sending capillaries into the gill filaments where they join branches which become the efferent branchial arches and so are involved in gaseous exchange.

*affinis* = related to but not identical with, affinity, relationship, sometimes misleadingly employed as a synonym for phenetic similarity (or akin to).

affluent = a stream or river that flows into a larger one or to a standing water body; a tributary; influent, although this may be restricted to a lake having a single inflowing stream (or influent).

afin = *affinis*.

aflaj = plural of falaj, a term for a qanat in the Arabian Peninsula (an underground water channel constructed in alluvial fan material to tap the water table and provide a constant flow of water. Mostly found in the Middle East and a habitat there for fishes. Called karez in central Asia and Afghanistan and foggara in North Africa).

aflatoxin poisoning = a mould-based poison or mycotoxin found in some dried aquaria foods kept under warm and damp conditions. Fish exhibit poor growth and anaemia and may die. The mould species involved are *Aspergillus* spp.

affluvial = adfluvial.

AFO = number of vertebrae anterior to the anal fin origin, e.g. in larval fishes.

after gibb = to gibb (*q.v.*) herring after they have been salted in the round.

afterbay = the tail race or reservoir of a hydroelectric power plant at the turbine outlets.

agamy = the condition where no lasting bond is formed between a spawning pair, the male and female separating after spawning, e.g. in some Cichlidae.

agape = with jaws open; gaping.

agastric = lacking a stomach. Some fishes, such as herbivorous Cyprinidae, lack a true stomach.

age = the number of years of life completed. In fisheries indicated by a numeral, e.g. age 5 or age V. Since any fish is only age 5 for a moment, the numeral is often followed by a plus sign to indicate the year of life, e.g. 5+ is a fish in its sixth year of life. Freshwater and saltwater age can

be indicated by a period, e.g. 2.3 represents 2 winters in fresh water (not counting the incubation period for fish eggs that overwinter) and 3 years in salt water.

age at first capture = the age at which fish are first caught commercially.

age at first maturity = mean or median age at first maturity when 50% of a cohort spawn for the first time.

age at recruitment = the age at which fish are recruited to a fishable stock.

age class = individuals of a given (same) age within a population, e.g. all four-year-olds. Usually given in years but may be shorter periods, particularly in the tropics. The age class changes every year in contrast to year class which is always the same, e.g. a fish born in 1995 will always be in the 1995 year class but in 1998 will be in age class three. Also called cohort.

age composition = the proportion of different age groups of fish in a population or in a catch. A healthy population has a wide range of age groups.

age determination = the age of fish may be determined by counting the annual rings on a scale (by microscopic examination, projection of the scale or its celluloid imprint with a scale projector, or projecting a photographic negative of the scale), or in bony parts such as vertebrae, otoliths, opercular series of bones, pectoral spines; by the known age method (growing fish in ponds or tagging fish in the wild and recapturing them at intervals); by the length frequency method (the different age groups tend to be different lengths apparent when the sizes are grouped in a length frequency graph, from which age may be deduced). Age estimation is often a preferred term because of uncertainties in ageing methods.

age distribution = the number or percentage of individuals in each age class of a population; age structure.

age estimation = age determination.

age frequency = a breakdown of the different age groups of a kind of fish in a population or sample. Also called age structure.

age group = a group of fishes of a given age, e.g. a fish born on 1 May is in age group 0 until the same date in the subsequent year when it enters age group 1 (or I), a year later age 2 (or II), etc.

age of fishes = the period of time in the earth's history dominated by fishes - the Silurian and Devonian periods.

age of maturity = the age when 50% of the fish of a given sex are considered to be reproductively mature.

age of phase inequality = age of tide.

age of recruitment = the age when fish are considered to be recruited to the fishery, i.e. become vulnerable to the fishing gear. In stock assessments, this is usually the youngest age group considered in the analyses, typically age 0 or 1.

age of tide = the time interval between new or full Moon and the maximum effect of these phases upon range of tide or speed of the tidal current.

age specific = the dependence of a factor, such as fishing mortality, on the age of fish.

age specific fecundity = fecundity or egg potential related to age.

age specific mortality = mortality expressed as a function of age.

age specific survival rate = the average proportion of individuals in a particular age group that survive for a given period.

age structure = the number or percentage of individuals in each age class of a population.

age validation = confirming that annual growth rings on bony parts do conform to a year's growth.

age-cohort analysis = the proportion of each age-group participating in an activity currently used to predict the future sizes of each age-group.

age-group = a term denoting the age in years of a fish, or the number of calendar years in which it has existed, as I, II, III, etc; the cohort of fish of a given age, e.g. the five-year-old age-group. Unfortunately a standard definition has not been established.

age-length composition = age-length key.

age-length curve = a curve showing the relationship of age and length, a simplified form of an age-length key.

age-length key = a method of assigning ages to fish, given length measurements. Used to convert catch-at-size data into catch-at-age data. The keys specify the probability that fish of a given size belong to one of several age groups.

age-slicing = cohort slicing (a method used to assign ages to fish, given length measurements, e.g. used to convert catch-at-size data into catch-at-age data before the application of age-structured assessment models. Cohort slicing assumes that there is a one-to-one correspondence between length and age, i.e. the approach ignores individual variability in growth).

age-structured assessment = an assessment of the status of a fish stock, based on the relative abundances of fish of different ages in the stock.

age-structured production model = a stock assessment programme based on a deterministic form of a stock-recruitment relationship, with non-equilibrium tuning of abundance indices. Abbreviated as ASPM.

ageing = the process of determining the age of a fish or population of fishes. A fish that is less than 1 year old (counted from time of spawning by its parents) is a subyearling, or zero-age. A yearling fish is more than 1 year and less than 2 years old. Ages may be expressed as years or as

year with a + sign, e.g. 3+ is a fish in its fourth year of life. Strictly, this term should be used only for the process of becoming older and the associated changes in an individual.

ageing technique = a method of determining the ages of fish, most often done by counting rings in hard parts of the fish body, such as otoliths, scales, opercula or vertebrae.

agent = the representative in a fishing settlement of a St. John's fish merchant.

agger = double tide (a high water consisting of two maxima of nearly the same height separated by a relatively small depression, or a low water consisting of two minima separated by a relatively small elevation).

aggregate = a group of species, other than a subgenus, within a genus, or a group of species within a subgenus, or a group of subspecies within a species. The aggregate can be indicated by a species-group name interpolated in parentheses.

aggregated fishery data = pooled data. Such data is compiled so that confidential or proprietary data, e.g. on detailed fishing activities of individual fishers or vessels, cannot be determined either from the present release of the data or in combination with other releases.

aggregating device = artificial or natural floating objects placed on the ocean surface, often anchored to the bottom, to attract several schooling fish species underneath, thus increasing their catchability. Used with tuna, for example. Also called fish attracting device. Abbreviated as FAD for fish aggregating device.

aggregation = 1) a group of fishes in close proximity, usually of the same species, most of which are not oriented or moving in the same direction, usually responding independently to a common stimulus, e.g. food; as opposed to a school, *q.v.*

aggregation = 2) a group of populations that make up a stock for management purposes.

aggression = behaviour meant to intimidate or damage another fish or other organism. Aggression is used to protect territory, young or to establish dominance. Predatory behaviour is not aggression.

aggressive mimicry = mimicry involving at least three species. A predator resembles a non-aggressive species such as a cleaner (*q.v.*) and thus can attack misled clients who think they are about to be cleaned.

aggressor = in aquaria, a fish which attacks others as food or in defence of territory.

agglomerular = without glomeruli (*q.v.*). An agglomerular kidney lacks capillaries which filter water and waste from the bloodstream. Found in some Gasterosteiformes.

agonistic behaviour = interactions between members of the same species involving threat, aggression, appeasement, avoidance and retreat; social interactions.

agreement = in taxonomy referring to gender between a generic name and a species or species-group name combined with it, e.g. *Nemacheilus rhadinaeus* becomes *Paracobitis rhadinaea* as the genus changes from masculine to feminine.

agriotype = 1) an unofficial term in nomenclature for an ancestral type.

agriotype = 2) an unofficial term in nomenclature for a wild taxon thought to be the ancestor of a domesticated one.

"Ah fishsticks!" = an expression used on the TV cartoon *South Park* in place of swear words by Leopold "Butters" Stotch, the most innocent and gullible character.

aiker = 1) acker.

aiker = 2) chopped shellfish and other bait thrown into the water to attract fish when fishing from a pier or rock (Scottish dialect).

aimed fishing = fishing directed at a particular, identified group of fishes, such as a school located by sonar.

Ainu dog = the Ainu of northern Japan taught their dogs to catch migrating salmon. The dogs are also called Hokkaido inu.

air bladder = gas bladder, the preferable term since the composition of gases may not be identical to that of air (a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Composed of three layers, the tunica externa, the submucosa or middle layer and the tunica interna, all q.v. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, sound receptor, respiratory organ. Often lacking in bottom fishes. Sometimes called swim bladder, also a less appropriate term. An item in Chinese cuisine. Used to make isinglass, q.v.).

air blast chilling = cooling fish product with a blast of cool air to a temperature just above 0°C.

air blast freezing = freezing fish product with high velocity cold air to -35°C.

air boat = a boat with a very shallow draft, powered by an aircraft engine turning an air propeller. Used by anglers.

air breathing fishes = a general term for those fishes that can use atmospheric oxygen by means of an accessory respiratory organ, in addition to their gills. Includes fishes in the Clariidae, Channidae, Belontiidae, Osteoglossidae and the lungfishes (Dipnoi).

air bubble curtain = air curtain (1) and (2).

air curtain = 1) air bubbled through perforated pipes as a barrier to fish movement.

air curtain = 2) air bubbled through perforated pipes laid along the sea floor, forming a curtain of bubbles and a path which fish follow or are directed into a stop seine enclosure.

air embolism = gas bubble disease (supersaturated gases (>115-125%) in water entering the body fluids of fish causing bubbles, an embolism. Often seen in gills, eyes, skin and yolk sacs where membranes are the most gas permeable. Fish often swim upside down or vertically, sometimes looking as if they are gasping for air at the surface and may have exophthalmia. Found below power plants in winter when cold water is rapidly heated by passing through condensers, in hatcheries using borehole water and in aquaria when fresh cold water is rapidly heated).

air hole = an opening in the frozen surface of a water body.

air lift = a device that inserts air into water at depth, displacing both upwards. Used in aquaculture to remove fish from cages for harvest or to lift dead fish from the bottom of cages. Also called air lift system or air water lift.

air lift system = air lift.

air miles = the straight line distance between two points used when describing a specimen collection locality. Abbreviated as ami.

air ploughing = pumping air into lower, unoxygenated layers to encourage mixing and/or oxidation of bottom sediments.

air pump = a pump which supplies air for airstones, lift tubes, under-gravel filters, skimmers, bubblers, ornamental items and other devices in an aquarium. The air bubbles serve to draw water through an under-gravel filter for example. The most common type are diaphragm pumps, though cylinder pumps are available for large installations.

air sac = gas bladder, a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, sound receptor, respiratory organ. Found in Actinopterygii. Often lacking in bottom fishes. Sometimes called swim bladder or air bladder, less appropriate terms).

air vesicle = hard, hollow spheres of bone in Clupeidae.

air water lift = air lift.

airstone = a block of porous material that is attached to the air pump, *q.v.*, to create various bubble effects in an aquarium and to oxygenate the water.

akami = lean tuna from the back of the fish as served in a sushi restaurant.

aktino- (prefix) = ray, hence Actinopterygi, the ray-finned fishes.

*al.* = abbreviation of *alii* or *aliorum*, meaning others, of others.

ala (plural alae) = 1) alar scale.

ala (plural alae) = 2) wing or wing-like process, e.g. a bony outgrowth.

ala laminaris = a lateral ridge on the lower part of the cleithrum, forming a site of attachment for some of the pectoral fin muscles.

alamorkret = literally eel darkness in Swedish, a season when eels are eaten smoked, fried, grilled or stuffed, in company with schnapps.

alar = wing-like.

alar scale = one of the enlarged, elongate flap-like scales at the base of the caudal fin, e.g. in *Alosa*, *Sardina*, *Sardinops*, *Harengula*. Called paracaudal organ in the anchovy. Probably related to fast swimming.

alar spine = a spine on the upper surface of the pectoral fin near the tip, in some male Rajidae.

alar thorn = alar spine.

alarmist = an individual fish which reacts by movement to alarm substances, warning other school members and drawing attention of the predator upon itself, e.g. many Cypriniformes and Gonorynchiformes.

alarm pheromone = alarm substance.

alarm substance = a substance produced in the round or oval alarm substance cells (previously called "clubcells") in the skin of Ostariophysi (Cypriniformes, Siluriformes) and Gonorynchiformes, and which is released upon injury of the skin. On scenting the alarm substance members of the same species, and to a lesser extent related fishes, exhibit the fright reaction (*q.v.*). The dispersal of the alarm substance apparently normally acts to warn of the presence of a preying predator. The alarm pheromone is hypoxanthine-3N-oxide comprising a purine skeleton with N-O functional group and sensitive to relatively weak changes in pH. Also called alarm pheromone or Schreckstoff.

Alaska Scotch cure = a modified Scotch cure, *q.v.*, used in Alaska and British Columbia for herring processing.

alate = winged, as used in anatomical descriptions.

Albany beef = cheap sturgeon flesh marketed in nineteenth century America, in particular on the Hudson River in New York State.

albino = fish lacking pigmentation, having a white to cream colour with red eye (from the blood vessels of the retina being visible). Occurring naturally if rarely in nature, they are bred artificially in aquaria. Cave dwelling species are often albinos. Albinos are less hardy than normal fish, having physiological weaknesses and being sensitive to strong light.

Albright knot = an angling knot used to join two pieces of line of unequal thickness, e.g. a heavy leader to a light main line, or vice versa, or monofilament to wire. Various websites have animated steps showing how to tie this knot.

alcian blue = a cartilage mucopolysaccharide stain used in fish osteology along with alizarin (*q.v.*) for calcium phosphate in bone.

alcohol = a general term for either ethanol (ethyl alcohol) or isopropanol (iso-propyl alcohol) used to preserve fishes in museums at various concentrations in water (70-80% ethanol, 45-50% isopropanol usually). Denatured alcohol is ethanol rendered unfit for human consumption by addition of methanol (methyl alcohol or wood alcohol) or other substances and is used in some fish collections.

alderling = a freshwater fish which haunts that part of the stream overhung by alder trees (English dialect).

alec = a thick sauce or pickle made from the remains of fish from which garum, *q.v.*, has been drawn off. One kind was made from anchovies, another of small herrings. Also spelled allec, allex and hallex.

alecithal = eggs with little or no yolk.

Alee effect = the social dysfunction and failure to mate successfully when population density falls below a certain threshold.

alevin = a young fish with a yolk-sac; larva of species in which postlarval stages are not recognized; that is, in which the yolk-bearing larva transforms directly into the juvenile, e.g. in Salmonidae; the stage from hatching to end of dependence on the yolk sac as the primary source of nutrition.

alewife = *Alosa pseudoharengus* (Clupeidae), reputedly named after female dispensers of ale, noted for their large bellies.

alex = fish brine. Also spelled alix or ellis. See also alec.

algae = simple rootless aquatic plants growing in relative proportion to the amounts of nutrients and sunlight available. They can affect water quality adversely by lowering the dissolved oxygen and thus affecting fish populations but they are also food for fish.

algae wafer = a form of aquarium food designed to sink for bottom feeders.

algae-eating = feeding on algae, especially in reference to fish on phytoplankton.

algaecide = a chemical compound designed to kill algae or retard the growth of algae. Also spelled algicide.

algaestat = a chemical compound that inhibits algal growth and/or reproduction.

algal bloom = the rapid growth of algae on the surface of lakes, streams, or ponds; stimulated by nutrient enrichment. The water takes on a green colour. Also called water bloom.

algal crash = the sudden death of an algal bloom with build up of carbon dioxide and ammonia, and the increase of nitrogen and phosphorus from decay resulting in the removal of oxygen, all leading to fish mortality.

algal scum = a floating layer of algae, either alive or decaying.

algal toxicosis = release of toxins from such algae as *Microcystis*, *Anabaena* and *Aphanizomenon* causing death in fish stocks.

algavore = feeding on algae, cf. algivore.

algicide = a chemical compound designed to kill algae or retard the growth of algae. Also spelled algaecide.

algivore = feeding on algae.

alien = any species not native (indigenous) to the area under consideration, often a politically defined area (country, province, state, etc.). It includes exotic, introduced, transplanted, non-native, non-indigenous, invasive and escaped species. May be used in the sense of a species that has not become established in the wild in the new area.

aliform = wing-like, usually in reference the pectoral fin.

*alii* = others. Abbreviated as *al.*

alimentary canal = the passage through which food passes and is digested and absorbed; includes the mouth, oesophagus, stomach, intestine and anus. Also called alimentary tract, digestive tract and gut, although the latter two might be more restrictive being areas of chemical processing and absorption only and not manipulation as with mouth and oesophagus and associated structures.

alimentary tract = alimentary canal.

*aliorum* = others, of others.

alisphenoid = term misapplied in older literature to the pterosphenoid (*q.v.*) of fishes. It is not homologous with the alisphenoid of mammals and should not be used.

alive and kicking = alert and active, an eighteenth century expression of London fishmongers then referring to fresh fish flopping around on their carts.

alivotype = an unofficial term in nomenclature for a type that is alive and requires special handling and maintenance. Some fish are maintained in aquaria and are preserved on death or sacrifice for formal description as a new species.

alix = fish brine. Also spelled alex or ellis. See also alec.

alix water = the liquid residue in a cask after rendered oil from cod livers has been drawn off in the making of rotted oil.

alizarin = a bone specific stain (actually calcium phosphate in bone and scales), alizarin red S is used to highlight the osteology of a fish specimen. The viscera are often excised and the flesh macerated or cleared (rendered transparent) by enzymes or potassium hydroxide. Preparations are made according to various recipes.

alkaline death point = the pH at which fish die from alkalinity of water, usually about pH 11.0.

alkaline cure = stock fish, *q.v.*, soaked in a solution of lime and soda and then in water for several days.

alkaline gland = a paired organ in the genito-urinary apparatus of *Raja* (and probably other skates and rays) whose cavity is fluid filled. Also called Marshall's gland.

alkalinity = the acid-neutralising capacity of carbonates, bicarbonates and hydroxides in water; the power to keep pH from changing, important for fish as protection against acid rain. Total alkalinity is the total concentration of bases in water, expressed as mg/l of CaCO<sub>3</sub> or as microequivalents per litre (20 ueq/l = 1 mg/l CaCO<sub>3</sub>).

alkalophile = fish from alkaline waters, e.g. Malawian or Tanganyikan cichlids, preferring a pH over 7, preferably around 8.

all quall = talis qualis (Latin for just as they come, e.g. a whole catch of dried and salted cod sold without differentiation of quality or size (Newfoundland)).

all's fish that comes to the net = you should take advantage of anything that comes your way (proverb).

all-female species = the production and survival of a clone by gynogenesis, *q.v.*, e.g. in Poeciliidae, Cyprinidae.

alle- (prefix) = other, different.

allec = alec.

Allee effect = the benefit individuals gain from the presence of conspecifics, e.g. at low densities the per capita birth rate declines because of the difficulty of finding a member of the opposite sex. Also known in fisheries as depensation - mortality is depensatory when its rate (i.e. the proportion of population affected) increases as the size of the population decreases. Depensation may explain why marine fish populations like the Atlantic cod are slow to recover even when fishing is halted. Per capita mortality may increase because of changes in predator-prey interactions, mate availability may be reduced, fertilisation success may be lowered, operational sex ratios may change, and there may be a reduced intensity of social interactions during spawning. Compare compensatory mortality where the mortality rate decreases as the population size decreases.

Allen paradox = the observation that the quantity of benthic invertebrates in a river is insufficient to support the observed fish population.

allergy = humans can be allergic to fish (BWC, personal experience) although not to other seafoods such as crustaceans and molluscs. *Gadus morhua* allergy has been studied the most and other species are believed to be similar although not all fish species may trigger a reaction. Gad c I, a parvalbumin, is the major cod allergen. Symptoms appear within minutes to a few hours of eating fish and include swelling of the lips, tongue or throat, hoarseness, cough, hives, rashes, runny nose and watering eyes, and asthma. Potentially fatal if the throat constricts. Symptoms may be limited to nausea, vomiting or cramping diarrhea.

alley = in angling, a term for patches between emergent reeds or between

alley = in angling, a term for patches between emergent reeds or between reeds and the shore.

allec = alec.

allo- (prefix) = other, different.

allocation = division of a fish resource among harvesters and those needed for reproduction. The harvester can be a person, a vessel, a fishing company, a country, etc. The allocation can be absolute, e.g. a number of tonnes per country based on the TAC, q.v., or relative, e.g. a percentage of the annual allowable catch. May be based on historical harvests.

allochronic species = those species that do not occur in the same geological Period.

allochthonous = food items, organic matter, nutrients etc. that enter an aquatic ecosystem from outside.

allochthonous drainage = a karst drainage derived from surface runoff coming from adjacent impermeable rocks. Also called allogenic drainage. See also autochthonous drainage.

allogenic drainage = a karst drainage derived from surface runoff coming from adjacent impermeable rocks. Also called allochthonous drainage. See also autochthonous drainage.

allohomoiotype= allohomotype.

allohomoitype = allohomotype.

allohomotype = an unofficial term in nomenclature for a homotype (q.v.) of the same sex as the allotype or lectoallotype. Also spelled allohomoiotype and allohomoiotype.

allolectotype = an unofficial term in nomenclature for a type specimen of opposite sex to the lectotype and chosen from the type series subsequent to the original description. Also called a lectoallotype.

allometric growth = parts of the same organism growing at different rates (allometry). See also isometric growth.

allometry = the study of proportional growth rate differences, e.g. how head length changes with respect to increasing body length.

allomone = a chemical produced and released by an individual of one species that affects the behaviour of a member of another species to the benefit of the originator, e.g. a defense mechanism.

alloneotype = an unofficial term in nomenclature for a type specimen of the opposite sex to the neotype (*q.v.*). Also called a neallotype.

alloparalectotype = an unofficial term in nomenclature for a paralectotype, *q.v.*, of opposite sex to the lectotype, designated later than the original publication of the species.

alloparatype = an unofficial term in nomenclature for a paratype, *q.v.*, of the same sex as the allotype.

allopatric = refers to populations or taxa whose ranges do not overlap; geographically separated.

alloplesiotype = an unofficial term in nomenclature for a plesiomorph, *q.v.*, of the same sex as the allotype.

allostasis = the physiological and other mechanisms adopted by fish to cope with stress. These generally have a deleterious effect if prolonged.

allotopic = species with overlapping ranges not occurring together.

allotopotype = an unofficial term in nomenclature for a type specimen from the original type locality of the same sex as the allotype, *q.v.*

allotrop- (prefix) =strange.

allotrophic lake = a lake receiving organic matter from the surrounding land by runoff.

allotype = 1) an unofficial term in nomenclature for a paratype of opposite sex to the holotype and originally designated by the author, a term not regulated by the International Code of Zoological Nomenclature.

allotype = 2) an obsolete term in taxonomy for a specimen of the opposite sex to the holotype chosen by a later worker.

allowable biological catch = a term used by a management agency which refers to the range of allowable catch for a species or species group. It is set each year by a scientific group created by the management agency and is the subjectively estimated amount of catch of a given species from a given region. The agency then takes the ABC estimate and sets the annual total allowable catch (TAC). Abbreviated as ABC.

allowable catch = the catch allowed by a management authority to be taken from a stock of a species or group of species, by a fishery during a specified time period. Often defined as the

total allowable catch (TAC). Often allocated explicitly amongst those having a right of access to the stock.

allowable catch estimate = acceptable catch estimate.

allowable quota = a share in a total allowable quota (TAC) usually divided amongst those with a right to participate in the fishery. Also called quota.

allowance = an amount set aside from a total allowable catch to allow for the expected catch of harvesters who are not subject to quota management. The quota may be hard to enforce, e.g. in an inshore fishery, and these harvesters are free to catch more than their allowance, if they can.

alloy bobbin = a light-weight, hollow bobbin on the footrope of a bottom trawl with holes to allow flooding. Also called drilled bobbin.

alluvial = adjective for alluvium.

alluvial deposits = alluvium.

alluvion = fine sediment.

alluvium (adjective alluvial) = clay, silt, sand, gravel or other material deposited by running water. Often fossil-bearing over time.

Alm's Fb coefficient = the ratio of fish caught to total benthic biomass per hectare.

almas = golden caviar, i.e., either the eggs of an albino sturgeon with a light and delicate flavour or those of *Huso huso* or *Acipenser gueldenstaedtii* at least 60 years of age with a creamy and subtle flavour. Eggs are also described as pale amber or white. In 2007, a 1.8 kg tin cost £25,000. Almas is Russian for diamond.

almost atoll = an atoll whose circular rim is less than 75% complete at low tide.

alongshore = parallel to or near the shoreline. Also called longshore.

alpha taxonomy = the description and naming of species.

alphabet lure = alphabet plug.

alphabet plug = a plug or crankbait shaped like a letter of the alphabet (N, O, S, etc.); used primarily for bass fishing in North America.

alpine lake = a lake in a mountainous area with a cold climate, associated with snow and ice conditions.

altagongi = haltugonga (an expression meaning "stop running" used by fishermen to check the run of a halibut that has been hooked (Shetland Isles dialect)).

alternative name = two names for the same taxon, of the same rank, published simultaneously by an author.

altithermal = a warmer period than today, about 4500-7000 B.P.

altricial = young requiring care or nursing after hatching. Opposite of precocial. Also used to describe ontogeny with large numbers of ova with low energy content, poorly-developed larvae and relatively large clutches in early maturing and slow-growing fishes.

alveolar = pocketed or pitted, honeycomb-like

alveolar ridge = a bony ridge supporting teeth.

alveoli = plural of alveolus.

alveolus (plural alveoli) = a small cavity or space; socket of a tooth; air cell of the lungs.

AM, am or a.m. = abbreviation for *ante meridiem* or before noon; the time before 12 noon.

amarelo cure = yellow cure (Portuguese salt cod with some of the salt removed by soaking in water between stages of washing and drying, yellowish in appearance).

amateur fisher = a fisher that takes fish for fun, sport or family food and do not sell their catch. Also called recreational fisher.

ambicolouration = pigmentation of both the eyed and blind side of flatfishes (Pleuronectiformes) in which, ordinarily, only the eyed side is pigmented. Also called hypermelanosis.

ambient = surrounding on all sides, the conditions in the environment, e.g. temperature.

ambiguotype = 1) an unofficial term in nomenclature for an inadequately described type. Also called Walker type.

ambiguotype = 2) an unofficial term in nomenclature for a type specimen with poor data and/or labels. Usually applied to a primary type (*q.v.*).

ambiguotype = 3) an unofficial term in nomenclature for an unlabelled primary type specimen hidden amongst paratypes or syntypes. These series are usually a mixture of several closely-related species.

ambiguotype = 4) an unofficial term in nomenclature for an inadequately designated type specimen stored with other, superficially identical material.

ambiguous name = a name consistently used by different authors for different taxa; now obsolete (*nomen ambiguum*).

ambush predator = a predator that lies in wait for its prey rather than chasing it, *cf.* active forager. See also pursuing predator and tracking predator.

amelanistic = lacking melanin.

ameni = pond smelt or sand lances cooked in soya sauce with sugar and ame, a sweet millet jelly. Usually preceded by the name of the fish (Japan).

amensalism = negatively affecting one or several species; a form of symbiosis where one of the species suffers as a result of the relationship while the other is unaffected by it.

American caviar = 1) caviar from American species of sturgeons.

American caviar = 2) caviar from non-sturgeon species in North America such as paddlefish (Polyodontidae).

American cut = fish portions or fillets with tapering or bevelled edges, rather than square-cut sides. Also called Dover cut.

American hardness = a measure of hardness used in the USA. One degree is equal to 1 mg/l.

American shore = a length of Newfoundland coast where American vessels were allowed to take bait.

ami = abbreviation for air miles, the straight line distance between two points used when describing a specimen collection locality.

amictic = lakes with a permanent ice cover and so with no circulation.

ammel = dan leno stick (a ballasted wood pole with short rigging ropes attached, functioning like the dan leno bobbin, q.v.) (northeast Scotland).

ammocoete = the larval stage of lampreys (Petromyzontiformes) which is characterized by the presence of an oral hood and the lack of a sucking disk, teeth and developed eyes. The term is derived from the genus *Ammocoetes* in which the larvae were placed before it was realized that they were larval lampreys.

ammonia poisoning = ammonia may build up in aquaria from fish wastes, decaying food and plant material and poison fish. Symptoms are gasping, excess mucus production, reddening skin from capillary haemorrhages, erratic behaviour. An efficient biological filtration system prevents this condition but if it does arise fish need to be moved to a mature aquarium where the nitrogen cycle, q.v., is in full operation.

ammonia tower = a type of biological filtration in aquaria which has media exposed to the air to aid in nitrification through bacterial growth. Common forms are trickle filters and rotating paddle wheel filters. The air/water mix promotes bacterial growth and the bacteria remove ammonia and nitrites. Also called a wet/dry filter.

ammonotelic = excreting nitrogenous wastes mostly as "nitrogen" ( $\text{NH}_3$ , or the ammonium ion  $\text{NH}_4^+$ ). Typical of most fishes.

amnesia = a high breaking strain monofilament line used in still fishing rigs.

amnion = a fluid-filled sac in which the embryo develops in reptiles, birds and mammals. Fish are anamniotes, as are amphibians.

amniote = a classification of vertebrates to include those with an amnion.

amoc = the traditional Cambodian fish dish comprising baked fish wrapped in a banana leaf and served with coconut, chili and lemon grass.

amphi- (prefix) = both, on both sides of, e.g. amphi-Atlantic on both sides of the Atlantic, amphi-American on both sides of America, amphi-Pacific on both sides of the Pacific (these terms may include discontinuous and continuous distributions).

amphiarthrosis = an articulation that allows limited movement, as between vertebrae; cf. diarthrosis and synarthrosis.

amphibi- (prefix) = living a double life.

amphibiont = a species requiring both surface and ground waters in its life cycle. Also called amphibite.

amphibiotic = living in water during an early stage of development and on land during the adult stage.

amphibious = able to live or operate on land and in the water, e.g. mudskippers approach this condition.

amphibite = amphibiont.

amphiboreal = pertaining to an interrupted northern circumpolar distribution.

amphicelous = amphicoelous.

amphicoelous = biconcave vertebrae, having both ends hollowed out, the condition in Elasmobranchii, *Amia* and most Teleostomi except *Lepisosteus* (also spelled amphicelous).

amphidromic point = a point of zero amplitude of the observed or a constituent tide.

amphidromic region = an area surrounding an amphidromic point from which the radiating cotidal lines progress through all hours of the tidal cycle.

amphidromous = fishes which regularly migrate between the sea and fresh water (or vice versa) at some definite stage in their life cycle but not for the purpose of reproduction, e.g. *Sicydium*, perhaps *Megalops* and *Chanos*, some *Galaxias* (Myers, 1949).

amphihaline = showing a broad salinity tolerance and capable of living in fresh or salt waters.

amphimixis = sexual reproduction involving the fusion of male and female gametes and the formation of a zygote.

amphipedal progression = locomotion using the pectoral fins in a manner similar to that used by humans on crutches, e.g. in mudskippers and frogfishes. Also called crutching.

amphyistyllic = attachment of the upper jaw to the skull by means of a process on the palatoquadrate and the hyomandibular bone and by a direct connection between the jaw and braincase, e.g. some Elasmobranchii; basal gnathostomes, other than placoderms).

amphithermic = having a wide tolerance of temperatures, resulting in clines or subspecies.

amphotopic = having a wide tolerance of habitats, resulting in clines or subspecies.

amphitropical = pertaining to a distribution of temperate species interrupted by the tropics.

amplitude = half of the peak-to-trough range (or height) of a wave.

ampulla = a swelling of the end of the semicircular canals.

ampullae of Lorenzini = Lorenzini's ampullae (the mucus filled canal system opening on the snout of Elasmobranchii, *Polyodon spathula* and *Plotosus anguillaris*. May be electric, pressure or temperature receptors).

ampullary organ = an electroreceptor consisting of receptor cells sunk into the epidermis or located in an epidermal cavity opening to the surface through a duct and pore. The duct may be filled with jelly, e.g. in certain Gymnotidae, Mormyridae and Siluroidei.

an- (prefix) = without, not.

ana- (prefix) = over, back, again, backward, upward.

anaba- (prefix) = to go up, hence Anabantidae.

anabiosis = inhabiting temporary water bodies and surviving drought by suspended animation, e.g. Dipnoidi.

anabranch = a diverging branch of a river which re-enters the main stream.

anacanthous = lacking dorsal fin spines. Opposite of phalacanthous.

anacat = fish that live partly in fresh water and partly in the sea and vice versa (from anadromous and catadromous).

anadrom- (prefix) = running up, to go up.

anadromous = running up; said of those fishes which spend most of their life in the sea and which migrate to freshwater to reproduce, e.g. *Oncorhynchus*, *Stenodus*, *Petromyzon*, *Roccus*, *Stokellia anisodon* (Retropinnidae) (Myers, 1949). The opposite is catadromous.

anaemia = deficiency of red blood corpuscles or haemoglobin; in fish a dietary disease due to a vitamin deficiency.

anaemic fish = the ice fishes of Antarctica, e.g. Chaenichthyide, which lack red blood corpuscles.

anaerobic = without oxygen, either as a presence or needed as part of a process.

anaesthetic = a chemical used to reduce a fish's movements or metabolic rate prior to some procedure such as tagging or transport. Chemicals include MS-222 and clove oil and, for fry, novocaine and sodium barbitol.

anaesthetic fishing = angling while numbed under the influence of drugs or alcohol, leads to poor catches and even drowning, *cf.* aesthetic fishing.

anagenesis = evolutionary change along an unbranching lineage (no new species arise) or when one species transforms into another across time.

anagram = a taxonomic name formed by the rearrangement of the letters of a word or phrase, e.g. *Tribolodon* a genus of fishes predates *Tribolodon* a genus of reptiles and the anagram *Bolotridon* was advanced as a replacement name.

anal = pertaining to the anus.

anal fin = the median ventral fin or fins behind the anus. Abbreviated as A, or A1 and A2 if there are two. Also called proctopterygium or proctal fin, it functions to maintain equilibrium against rolling.

anal fin base length = the distance between the origin and the insertion of the anal fin, i.e. the length of that portion of the anal fin in contact with the body.

anal fin depressed length = the depressed length of the anal fin is the distance from the origin to the farthest posterior tip when the fin is flattened down.

anal fin height = the distance from the origin to the tip of the longest ray. Sometimes taken as the greatest vertical height from the base.

anal fin ray count = enumeration of the soft anal fin rays, usually. In fishes where the smaller rays in front gradually grade into larger rays, these smaller anterior rays are included in the count, e.g. Ictaluridae, Esocidae, Gadidae. Where the first small rays abruptly change to larger ones, or where the first small rays are very variable or difficult to count, these are not included; the first unbranched ray reaching nearly to the tip of the fin and the remainder of the rays are then counted - this is called the principal ray count. Where the last two rays are closely approximated at the base, some authors consider them as a branched ray counting them as one (although they are not really a single branched ray). In fishes where the last two rays are not closely placed at the base, the rays are usually both counted. However some authors again count the last two rays as one. In some studies, only the branched rays of the anal fin are counted. It may readily be seen that if published counts are to be of use to others the method of counting should be stated. Anal fin spines, when present, are usually enumerated separately from soft or branched rays.

anal gland = rectal gland (an evagination of the terminal portion of the intestine of Elasmobranchii. Function formerly thought to be related to digestion or excretion, but now

considered to secrete high concentrations of excess sodium chloride. Found also in the coelacanth *Latimeria chalumnae*).

anal lappet = a small skin flap supported by an internal scale or scales over the anal fin base in Cetomimidae.

anal papilla = a fleshy protuberance through which the end of the digestive tract passes.

anal photophores = two rows of light organs, one above the base of the anal fin and the other along the ventrolateral surface of the caudal peduncle. Abbreviated as AO in Myctophidae.

anal ring = one of the dermal plates in members of the Syngnathidae forming a series of rings enclosing the body; the body ring immediately in front of the anus.

anal spine = a spine at the origin of the anal fin before the soft rays. In flatfishes this is not a true spine but the free end of the first distal anal pterygiophore under the skin which may protrude through the skin.

analog products = simulated crab, lobster and other shellfish and fish products made from processed fish flesh.

analogous = similar in structure or function but independently evolved, e.g. the hard ray in the dorsal fin of the carp and the spines in the first dorsal fin of the perch are analogous structures.

analytical operation = research study on a fish stock gathering data that cannot be obtained from commercial operations.

anamestic bone = one of a series of bones in the cheek region that fill in spaces left by the sensory pit-bearing bones; may be used for any bone lacking sensory canals. Often small, of irregular shape and variable between individuals.

anamniota = a classification of vertebrates without an amnion.

anamniote = fishes, including Agnatha, have an embryonic stage without an amnion, as do amphibians.

anastomosing = joining in a network, forming a network, e.g. river channels, blood vessels.

anatomy = the structure of organisms, often revealed by dissection.

anaulacorhizid = vascularisation of a tooth root through scattered foramina of equal size on both outer and inner faces, e.g. in Hexanchidae. A secondarily anaulacorhizid condition occurs where the median groove of a holaulacorhizid type of root is totally overgrown to form a closed tube internally connected or merged with the pulp cavity (Herman *et al.*, 1994).

anazygalia = zygalia (four small cranial bones in Osteolepiformes, perhaps formed from elements of the second to the fourth vertebra, a segment of the primordial cranium. The anazygalia are located dorsal to the chorda dorsalis, the catazygalia ventral to the chorda dorsalis).

ancestor = any organism, population, or species from which some other organism, population, or species is descended by reproduction.

anchialine = anchihaline.

anchihaline = referring to an aquatic habitat with restricted open air exposure, one or more connections to the sea (but not a surface connection), and influenced by marine and terrestrial ecosystems. Found in volcanic and limestone areas, e.g. the bythiid genus *Lucifuga* of Cuba and the Bahamas. Also spelled anchialine.

anchor = a metal device lowered on a line or chain and used to secure a vessel to the sea bed. Also used to secure nets. Anchors have flukes (points that dig into the bottom or grab rocks; the flattened part is called a palm) connecting by arms to a crown, a shank (a vertical bar) rising from the crown, many also have a stock (a horizontal bar that prevents rolling over) which passes through an eye, and a ring (where the rope or chain is attached). There are many different type and sizes of anchors, e.g. see [killick](#), Admiralty pattern anchor, ice anchor and trawl anchor.

anchor (verb) = to affix an object, such as a net, to the sea floor, using an anchor or similar device. An anchor is set, by which it is pulled to engage the flukes in the sea bed or against rocks. However its weight alone may prevent movement of a boat or net.

anchor buoy = a large, spherical buoy supporting and marking the various ropes connected to the main anchor used in Danish seining.

anchor ice = frazil ice that collects on the stream or lake bed, or extends down to the water bottom.

anchor net = set gillnet (a gill net fixed to the bottom or a distance above it by anchors or ballast. Also called straight net, sunk gillnet, sunken gill net, sunk net).

anchor rope = 1) a rope connected to an anchor or anchor chain.

anchor rope = 2) a cable-laid rope acting as a spring between the anchor wire and anchor buoy in a Danish seine. Also called anchor trot.

anchor seine = Danish seine (a seine or cone-shaped otter trawl which is hauled over an area of about 2 square kilometres to a stationary vessel from an anchor buoy, the very long towing ropes disturbing clouds of mud which help herd the fish into the net. Also called Danish seine trawl or Danish trawl).

anchor surface net = a set gill net fixed to fish near the surface. Also called surface gill net.

anchor tag = an alphanumeric or colour-coded tag attached through the flesh near the dorsal fin of a fish. A special injection device allows numerous fish to be tagged rapidly.

anchor trot = anchor rope (2).

anchor worm = a copepod crustacean parasite of the genus *Lernaea* found on fish gills. No intermediate host. Worm-like in shape and often quite large and obvious, forming ulcers at the attachment point, and inducing scratching and flashing through irritation. Heavy infestations, especially of small or larval fish, may lead to hypoxia through increased respiration. Found in freshwater fishes, particularly cyprinids in culture and as bait minnows.

anchored fish aggregating device = a fish aggregating device (*q.v.*) that is anchored close to the coast and used in artisanal fisheries.

anchored gillnet = bottom-set gillnet (a net anchored on or close to the bottom by anchors and ballast).

anchored line = a fishing line fixed to the sea bed at one end or at several points along its length.

anchored trap = a pound net (*q.v.*) or fyke net (*q.v.*) set in deep water and maintained in place by lines and anchors. Usually set horizontally but may be set vertically under ice, e.g. for turbot in the Baltic Sea.

anchosen = smallish sprats and herring preserved in a mixture of salt and sugar, or in starched sugar products, with or without spices, saltpetre or other flavouring agents (Germany).

anchovy = common name for various fish species in the family Engraulidae, best known in North America for their salty and decried topping on pizzas but an important and tasty element in European cuisine. Part of caesar salad, Worcestershire sauce and often the basis for garum (*q.v.*). The various species occur in vast numbers as a schooling fish in waters worldwide.

anchovy butter = anchovy paste mixed with butter, used for a filling in sandwiches, savoury biscuits, etc.

anchovy cream = anchovy paste mixed with vegetable oil. Oil content in France is at least 10%.

anchovy culice = a strong broth, boiled and strained, often used for sick people.

anchovy essence = a compound of pounded anchovies and various herbs. May be canned.

anchovy paste = ground anchovies covered with salt, saltpetre, bay salt, sal prunella and a few grains of cochineal; allowed to ripen for six months. Sold in jars or cans.

anchovy sauce = a savoury sauce made with anchovies.

anchovy toast = a toast spread with anchovy, used as a whet to appetite for wine.

anchylose = ankylose.

ancillary collection = material retained in addition to the main specimen in a collection, e.g. frozen tissue, thin sections, body parts, DNA, etc.

ancillary product = additional use, other than the primary one, of a fish, e.g. in a fish used for flesh, use of internal organs, of heads, and as fishmeal, etc.

andric = male.

andro- (prefix) = male human.

androdioecious = adjective for androdioecy.

androdioecy = possessing a single gonad that produces both eggs and sperm. Eggs are fertilised internally and most offspring are clones. Found only in the mangrove killifish (*Kryptolebias marmoratus*) in vertebrates. Some males exist, the numbers varying between populations, allowing greater genetic diversity, while androdioecy allows the fish to colonise new habitats.

androgamone = sperm secretions which depress the activity of sperm in the male genital duct and dissolve the egg membranes.

andropodium = a modified anal fin of Hemiramphidae used to transfer sperm to females. Also cited as being the modified anal fin in Goodeidae.

androtype = an unofficial term in nomenclature for a male specimen in the type series.

anerytheristic = lacking red pigmentation.

anesthetic = anaesthetic.

anfish = a legendary hairy fish of the lower Tigris-Euphrates basin in Iraq; possibly a marine mammal entering from the sea or the otter.

angel fillet = block fillet (a fillet comprising muscle mass from the side of the fish, usually joined at the back or belly. Also called cutlet, double fillet or when smoked golden cutlet).

angio- (prefix) = vessel.

angiogenesis = development of new blood vessels, as in embryos and tumour formation. See also shark cartilage.

angishore = 1) a man too lazy to fish (Newfoundland).

angishore = 2) a migratory fisherman from Newfoundland who conducted a summer fishery from a fixed station on the coast of Labrador.

angle = 1) the bony protuberance posterior to the jaw gape where the angular, articular and quadrate bones join. Ventrally directed and especially prominent in some larval fishes.

angle = 2) old word for a hook. Hence to angle, angler.

angle = 3) to fish with a hook, rod and bait.

angle = 4) to scheme, or to try and get something by devious or illegal means.

angle = 5) a sharp bend in a river.

angle = 6) a curved inlet of a lake or pond.

Angle = 7) a member of a Germanic people that migrated to England from a fish hook-shaped area of southern Jutland in the 5th century A.D., hence England.

angle-bow = a running noose or slip-knot, especially on the end of a stick, used to catch fish (English dialect).

angle-bowing = poaching fish by means of an angle-bow.

angle-dog = an earthworm used for freshwater fishing (Newfoundland).

angle-rod = a fishing rod.

angle iron chain = chain bracket (a chain used on an otter board in place of a bracket. Also called back board chain, board chain, chain triangle, towing chain).

angle with a silver hook = a failed fisherman who buys his fish to take home, using silver coins in the past.

angler = 1) a person using an angle to catch fishes, and usually a rod and line too; a recreational fisher. The fish may be released or kept as food but they are not sold. Angler encompasses both sexes in contrast to fisherman.

angler = 2) a pilferer having a stick with a hook at the end to steal goods from shop windows (archaic).

angler day = one person angling for any part of one day.

angler survey = a survey of anglers and their catches either off-site by mail, email, telephone, door-to-door, etc. or on-site by access, roving, aerial, etc.

anglerfish = a member of the Order Lophiiformes, comprising over 313 species in 18 families. They have a fishing apparatus developed from the first ray of the spiny dorsal fin comprising the illicium (*q.v.*) or fishing rod tipped by the esca (*q.v.*) or bait. The apparatus is used to attract other fishes close enough to be gulped down.

anglers association = a group of individuals paying an annual fee to fish in waters owned or leased by the association. Membership may be in the many thousands and the association can set rules for fishing gear and times, angling contests, stock waters with fish, and influence national policies on fish management. Also called fishing club or fish club.

angleworm = a small earthworm used as bait in angling, usually for small stream trout and panfish, cf. night crawler.

angling = fishing with a rod and reel or a rod and line, usually for sport but also an effective way to catch some species for research purposes (or so ichthyologists maintain) and similar methods are used for some commercial fishing. Strictly uses an angle or hook but generally synonymous with sport fishing, *q.v.* See also recreational fishery.

angling apparatus = fishing apparatus (a mechanism for attracting prey close to the mouth in members of the Lophiiformes formed from dorsal fin spines modified into a fishing rod (illicium) with a lure (esca) at the tip).

angling association = anglers association.

angling cove = a receiver of stolen goods.

angling device = the modified dorsal fin on anglerfishes (Lophiiformes) used to attract prey.

angling for farthings = begging out of a prison window with a cap or box let down on the end of string (archaic). Farthings were a coin worth a quarter of a penny.

angling machine = an automated rod and line system on the side of a vessel. The machine can jig to catch the fish, rotate to bring the fish on deck, and jerk to release the fish from the hook.

angling rod = fishing rod (1) a device to carry and project a fishing line, hook(s) and bait or lures. The construction of rods is both a craft and a science and there is an immense varieties for particular species. Originally made of wood (split cane), now made of fibreglass, graphite/fibreglass or kevlar).

angling wand = fishing rod (1) a device to carry and project a fishing line, hook(s) and bait or lures. The construction of rods is both a craft and a science and there is an immense varieties for particular species. Originally made of wood (split cane), now made of fibreglass, graphite/fibreglass or kevlar).

anguiform = snake-like or snake shaped.

anguilliform = 1) eel-like in shape.

anguilliform = 2) sinuous type of swimming as in an eel. See also carangiform, labriform, ostraciform, thunniform.

anguiniform = anguiform.

angular = the triangular, paired dermal bone on the posterior ventral corner of the lower jaw. Also applied to the dermal bone of the lower jaw which articulates posteriorly with the quadrate, in which case the preceding bone is known as the retroarticular. In mammals this bone becomes the malleus of the inner ear.

angulas = deep-fried elvers (young *Anguilla anguilla*), a Basque delicacy.

angulate = having definite angles or corners.

angulo-retroarticular = retroarticular (the triangular, endochondral, dermal or mixed origin bone on the back, hind corner of the lower jaw. Often called the angular, Bridge's ossicle *a*, or lower articular).

anguloarticular = articular (the deep, endochondral bone of primitive acanthopterygians in the middle of the lower jaw between the dentary and the angular (or retroarticular) which articulates with the quadrate. It is later invaded by the angular. Divided into the distal part (wanting in Teleostomi) and the proximal part. Occupies the position of Bridge's ossicles *b* and *c* in *Amia*. Found as a distinct structure in *Amia*, *Lepisosteus*, *Polyodon* and Acipenseridae).

angulosplenial = articular (the deep, endochondral bone of primitive acanthopterygians in the middle of the lower jaw between the dentary and the angular (or retroarticular) which articulates with the quadrate. It is later invaded by the angular. Divided into the distal part (wanting in Teleostomi) and the proximal part. Occupies the position of Bridge's ossicles *b* and *c* in *Amia*. Found as a distinct structure in *Amia*, *Lepisosteus*, *Polyodon* and Acipenseridae).

animal pole = the location on the fish egg where polar bodies emerge. It corresponds to the point of fertilisation just below where the sperm penetrates the chorion through the micropyle.

animal-vegetal axis = a line passing through the animal and vegetal poles of the embryo before epiboly.

aniotype = cheiotype (a type specimen of a species designated by a manuscript name).

anisakiasis = a disease caused by a nematode parasite. *Anisakis* can infect humans causing gastric problems if raw or lightly processed fish, e.g. cold smoked, is consumed. Freezing below -18°C followed by frozen storage for 24 hours kills this parasite. The parasite is found in the viscera and muscles of such fish as herring. Marine mammals are the definitive host. Also called anisakinosis.

anisakinosis = anisakiasis.

aniso- (prefix) = unequal, uneven.

anisogamy = reproductive products of unequal size (eggs and sperm).

anker = a barrel containing, and a measure, of salmon (Orkney and Shetland dialect).

ankimo = monkfish liver as served in a sushi restaurant.

ankled = said of fishing nets twisted together. See also hankle.

ankylose = to fuse together, e.g. fusion of two bones or teeth to bone to form one part. Sometimes spelled anchylose.

anlage (plural anlagen, German) = the initial clump of cells from which develops an organ or structure; primordium.

anlagen = plural of anlage.

annatto = a vegetable dye used for colouring smoked fish.

anno = to row against the wind to keep a boat from drifting, while rod or handline fishing is going on (Caithness dialect).

*anno domini* = Year of the Lord, the Christian dating system. Common era or CE is used as a neutral version. Abbreviated as A.D. or AD.

annosman = the man who annos the boat.

annotation slip = determination slip (a label with a specimen with the species identification, identifier, date of capture, collector(s), etc. The label may be attached to the specimen or with it in a jar or other container).

annual canvas = a compilation of available fishery records made annually.

annual fish = a fish which normally completes its life cycle in a year and dies, only the eggs surviving, e.g. certain South American and African cyprinodonts dwelling in ponds which disappear in the dry season, *Astrofundulus*, *Rachovia*, *Aphia pellucida*, *Cynolebius*.

annual flood = the highest annual peak discharge of a river.

annual growth rate = the increase in weight of a fish over one year (final weight divided by initial weight). Abbreviated as h or  $\bar{h}$  (Ricker, 1975).

annual migrant = a fish that makes regular yearly migrations for spawning and/or feeding.

annual mortality = the percentage of fish dying in one year due to natural causes. May also include those taken through fishing.

annual mortality rate = the ratio between the number of fish which die during a year from causes other than fishing and the number alive at the beginning of that year. Also called annual natural mortality rate, conditional natural mortality rate, seasonal natural mortality rate. Abbreviated as m or n.

annual natural mortality rate = annual mortality rate (the ratio between the number of fish which die during a year from causes other than fishing and the number alive at the beginning of that year. Also called conditional natural mortality rate and seasonal natural mortality rate).

annual product sampling plan = in food inspection of fish, the type and number of analyses to be carried out on an annual basis.

annual production = 1) tonnes of market-sized fish produced by an aquaculture facility in one year.

annual production = 2) the amount of fish produced by a defined area of river or lake.

annual ring = a growth ring formed over the course of one year.

annual species = one in which free-swimming individuals live for less than one year, their fertile eggs hibernating in soil during the dry season, e.g. some rivulin Cyprinodontidae.

annual surplus production = the assumption in fisheries that there is a biomass removable without changing population size.

annual total mortality rate = the number of fish which die during a year divided by the initial number. Also called actual mortality rate, coefficient of mortality. Abbreviated as A.

annual turnover = 1) the total biomass produced in one year.

annual turnover = 2) the spring and fall mixing of water in a lake caused by wind, annual air temperature cycle and heating from the sun.

annualism = the state of being an annual species.

annular = ring-shaped.

annular drainage system = a drainage system arranged in a circular fashion around a central basin. See also dendritic, deranged, parallel and rectangular drainage systems.

annular sclerite = annulus.

annuli = plural of annulus.

annulled name = an originally available name that has been suppressed by the International Commission on Zoological Nomenclature and consequently becomes unavailable for purposes of priority.

annulled work = a publication that the International Commission on Zoological Nomenclature has ruled must not be used for purpose of nomenclature.

annulment = the suppression by the International Commission on Zoological Nomenclature of an available name as unavailable for the purposes of priority and homonymy, and the ruling of a work as unavailable.

annulus (plural annuli) = a ring or rings on a fish scale or in a bony or cartilaginous structure corresponding to a year of growth. In a scale usually consists of closely arranged ridges (circuli). An accessory annulus is a ring caused by retarded or temporarily terminated growth that does not represent an annual cycle. In the tropics annuli may indicate spawning rather than growth.

annum = year. Usually used in combination, e.g. Ma, meaning million years.

anomaly = departure from normal.

anoman = any animal species other than *Homo sapiens*; from "animal other than man".

anomen = plural of anoman.

anonymous = of a name, nomenclatural act or work whose authorship is not stated. Also where the identity of an author cannot be determined from the work itself. Abbreviated as anon.

anoxia = the lack of oxygen in an environment.

answer = a bite in fishing.

Ant = a photophore at the anterodorsal margin of the orbit.

ante- (prefix) = before, in front of.

*ante meridiem* = before noon; the time before 12 noon. Abbreviated AM, am or a.m.

antecedent stream = a stream already in place before the rise of a mountain range, subsequently cutting through the rock at the same rate as the mountains rise and so maintaining its position. This has consequences for fish distribution, dispersal and migration.

antecedent year = the year when fish were spawned.

antennulae microvillares = mucopolysaccharide threads or tufts, the mucus filaments on the outermost layer of skin.

antepenultimate = the third from the end; one preceding the penultimate.

anteriad = in front of; towards the front end.

anterial = towards the anterior end.

anterials = teeth on the anterior field of the oral disc of lampreys (Petromyzontidae).

anterior = in front; front (also used for towards the front end, strictly anteriad). Opposite of posterior.

anterior anal photophores = the row of light organs just above the base of the anal fin in Myctophidae (abbreviated AOa).

anterior cardinal vein = paired veins draining blood from the head into the common cardinal veins.

anterior cerebral vein = a vein draining blood from the rostrum and eye into the lateral head vein, *q.v.*

anterior circumorals = the first row of anterials.

anterior field = a wedge-shaped section of a scale encompassed by lines from the focus to the antero-lateral corners of the scale. This field is usually embedded in the skin and not exposed.

anterior intestinal artery = a branch of the coeliac artery that serves the enlarged proximal loop of the intestine and the intestinal diverticula.

anterior-posterior axis = the principal axis of the embryo. Also called rostrocaudal axis and embryonic axis.

anterohyal = ceratohyal (the bone articulating dorsally with the interhyal, anteriorly supporting some branchiostegal rays and ventrally joining one or two hypohyals).

anterolateral photophores = an old name for VLO photophores (*q.v.*).

anterorostrum = antirostrum.

antetype = 1) an unofficial term in nomenclature for a primary type (*q.v.*). Also called prototype.

antetype = 2) the most primitive member of a group, a hypothetical ancestor (obsolete).

anthelminthic = a medication used against helminth or worm infestations of fishes.

anthropogenic = involving the impact (usually negative) of mankind on nature.

anti- (prefix) = opposite, against.

anti-fouling agent = a paint used to protect ships or aquaculture cages from attaching organisms. Now regulated in aquaculture because of their build-up in fish tissues and replaced by biodegradable and less toxic products.

anti-freeze = natural proteins in the blood of polar and cool-temperate fishes that prevent formation of ice crystals down to an exterior temperature of -6°C.

anti-helminthic = anthelminthic.

anti-kink = any device used to prevent twisting of fishing line; in angling often achieved by having swivels, *q.v.*

anti-nutrient = a component of plants that can be toxic to fish in high concentrations or decreases the ability to absorb minerals from food. Presents problems in using plants as food in aquaculture.

anti-reverse = a system, such as a switch, preventing fishing reels from spinning in reverse.

anti-tangle lead = a lead weight used to sink the bait in angling having a long length of silicone tubing on either side to protect the line from abrasion.

anti-tangle rig = a ledgering rig used by anglers mostly for carp. Comprises booms, swivels and tubing to help prevent tangles during casting.

antibiotic ice = ice containing a small amount of an antibiotic such as tetracycline used to extend the shelf life of fish. Illegal in many countries because it promotes antibiotic resistance.

antibody = a protein (an immunoglobulin or Ig) produced by the B-lymphocytes in the blood in response to the introduction of a foreign substance, an antigen.

antiboreal = of the south temperate region.

antigen = a substance which induces the formation of antibodies; used to compare relationships among species based on those sharing the same or more antibodies (serum proteins).

antimere = the corresponding element on the opposite side of a bilaterally symmetrical organism, as fishes are.

antimycin A = a chemical produced by streptomyces bacteria and used in a commercial preparation as a piscicide, e.g. in the catfish industry. It inhibits adenosine triphosphate (ATP) formation, the nucleotide necessary for transport of chemical energy within cells.

antioxidant = a food additive that reduces oxidation of lipids and thus rancid flavours in fish, fish oils and fish meals, e.g. vitamins C and E.

antipodean = referring to opposite sides of the world.

antirostrum = the anterior and dorsal projection of the sagittal otolith, dorsal to the sulcus.

antisera = a blood serum with specific antibodies.

antitropical = the distribution pattern where a group is found north and south of, but not in, the tropics. Includes bipolar, bitemperate distributions, e.g. *Sardinops*, *Engraulis*, *Squalus*, *Zeus*.

antitype = 1) paratype (every specimen, other than the holotype, in the type-series; all the specimens on which the author bases the series, except any that (s)he refers to as variants, or doubtfully associates with the nominal species, or expressly excludes from it). Paratype is preferred.

antitype = 2) an unofficial term in nomenclature for an opposite type or countertype, e.g. the mirror half of a fossil split in two.

antitype = 3) an unofficial term in nomenclature for a corresponding specimen of a type series obtained at the same time and location as the nomenclatural type.

antivenene = antivenin.

antivenin = a serum used against venoms such as that of stonefish (*Synanceia*).

antonym = a word of opposite meaning; used unofficially in nomenclature for each name that is not a synonym.

antorbital = a small, paired dermal bone lying lateral to the nasal bone in front of the eye. Sometimes included in the suborbital or infraorbital series because the infraorbital canal crosses it, e.g. in Amiidae, Lepisosteidae, *Elops*, Osmeridae, some Siluridae.

antorbital organ = a photophore on the front and lower edge of the orbit which may manifest itself as the photophore Vn or Dn or as the suborbital light organ.

antron = a synthetic yarn having long and sparkly fibres used in artificial fly tying.

antrorse = angled forward or pointing anteriorly; opposite of retrorse.

ants' eggs = a commercial food for aquarium fish, no longer sold, comprising dried ant pupal cases of no nutritional value.

anus = the posterior opening of the digestive tract by which it communicates with the exterior and through which faeces are voided. Also called vent, although the vent is the opening for reproductive and kidney products too.

AO = a row of photophores along the base of the anal fin and lower side of the caudal peduncle (not including the Prc's at the base of the caudal fin) in Myctophidae. Usually divisible into AOa mostly above the anal fin base and AOp mostly on the caudal peduncle. In some older works AO refers to the antorbital photophores.

AOa = a row of photophores mostly above the anal fin base in Myctophidae.

AOp = a row of photophores mostly on the caudal peduncle in Myctophidae.

aorta = the main blood vessel supplying blood to the body from the heart.

aortic arches = the pairs of arteries running through the branchial arches, connecting the ventral aorta with the dorsal aorta (or for the first two arches to the internal carotid artery). The last four carry the blood supply to and from the gills.

aortic radices = the paired roots of the dorsal aorta, joining posterior to the entrance of the last efferent artery to form the dorsal aorta.

*ap.* = abbreviation for *apud*, meaning in the work of; used in citing the work of an author contained in another work.

aparietal = a form of skull where the parietals are absent, e.g. in Syngnathiformes, Siluridae.

apartment house = a Japanese fish shelter comprising a concrete block about a metre cube with a 30 cm window on each side wall. About a 100 of these are deposited in a suitable area where they attract fish that can be caught by angling, longlines and bottom gill nets set nearby.

apatite II = a proprietary preparation of fish bones used in removing heavy metals from soil and water. The metals are chemically bound into new minerals that do not dissolve or leach over extremely long time periods.

apex (plural apices, adjective apical) = the free tip of a fin, e.g. in sharks.

apex predator = a fish at the top of the food chain, relying on smaller fishes for food.

aphagous = adjective for aphagy.

aphagy = lacking the ability to feed.

aphakic space = the space in the pupil which is not occupied by the lens. The space may be circumlenticular, around the lens as in *Stomias*, ventral as in Omosudidae, some Myctophidae and Paralepididae, or rostral as in Scopelosauridae. A rostral aphakic space may enhance the forward binocular field of vision.

aphetohyoidean = the primitive condition of jaw suspension for gnathostomes (jawed fishes and relatives) where there is a non-suspensory hyoid arch behind a full post-mandibular gill slit.

aphotic = areas never reached by natural light in the deep ocean (deeper than about 800 metres). No photosynthesis occurs.

aphrophil = a reproductive guild (*q.v.*) of a froth nester, where eggs are laid in mucous bubbles made by the fish. Embryos have cement glands and well-developed respiratory structures, e.g. in Anabantidae and some characins.

aphytal = the plantless zone of a lake bottom.

apical = at the apex, tip or end. The apical field of a scale is the posterior end normally exposed when in its natural position. The side exposed to water in gills.

apical margin = the rear edge of a scale. Also called posterior margin.

apices = plural of apex.

apkallu fish = one of seven Babylonian wise men, dressed in the skin of a fish. These wise men lived before the Flood, and were sent by the fish god Ea to teach wisdom to humans and to protect and purify them.

aplacental = viviparous reproduction in which embryos are not connected to their mother's blood supply by a placenta, as is the case in some sharks.

aplacental viviparity = also called ovoviviparity (production of eggs that are fertilised and hatch inside the mother but the embryos lack a placental connection to the oviduct or uterus and so do not feed off the mother. The young are born as miniature adults, free-swimming and feeding).

aplesodic = said of a cartilaginous pectoral fin where basals and radials do not reach the border and so do not offer the support seen in the plesodic fin, *q.v.* More highly derived fish may have other support for the distal fin region such as ceratotrichia, *q.v.*

apparent digestibility coefficient = nutrient ingested-nutrient egested/nutrient ingested. Not all food eaten or ingested is absorbed, the rest is egested as faeces . The absorbed portion is expressed as a percentage according to the above formula.

apo- (prefix) = away from.

apocranial = far from the skull.

apod- (prefix) = without feet.

apode fishes = fishes without pelvic fins, e.g. *Anguilla*.

apogean tidal current = a tidal current of decreased speed occurring monthly as the result of the Moon being in apogee (the point in the orbit of the Moon farthest from the Earth).

apogean tide = a tide of decreased range occurring monthly as the result of the Moon being in apogee (the point in the orbit of the Moon farthest from the Earth).

apogenotype = a type specimen fixed through substitution, e.g. when a genus is renamed through homonymy, the type species automatically becomes the type of the new genus.

apomorph = a derived character differing from the ancestral condition; a new feature or character that arose during evolution.

apophyses = plural of apophysis.

apophysis (plural apophyses) = a narrow expansion protruding from the body of a bone.

apopyle = the anterior opening of the tube formed by the claspers.

apomorphy = a state derived by evolution from a primitive state (plesiomorphy); applied to a character, not a taxon. It relates to the compared character state and the hierarchical level considered, i.e. the character is apomorphic in relation to one state but plesiomorphic to another.

aponeurosis = flattened tendon.

aposematic = referring to a colour or structure that warns of a special means of defense against a predator.

apotype = 1) in nomenclature, an unofficial term for a specimen used to supplement the description of a type. Also called hypotype (*q.v.*).

apotype = 2) an unofficial term in nomenclature for type fixation of a genus-group name through substitution.

apotypic = a term coined to replace apomorphy as the latter strictly applies only to morphological characters.

apparatus Weberei = Weberian apparatus (four bones and associated tissues connecting the gas bladder to the inner ear and conveying pressure changes and sound. Usually the definition includes the first four vertebrae (two and three may be fused), a supporting unit or pars sustentaculum comprising two transverse plates projecting downwards from the fourth vertebra enclosing a circular space for the aorta and the neural complex comprising modified neural arches and spines. Found in the Cypriniformes and Siluriformes).

apparent digestibility coefficient = the value for the food absorbed from diet and not excreted in faeces; nutrient ingested - nutrient egested/nutrient ingested. Abbreviated as ADC.

apparent prevalence = the proportion of test-positive fish in a target population.

appearance = a visual assessment of a fish product based on shape, colour, gloss/dullness, translucency-opacity and surface texture.

appendage = any substantial projection from the body. The pectoral and pelvic fins are paired appendages.

appetency = an instinctive inclination or propensity in animals to perform certain actions, e.g. a male *Betta splendens* will display when sighting itself in a mirror.

appertisation = canned fish; a term used to avoid confusion with semi-preserves, *q.v.*

appetite mood = in angling, used to describe a fish's attitude to feeding. In a positive mood the fish is actively feeding, in a neutral mood a lure or bait will be taken if presented properly, and in a negative mood will not take food, a bait or a lure unless it is by an involuntary reflex action such as a strike at a moving object.

appetitive behavior = 1) purposeful feeding behaviours resulting in the identification and location of specific food items.

appetitive behavior = 2) searching for the stimulus that can release the activity, e.g. a stickleback that has left its nest shows this behaviour when returning to resume fanning of the nest.

appetitsild = skinned fillets of spice cured sprats or small herring packed in solutions of vinegar, salt, sugar and spices or other flavouring agents (Germany, Scandinavia).

application= the use of a name to denote a taxon.

application to the Commission = any zoologist may submit nomenclatural problems to the International Commission on Zoological Nomenclature. These are published in the *Bulletin of Zoological Nomenclature*.

apposition = said of a noun in a scientific name, used as a substantive epithet, not an adjectival one.

appressed = held flat against the body, e.g. appressed pectoral fin. See also adpressed.

approach velocities = water velocities at or near the face of a fish screen, *q.v.*

approved = given approval and promulgated by the International Commission on Zoological Nomenclature.

approved name = one given approval by the International Commission on Zoological Nomenclature for use in nomenclature. Also called nomen approbatum.

April fish = usually appearing as poisson d'Avril, French for April fool, based on a newly spawned, naive and easily-caught fish. A paper fish is attached to a victim's back without him noticing. Occasionally appearing in its English translation.

aproctal bone = the ventral element in the priapium of the Phallostethidae on which articulate the ctenactinia (*q.v.*). Also called axial or pelvic bone.

apron = 1) the false belly of the cod end of a trawl used as a chafing gear.

apron = 2) the netting floor of a bag or stake net.

apron gill net = an L-shaped net comprising a vertical back wall and a horizontally floating apron.

apron reef = the initial stage of a fringing reef, being discontinuous and covering a small area.

*apud* = meaning in the work of; used in citing the work of an author contained in another work. Abbreviated as *ap.*

aqua- (prefix) = water.

aquabot = an aquatic robot or autonomous underwater vehicle used in oceanographic research.

aquaculture = the artificial or controlled culture of aquatic organisms, including stripping and fertilisation of eggs and raising of young to a certain size for release or marketing. Also spelled aquiculture, but this also means hydroponics.

aquafeed = commercial fish food.

aqualung = a self-contained, portable underwater breathing apparatus for divers. Comprises a cylinder(s) of compressed air strapped to the back feeding that air to the diver through a mask or mouthpiece.

aquamarsh = a water body almost completely covered with emergent and floating aquatic vegetation.

aquanaut = an underwater researcher, explorer or swimmer. Also called oceanaut.

aquaria = plural of aquarium.

aquarian = 1) of or pertaining to aquaria (rare).

aquarian = 2) one who keeps an aquarium.

aquariology = the care, maintenance and breeding of captive aquatic animals. Includes design of displays and veterinary medicine and pathology.

aquarist = a person who keeps fish or other organisms in an aquarium. Sometimes used for pondkeeper and fishkeeper.

aquaristics = the study of aquarium organisms on a scientific basis.

aquarium (plural aquaria) = an artificial tank with glass or plastic sides allowing the fish to be viewed; also a large facility with many aquaria, often open to the public.

aquarium collecting = use of small-meshed nets and traps for collecting fish for display in aquaria.

aquarium furniture = a general term for castles, mermaids, pirate ships, treasure chests and other dubious items made for decorating aquaria.

aquarium material = species bred in an aquarium rather than collected from the wild.

aquarium salt = an additive-free salt used in treatment of disease in freshwater aquarium fishes or added in very small quantities of freshwater aquaria where it is beneficial to certain species. Not the same as marine salt, a preparation used to imitate sea water for marine aquaria.

aquariums = sometimes used as a plural for aquarium.

aquascaping = arrangement of plants in an aquarium in an artistic fashion, often with rocks, and including the necessary equipment to maintain the environment.

aquasperm = the morphologically simple sperm of externally fertilizing teleosts. Typically having a round head without an acrosome, a single, generally unadorned flagellum and a short mid-piece with a prominent cytoplasmic canal.

aquatic = living in or near water or pertaining to water.

aquatic chicken = a slang term for *Tilapia* spp., cichlids used extensively for fish farming.

aquatic surface respiration = absorption of oxygen through the gills from the thin (few millimetres), oxygen-rich surface layer of a water body. Used by fish in hypoxic conditions.

aquatic tongue = the use of water currents in the mouth by some fishes, acting as a hydraulic tongue to manipulate food.

aquaticolous = living in water or aquatic vegetation.

aquatoria = water world or habitat.

aquatron = a facility with very large tanks for fish or other aquatic organism studies.

aqueduct of Sylvius = a posterior channel joining the third and fourth ventricle in the brain.

aqui- (prefix) = relating to water.

aquifer = a water bearing geological formation. Springs and wells depend on aquifers for water. Described as artesian (confined) or water table (unconfined). May contain "cave" fishes.

aquiculture = see aquaculture.

aragonite = calcium carbonate skeletons of reef corals and some shells sold as a substrate for marine aquaria. Has high levels of calcium and strontium carbonate.

arbalete = an underwater spear gun used for catching fish.

arbitrary = 1) used of scientific name lacking formal derivation with regard to etymology, an arbitrary combination of letters, or an etymologically incorrect gender assigned to a name, e.g. *Apterichtus ansp* (Böhlke, 1968), an ophichthid named for the acronym for the Academy of Natural Sciences Philadelphia.

arbitrary = 2) said of a gender assigned to a name without a linguistic gender.

arbor = the centre part of a fly reel (spool) where backing and line are wound; usually indicates the size of the spool with large arbors useful in fly fishing to prevent the line from curling.

arbor knot = a knot used to tie line to the reel spool. Has a strength of 60%. The main line is wrapped around the spool, a knot tied across it and a knot tied near the end of the line. a steady pull on the line tightens the first knot against the spool and is locked by the second knot. Various websites have animated steps showing how to tie this knot.

arborescent = treelike.

arborescent organ = 1) a branched, accessory, vascular structure in the gill chamber, e.g. in *Clarias gariepinnis*.

arborescent organ = 2) dendritic organ (a small arborescent organ found between the anus and the anal fin in certain Plotosidae (e.g. *Plotosus*, *Cnidoglanis* and *Euristhmus*). Organ with two main cell types, those with parallel groups of cytoplasmic tubules and many mitochondria, and clear cells with a network of cytoplasmic tubules. May have an osmoregulatory function).

arboriform = form of a tree, branching.

Arbroath smokie = a whole smoked haddock with its backbone retained, usually gutted and headed (Scotland). Initially cold smoked for several hours, then hot smoked. Also known as Auchmithie cure, close fish, pinwiddie. A Protected Geographical Indication, q.v.

arch dam = a curved masonry or concrete dam with a convex upriver shape. The water pressure is transferred by the arch to abutments.

arch- = prefix meaning ultimate beginning.

arch-centra = vertebral centra formed by the growth of the arcualia around the notochord external to the chordal sheath and which fuse to form annual segments which become biconcave centra. Found in Teleostei.

archaeotype = archetype.

archaic = referring to the oldest members of a lineage.

archangel Raphael = usually depicted in Christian art by a pilgrim's staff, or carrying a fish, in allusion to his aiding Tobias (see Tobit) to capture the fish which performed the miraculous cure of his father's eyesight.

archetype = 1) the ancestral type (obsolete and not an official term in nomenclature).

archetype = 2) an ideal type deduced on a theoretical basis or assumed to be a true representative of the taxon (obsolete and not an official term in nomenclature).

archetype = 3) a hypothetical ancestor constructed by elimination of specialised characters (obsolete and not an official term in nomenclature).

archetype = 4) the generalised or idealised pattern shared by all members of a taxon (obsolete and not an official term in nomenclature). Also called morphotype.

archi- (prefix) = first, primitive, original, ancestral.

archibenthic = the waters on the slope beyond the outer edge of the continental shelf at depths between 200-400 and 1000-1100 metres or below the 4°C isotherm.

archicercal = proterocercal (the type of tail fin primitively symmetrical, both internally and externally, and hence one which has not undergone reduction or modification of the original form, e.g. in Petromyzontiformes).

archinephros = the primitive kidney extending the whole length of the body cavity. Found only in embryonic Myxini.

archipelago = a group of islands or an expanse of water with scattered islands.

archipterygium = the primitive lobe-like paired fin. Generally applied to the biserial fin or lobe-fin, e.g. in Crossopterygii, or to the lobe fin of some Elasmobranchii, e.g. *Pleurocanthus*.

architype = an unofficial term in nomenclature for a specimen that formed the basis for a publication of a species before a modern type interpretation. Such a specimen cannot be included with the types unless it is included in a modern category. Also spelled arquetype.

archival tag = an implanted fish tag that detects and records several environmental variables, e.g. water temperature, over time or internal variables, e.g. body temperature.

archive (noun) = 1) a depository for works, i.e. books, papers, journals, separates, unpublished manuscripts, microfilms, CDs, DVDs, or any other form of data or written work. May also include some specimens, perhaps after manipulation or analysis such as bones, tissues, genetic material, etc.

archive (verb) = 2) depositing material in an archive.

arciform = bow-shaped.

arcocentrum = the cartilaginous arch and its base in the vertebrae of Elasmobranchii. Also used in Pycnodont Actinopterygii (Poyato-Ariza and Wenz, 2002).

Arctic cities = dense gatherings of trawlers fishing demersally in Arctic waters.

arcual = of or relating to an arch, e.g. haemal and neural arches in the vertebral column.

arcualia = plural of arcualium.

arcualium (plural arcualia) = an embryonic cartilaginous element from which the vertebrae form. There are primitively two pairs of endoskeletal elements in each metamere and on each side of the notochord, the interdorsals and basidorsals. In the gnathostomes (jawed fishes) there are two additional pairs ventrally to the notochord, the interventrals and basiventrals. All these elements are called arcualia and can fuse to a notochordal calcification, the centrum. Arcualia and centrum make a vertebra.

arcuate = in a smooth arc, not straight or interrupted.

arcus hæmales = plural of arcus hæmalis.

arcus hæmalis (plural arcus hæmales) = haemal arch (the arch which encloses the caudal vein and dorsal aorta and is found on the ventral surface of the more posterior (caudal) vertebrae. In Acipenseridae it is continuous but interrupted in Actinopterygii).

arcus hyoidei = plural of arcus hyoideus.

arcus hyoideus (plural arcus hyoidei) = hyoid arch (the arch lying between the gill arches and jaws, with which it is believed homologous and which helps support the floor of the mouth cavity. Composed in teleostomes of the following paired endoskeleton elements: hyomandibula, symplectic, interhyal, ceratohyal and one or two hypohyals which articulate with the basihyal. The prefixes epi-, cerato- and hypo- should not be interpreted as indicating correspondence with branchial elements bearing the same prefix. Posterothyral (epihyal), anterothyral (ceratohyal), dorosohyal (dorsal hypohyal) and ventrothyral (ventral hypohyal) have been coined to avoid this confusion. Some authors eschew the term epihyal and employ for the epihyal and ceratohyal, posterior and anterior or proximal and distal ceratohyal).

arcus inferiores = plural of arcus inferioris.

arcus inferioris (plural arcus inferiores) = haemal arch (the arch which encloses the caudal vein and dorsal aorta and is found on the ventral surface of the more posterior (caudal) vertebrae. In Acipenseridae it is continuous but interrupted in Actinopterygii).

arcus mandibulares = plural of arcus mandibularis.

arcus mandibularis (plural arcus mandibulares) = mandibular arch (the cartilages and bones of the visceral skeleton forming the jaws. The upper jaw elements are the palatoquadrate or pterygoquadrate cartilages, the lower jaw ones Meckel's cartilages and the angular. This is the basic jaw, the primary mandibles, which have several ossification centres in bony fishes. Teeth and dermal bones are later evolutionary additions and are called the secondary mandibles).

arcus neurales = plural of arcus neuralis.

arcus neuralis (plural arcus neurales) = neural arch (the arch enclosing the spinal cord on the dorsal surface of the vertebrae. Generally continuous in Chondrostei but separate arches in Teleostei give more flexibility. Acipenseridae have two canals, the upper for the longitudinal ligament and the one under it for the spinal cord).

arcus superiores = plural of arcus superior.

arcus superior (plural arcus superiores) = neural arch (the arch enclosing the spinal cord on the dorsal surface of the vertebrae. Generally continuous in Chondrostei but separate arches in Teleostei give more flexibility. Acipenseridae have two canals, the upper for the longitudinal ligament and the one under it for the spinal cord).

area closure = the closure to fishing by particular gear(s) of an entire fishing ground, or a part thereof, for the protection of the population(s) or a section of a population, e.g. spawners, juveniles. The closure is usually seasonal but it could be permanent.

area endorsement = a statement on a fishing license limiting vessel deployment to a particular area.

area swept = the area of the sea floor over which the fishing gear such as a trawl is dragged during its operation. The area is equal to the effective horizontal opening of the gear multiplied by the distance the gear has covered during the period of time considered, e.g. during a one hour trawl haul. Combined with information on the fish quantities caught during the considered time period, the area swept allows an estimation of a relative or absolute value of the fish density (and biomass) in the area.

area temporalis = an area of high resolution in the retina of the eye, e.g. in Clupeidae.

areal = involving a particular area, an area of particular extent.

arenicolous = living in association with sand; more of a terrestrial than an aquatic definition. Also called sabulicolous.

areola (pl. areolae) = 1) one of a series of normal epidermal cells arranged in circles overlying the mormyromasts, q.v.

areola (pl. areolae) = 2) a small space or interstice in a tissue or part.

areolae = plural of areola.

argentea (of choroid) = a silvery guanine layer between the sclera and choroid concealing the melanin in the choroid layer in larvae.

argentium = a silvery dermal layer containing crystals of guanine.

**argulosis** = infestation of fish with the parasitic copepod *Argulus*. It injects a cytolytic toxin and feeds on blood. The injection site may become infected by other parasites and bacteria. Strong infestations cause erratic swimming, flashing, *q.v.*, and loss of growth.

**ariadnophil** = a reproductive guild (*q.v.*) where the male guards eggs deposited in a nest made from vegetation bound together by viscous threads from a kidney secretions. Eggs and embryos are ventilated by male fanning and have a well-developed capillary network for respiration, e.g. *Gasterosteus aculeatus*.

**arithm-** (prefix) = number.

**arithmotype** = 1) an unofficial term in nomenclature for an isotype, *q.v.*, which belongs to a different taxon from the holotype.

**arithmotype** = 2) not in nomenclature and taxonomy, specimens bearing the same collection number, not necessarily representing a single taxon.

**-arium** (suffix) = meaning a display usually involving water such as an oceanarium, *q.v.*

**ark** = an enclosure for keeping or catching fish (Scottish dialect).

**arken** = a cork of a ring net, *q.v.* (west Scotland).

**arles** = a sum of money given to seal a bargain - a shilling (5p) was given to salmon fishermen in Scotland.

**Arlesey bomb** = a teardrop-shaped lead weight with a small swivel used by anglers; available in various sizes.

**arm** = 1) a long and narrow body of water branching from a lake or an inlet of the sea or formed from flooding of an inlet streambed.

**arm** = 2) the combined wing and shoulder of a beach seine (west Scotland; Newfoundland).

**arm** = 3) butterfly (an L-shaped steel plate shackled between the dan leno spindle and legs. Also called banana, boomerang, dan leno arm, dan leno bracket, dan leno spreader, devil's elbow, spreader bar).

**arm** = 4) fish do not have arms but placoderms have rigid "arms" in place of the usual pectoral fins. Each arm has a joint where it leaves the body and another a little more than half-way along. The arms are served by interior muscles and the fish may have "walked" on them.

**armor** = see armour.

**armoring** = see armouring.

**armour** = any outer covering of a fish that protects it, often modified or heavily developed scales and scutes.

armouring = 1) the outer wall of large mesh netting forming part of a trammel net, *q.v.* Also called outer net, outer wall, outwall, outwalling, trancher, wall, walling, windows.

armouring = 2) use of materials to prevent stream bank erosion.

army = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for herrings.

arquetype = archetype.

arrow cast = a short angling cast made in bushy areas. The lure is held in the reel hand (carefully!), the rod butt aimed at the target, the lure quickly released followed immediately by the line.

arroyo = 1) a gully; a small, steep-sided and flat-bottomed channel in an arid area, usually dry but sometimes with permanent water.

arroyo = 2) the waterway of an ephemeral stream deeply carved in rock or ancient alluvium.

Art = a monotypic species which is not one of a series of species which replace one another geographically (German). Compare Artenkreis and Rassenkreis.

Art. = an Article of the International Code of Zoological Nomenclature.

*Artemia* = brine shrimp nauplii are used as food for fry in aquaria and, to a limited extent, adult brine shrimp may be fed to larger fish. The nauplii are hatched from purchased cysts in warm, aerated, saline water and must be rinsed to remove salt before feeding to fry.

Artenkreis = a series of species which replace one another geographically (German); a superspecies or species complex, as opposed to Rassenkreis or Art (obsolete).

arteria branchialis = afferent branchial artery.

arteria branchialis efferens = efferent branchial artery (one of those arteries paralleling the afferent branchial arches (*q.v.*) and joining to form a left and right root or radices of the dorsal aorta).

arterial gas embolism = a condition characterized by air bubbles released from ruptured lung air pockets (alveoli) into the pulmonary circulation. The bubbles then travel to the arterial circulation, where they may block blood flow in the small arteries or capillaries of the brain or heart. The results may be fatal in humans.

artesian well = a deep-drilled well where the water is forced to the surface by hydrostatic pressure. Some fishes have been found in such wells.

arthropterygium = type of pectoral fin covered with external plates and provided with an endoskeleton. Found in *Bothriolepis* (*Pterichthys*).

Article = a section of the International Code of Zoological Nomenclature comprising a mandatory rule or rules.

articular = the deep, endochondral bone of primitive acanthopterygians in the middle of the lower jaw between the dentary and the angular (or retroarticular) which articulates with the quadrate. It is later invaded by the angular. Divided into the distal part (wanting in Teleostomi) and the proximal part. Occupies the position of Bridge's ossicles *b* and *c* in *Amia*. Found as a distinct structure in *Amia*, *Lepisosteus*, *Polyodon* and *Acipenseridae*.

articular process = a projection of the upper border of the premaxilla acting as a fulcrum for the protrusion of the maxilla.

articular sesamoid = coronomeckelian (a small bone on the postero-lateral part of Meckel's cartilage of the lower jaw. Often a point of insertion of the adductor mandibulae muscle. Also called sesamoid angular, supraangular, sesamoid articular, splenial, os meckeli or *d* bone).

articulate = to make a joint with, e.g. the mandible articulates with the quadrate; jointed, e.g. soft fin rays. A diarthrosis articulation allows free movement, amphiarthrosis limited movement as between vertebrae and synarthrosis very little movement as between the two mandibles at the jaw tip. May be used instead of segmented for soft fin rays.

articulated = 1) jointed (like bamboo), e.g. soft fin rays.

articulated = 2) said of a fossil where all the bones are connected together as in life rather than scattered.

articulation = the joint, point or plane of union between two bones; see articulate above.

articulatio (plural articulationes) = articulation.

articulationes = plural of articulatio.

*articulum* = Article.

artificial bait = any bait or lure made of plastic, wood, metal, feathers, etc.

artificial channel = a short channel designed for spawning or rearing fish that live nearby.

artificial classification = a classification based on characters selected for their utility and not indicative of phylogenetic relationships.

artificial fertilisation = the mixing of eggs and milt stripped from fish by fish-breeders in an aquaculture operation.

artificial fish = simulated fish for use in computer graphics such as screen savers, behaviour-based 3D animation, virtual aquaria, virtual reality, etc.

artificial food = feed for fish that is introduced to the water from outside.

artificial fly = an artificial rendering of an insect used as a bait in fly fishing. Fly tying is the method of construction of these flies. Flies may be fished dry (on the surface) or wet (submerged).

artificial hatching = hatching of fish under artificial or controlled conditions.

artificial hole = a cavity in a hollow log, a pipe or made of tile used for fish spawning.

artificial hybrid = a hybrid between species of fish that do not normally hybridise in nature.

artificial key = an identification key based on characters selected for their utility and not indicative of phylogenetic relationships.

artificial lake = a man-made lake.

artificial lure = any manufactured device used to attract and hook fishes. Used in angling and includes spoons, spinners and plugs as well as products designed to imitate worms, eggs, fish, crayfish, etc.

artificial manure = a chemical compound used as a fertiliser, e.g. in fish ponds, as opposed to animal manure.

artificial nose = a device that analyses vapours close to a product as a measure of quality, rather than a nose can detect different odours. The device has to be trained, e.g. for detection of freshness in a particular species of fish. Not yet in use commercially. Also called electronic nose.

artificial production = the spawning, incubating, hatching and/or rearing of fish in a hatchery.

artificial propagation = artificial production. May also include stock transfers, creation of spawning habitat, egg bank programs, captive broodstock programs, and cryopreservation of gametes.

artificial reef = materials placed on the sea floor that serve as habitat for marine organisms including fishes. Can be anything from old tires to a sunken ship.

artificial reproduction = artificial propagation.

artificial sea water = a solution of salts made up to resemble sea water for use in an aquarium.

artificial selection = selection of parental fish in a breeding programme designed to produce specific characters or traits in the young.

artificial smoking = adding colour and flavour to a fish product resembling that of naturally smoked fish.

artificial spawning ground = any structure deliberately put into a water body to encourage or facilitate fish reproduction.

artificial taxon = a group of organisms not corresponding to a natural unit of evolution.

artificials = artificial baits and lures.

artoptygia = plural of artiopterygium.

artoptygium (plural artiopterygia) = paired fin (the pectoral and the pelvic fins (as opposed to the vertical fins)).

artisanal fishery = a traditional fishery involving skilled but non-industrialized operators; typically a small-scale, decentralized operation; normally a subsistence fishery although sometimes the catch may be sold. Usually fishing trips are short and inshore and fishing vessels are small but in developed countries may apply to trawlers, seiners or longliners. Also called small-scale fisheries.

artotype = a joke definition of a type specimen with a unique colour pattern which is actually spots of paint.

-arum = the genitive plural suffix used for species-group names derived from the names of two or more female persons.

as such = strictly as cited.

ascending process = a vertical process on the anterior part of the premaxillary bone in most teleosts. Not homologous with a similar structure in Holostei (*Amia* and *Lepisosteus*), called the nasal process.

ascites = dropsy (a swelling of the fish's body usually caused by bacterial infection, and also by viral infection, osmoregulatory problems, a flagellate protozoan (*Hexamita*), aggravated by poor environmental conditions. Serous fluid accumulates in any body cavity. Other symptoms are lethargy, gasping, increased respiration, colour loss, skin ulceration and exophthalmia. Also called pinecone disease and vertical scale disease because the scales stick out).

ascorbic acid = vitamin C. A deficiency in fish manifests in spinal and hyaline cartilage abnormalities and reduced wound healing, through affects on normal collagen production.

*ascr.* = abbreviation for *ascriptum*.

*ascriptum* = ascribed to or attributed to, e.g. said of the author of a scientific name. Abbreviated *ascr.*

Asian carp = newspaper term principally for silver carp (*Hypophthalmichthys molitrix*), an invasive species expected to reach the Great Lakes in 2010 and devastate fisheries there through competition. Grass carp (*Ctenopharyngodon idella*), black carp (*Mylopharyngodon piceus*) and bighead carp (*Hypophthalmichthys nobilis*) may also be included under this term in North America. See also Chinese major carps.

aspect ratio = a dimensionless ratio expressing how elongated the shape of a flat organ is. In the case of the caudal fin, a high aspect ratio is found in fast swimmers. Calculated as the ratio of height squared to the surface of the fin.

asperite = a rough, bony excrescence.

asperity = roughness or prickliness.

aspic = fish in jelly (fish cooked in acidified brine or vinegar, fried or smoked and then packed in gelatin, gelatin and pectin or aspic. Sometimes includes cucumbers, onions and spices).

aspidin = the acellular bone substance found in the dermal skeletons of Heterostraci. There is an outer dentine layer, a large, cancellous middle layer and a thin, dense, lamellar inner layer. The middle and outer layers may be absent in fossils or replaced with other material. Also spelt aspidine.

aspidine = aspidin.

ASPM = age-structured production model (a stock assessment programme based on a deterministic form of a stock-recruitment relationship, with non-equilibrium tuning of abundance indices).

aspondylous vertebra = a vertebra lacking a centrum although neural and haemal arches are well-developed, e.g. in Cyclostomata, Holocephali, Dipnii, Acipenseridae.

aspondyly = the condition of an aspondylous vertebra.

assemblage = a collection of co-existing organisms at a particular locality and at a specific time, not strictly inter-dependent but with unspecified relationships, e.g. trophic ones, between them.

assembling a net = the joining together of different parts of a net, attaching foot and head ropes and associated gear, so that it is ready for use.

assembly area = the place where a pre-spawning concentration of fish occurs, e.g. at stream mouths.

assessment = the state of a resource, such as a fish stock, as judged by a scientist or scientific body usually for management purposes. The stock may be judged as to size, potential yield, whether it is over- or underexploited, age structure, index abundance, etc.

assessment level = categories of the level of complexity of, and data available for, each assessment (see above).

assimilation efficiency = the rate at which an organism converts food into weight.

assize fish = a royalty assessed on each boat for its anchorage right.

assize herrings = one thousand herrings due thee times a year to the Scottish king from each boat engaged in the herring fishery (historical).

associate type = any of two or more type specimens listed in the original description of a taxon in the absence of a designated holotype, i.e. a syntype or cotype.

associated organism = any organism with which the nomenclatural type was associated when described, e.g. a parasite host, a commensal.

associated species = species that prey upon a target species, are preyed on by it, compete with it for food, living space, etc, or co-occur in the same fishing area and are exploited (or accidentally taken) in the same fishery or fisheries. These interactions can occur at any stage of the life cycle of one or other species and the range of species concerned can therefore be very large.

associerte type = associate type.

astatic = water bodies with fluctuating surface levels; seasonal astatic water bodies dry up annually, perennial ones rise and fall but do not dry up annually.

astaxanthin = a carotenoid pigment found in crustaceans that gives the flesh of fish eating them a pink colour. Also found in microalgae which can be used as a source of pigment for fish feed, e.g. in salmonids where pink flesh is a desired marketing quality. See also canthaxanthin.

asterisci = plural of asteriscus.

asteriscus (plural asterisci) = the otolith in the lagena of the pars inferior. Also called asterisk or lagenolith. The largest otolith in Cyprinidae but small in other fishes. Last to appear during embryonic development.

asterisk = asteriscus.

asterospondylous = a type of vertebra with radiating, star-like calcifications extending to the chordacentrum and autocentrum, e.g. in some Elasmobranchii.

asterospondyly = the condition of an asterospondylous vertebra.

astronomical tide = tide (the periodic rise and fall of ocean water produced by gravitational effects of the moon and sun on the earth. The horizontal movement of water caused by this vertical movement is often called the tide, but correctly is the tidal current).

asymmetrical = lacking symmetry, e.g. Bothidae and Pleuronectidae lack bilateral symmetry, one eye rotating to the other side of the head.

asymptotic length = a parameter of the von Bertalanffy Growth Function, *q.v.*, expressing the mean length the fish in a stock would attain if they were to grow for an infinitely long period. Not the largest observed size of a species.

asymptotic weight = a parameter of the von Bertalanffy Growth Function, *q.v.*, expressing the mean weight the fish in a stock would attain if they were to grow for an infinitely long period.

at-risk fish stocks = stocks that have been identified as being in need of rescue or in need of specific management practices because of low or declining populations.

atarama = tarama (fish roe, often *Cyprinus carpio*, mixed with salt, bread crumbs, white cheese, olive oil and lemon juice in Greece and Turkey to make taramasalata).

Atargatis = Derceto (the Syrian fertility goddess who fell into a lake at Bambyce near the Euphrates River in Syria. She was saved by a large fish and as a result ancient Syrians did not eat fish but worshiped their images as gods. Atargatis is the Greek name, whose temples contained fish ponds, the goddess punishing anyone who ate them by making them ill although her priests ate fish freely in a daily ritual).

Atargis = Dagon (the fish god of the Philistines, the upper half being a man and the lower half a fish. The fish half represented fertility).

athalassohaline lake = a saline lake not of marine origin but from evaporation of fresh water in a system dominated by calcium, magnesium and sulphate (as opposed to sodium and chloride in the ocean). Some of these ion concentrations are more toxic to fish than others.

Atkinson incubator = a series of trays (usually up to ten) with wire-mesh bottoms enclosed in a box or frame with one tray as a lid. Fish eggs are placed on the trays with an egg scooper, each tray taking about 2500 eggs. Four frames are placed in a hatching tank through which water is run at a selected temperature, allowing the eggs to hatch away from predators for stocking the fry.

Atlantic trawl = a four-seam otter trawl designed in Canada.

atlas = the first vertebra which articulates with the skull, often with a strong neural spine reinforcing the connection of the vertebral column and skull.

atoll = a horseshoe or circular array of reef islets, capping a coral reef system that encloses a lagoon, and perched around an oceanic volcanic seamount.

atom trawl = a wingless, midwater trawl with a square mouth towed between two boats. Also called Larsen midwater trawl, Larsen trawl, floating trawl, Larsen two boat trawl, two boat pelagic trawl.

atopotype = a type specimen described from a locality where it is known not to occur.

atresia = 1) the degeneration and loss of an anatomical structure; usually said of ovarian follicles or eggs that may be absorbed in fishes.

atresia = 2) congenital absence or closure of a normal body opening or tubular structure.

atretic = adjective for atresia.

atrial frill = paired ventral structures on the posterior trunk on each side of the tail in *Bothriolepis canadensis* (Placodermi). Suggested to be ventral fins, claspers or an external shell gland.

atrial pore = the opening near the anus which leads from the atrium to the exterior in Amphiox. Also called atriorepore.

atrio-ventricular valve = the heart valve between the atrium and ventricle.

atriopore = the opening near the anus which leads from the atrium to the exterior in Amphiox. Also called atrial pore.

atrium = a chamber, often specifically applied to a cavity in the heart or the chamber exterior to the branchial bars communicating with the outside through the atrial pore in Amphiox. In most fishes it collects venous blood from the sinus venosus and delivers it to the ventricle, generating the first of each doubled heart beat.

attachments = additions to a trawl, may be legal, e.g. chafers to prevent wear, or illegal, e.g. cod-end weights which tend to reduce mesh size and retain undersize fish.

attendant male = a male which is not the member of the spawning pair; often a sneaky male.

attenuate = drawn out, slender, tapering.

attractant = a flavouring added to bait or ground bait (*q.v.*) in angling. Flavours can be sweet or spicy.

attracting device = fish aggregating device (artificial or natural floating objects placed on the ocean surface, often anchored to the bottom, to attract several schooling fish species underneath, thus increasing their catchability. Used with tuna, for example. Abbreviated as FAD for fish aggregating device).

attraction = drawing fish to fishways or spillways of dams through the use of water flow regimes.

attractor = 1) fish attractor (any structure placed in the water to create habitat for fishes).

attractor = 2) a type of fly that is very effective but has little resemblance to a natural food item, usually very flashy and large.

attribute = a characteristic or quality, used in fish and other species descriptions, especially when this extends the diagnostic limits of the original description.

atypicotype = 1) an unofficial term in nomenclature for a type that the author considers uncharacteristic of the taxon.

atypicotype = 2) a type specimen eventually recognised as a variant of a well-known species, e.g. a colour variant.

au naturel = a canned product prepared by cooking fish in its own juice (United Kingdom) or light brine, sometimes with vinegar and flavouring agents added (France).

Auchmithie cure = a whole smoked haddock with its backbone retained, usually gutted and headed (Scotland). Initially cold smoked for several hours, then hot smoked. Also known as Arbroath smokie, close fish, pinwiddie.

*auct.* = abbreviation for *auctorum*, meaning of authors. Used to indicate that a name is used in the sense of a number of subsequent authors and not in its different sense as established by the original author.

*auct. mult.* = abbreviation for *auctorum multum*.

*auct. non.* = abbreviation for *auctorum non*.

*auctorum* = of authors. Used to indicate that a name is used in the sense of a number of subsequent authors and not in its different sense as established by the original author. Abbreviated as *auct.* or *auctt.*

*auctorum multum* = of many authors.

*auctorum non* = not of authors, used when citing a misapplied name by later workers. Abbreviated *auct. non.*

*auctt.* (plural) = *auct.*

[auditory capsule](#) = cartilaginous skeleton about the inner ear in Elasmobranchii, a chondral skeleton in bony fishes comprised of the prootic, opisthotic (or its replacement), intercalar, epiotic (or exoccipital), sphenotic, pterosphenoid and basiphenoid as walls and floor with the parietals and frontals as the roof.

auditory ossicle = one of a series of bones conducting sound, in fishes the four Weberian ossicles, *q.v.*

auditory vesicle = sensory anlage from which the ear develops.

aufwuchs = organisms and detritus coating rocks and plants in an aquatic environment often fed on by fish specialised as scrapers.

[auger](#) = a device used to drill holes in ice for ice fishing with nets or hook and line. May be powered or operated by hand.

aural = pertaining to ears or hearing.

auricle = atrium.

auriculo-ventricular valves = valves at the junction between the atrium and ventricle chambers of the heart, *q.v.* Presumably atrio-ventricular is correct.

austral = of the south temperate region, between the Antarctic and tropical regions. Opposite of boreal.

autapomorphy = a derived characters state unique to a particular taxon (and therefore useful for distinguishing but not relating that taxon).

autecology = the ecology of individual organisms or species.

authogenic drainage = karst drainage derived entirely from absorption of precipitation into karst rock surface. Also called autogenic or autochthonous drainage. See also allogegenic drainage.

author = the person to whom a published work or zoological name is attributed or who first publishes a name satisfying the criteria of availability or valid publication.

author citation = the name of the authority (*q.v.*) for a taxon name, when cited, should follow the taxon name without any intervening marks or punctuation. Its citation is optional and may or may not be followed immediately by the year.

author's extra = a paper removed from a journal or book and so often with adjacent parts of other works attached.

authorised species = any species or species group that a vessel is authorized to retain as specified by the fishery management authority.

authority = the name of the person(s) who originally describes a species, e.g. McAllister is the authority for *Lycodes sagittarius*. The author's name is placed in parentheses if the species is now placed in a genus other than that in which it was originally described, e.g. *Salvelinus fontinalis* (Mitchell, 1815).

authorship = the author of a taxonomic name is the person who alone is responsible for both the name and for the conditions which make it available (*q.v.*), i.e. the diagnosis, etc.

auto- (prefix) = self, automatic, same one, by itself.

autocentrum = an outer ring of cartilage in the vertebrae of Elasmobranchii interrupted by the neural and haemal arches.

autochthonous = originating there (zoogeographical or referring to nutrients or organisms fixed or generated within an aquatic system).

autochthonous drainage = karst drainage derived entirely from absorption of precipitation into karst rock surface. Also called autogenic drainage. See also allogegenic drainage.

autogenic drainage = karst drainage derived entirely from absorption of precipitation into karst rock surface. Also called autochthonous drainage. See also allogegenic drainage.

autodiastoly = jaws suspension where the palatoquadrate is suspended from two articulations with the braincase, perhaps the original form of jaw suspension.

autogenotype = a genotype, *q.v.*, by original designation.

autogenous = separate or discrete, ossifying from an independent centre and, by extension, used in the sense of bones that are not fused to the nearest neighbour.

autograph = a text in the handwriting of the author, either the original or a photocopy.

autolysis = the breakdown of proteins, fats and other body components of fish after death caused by the action of enzymes. The rate depends on temperature.

automatic bail arm = a bail arm on a fixed spool reel that when folded back allows the angler to cast one-handed.

automatic feeder = a mechanism that dispenses food at preset times and in preset amounts in an aquaculture facility. Powered by electricity, water, air or clockwork.

automatic fishing line = whippy bough trap (a fishing rod is bent and the fixed line attached underwater with the baited hook free. When a fish takes the bait, the attachment is released and the tension in the bent rod hooks the fish and holds it out of the water away from predators to be collected later).

automatic longline = a longline mechanism that is fully automated including baiting the hooks, shooting the line and hauling the line.

automatic reel = a fishing reel that winds in line automatically when the fish is hooked or a button is pressed.

automatic tide gauge = a mechanism to measure and record serially the fall and rise of tides, either as a continuous graph or by printing the levels.

automimicry = imitation of oneself or ones own species, e.g. egg dummies in Cichlidae.

automictic parthenogenesis = pairing of one set of chromosomes in egg formation with a copy of itself, a type of virgin birth where no sperm is involved, e.g. in bonnethead shark, *Sphyrna tiburo*.

automobile names = Plymouth Barracuda, Corvette Stingray and Hyundai Tiburon (Spanish for shark).

autonym = an automatically established name, applied to a nominate subordinate taxon.

autopalatine = a paired deep bone on the roof of the mouth, lateral to the prevomer (or vomer). Often called palatines. Usually overlain by the dermal, often tooth-bearing bone, the dermopalatine.

autopotamic = 1) pertaining to organisms adapted to and living out their lives in streams.

autopotamic = 2) originating in fresh water.

autopteroic = pterotic (the paired deep bone and the superficial dermal bone covering it forming the lateral roof of the skull between the parietal and the hyomandibular and in contact with the lateral semicircular canal).

autosphenotic = the deep bone comprising the postorbital process. Often called the sphenotic, it is overlain by the dermosphenotic or postorbital.

autostylic jaw suspension = a type of suspension where the upper jaw is connected directly to the chondrocranium (instead of fastened to the hyomandibular, the hyostylic suspension) by a process from, or fusion with, the palatoquadrate, e.g. in Dipnoi.

autotrophic lake = a lake where most or all of the organic matter present is derived from within the lake, not from the surrounding land.

autotype = 1) the type, by original designation, of a taxon.

autotype = 2) an unofficial term in nomenclature for a specimen designated by the author of a species subsequent to the original publication as being identical to the holotype.

autotype = 3) an unofficial term in nomenclature for a specimen illustrated by the author of a species after the original publication.

autotype = 4) a joke definition in nomenclature of a type specimen originating from a vehicle after having travelled some distance. Presumably quite smelly in the case of a fish.

autumn fry = a fry caught at the end of the growing season, usually characterised by a relatively high vitality.

autumn overturn = autumn turnover.

autumn sickness = a disease of fishes causing deaths and occurring in autumn. Of no known cause or signs of disease.

autumn turnover = the mixing of the entire lake water mass in the autumn (or fall; presumably this is an English phenomenon - see also fall overturn or turnover).

auxiliary brooder = a reproductive guild (*q.v.*) where adhesive eggs are carried in clusters or balls on the spongy skin of the belly, the back, under the pectoral or pelvic fins, or on a hook in the supraoccipital region, or encircled within coils of the female's body. Embryonic respiratory circulation and pigments are well developed, e.g. *Xenopoecilus oophorus*, *Kurtus gulliveri*, *Loricaria piracicalae*.

auxillary scale = one of the small scales in between or superimposed on the larger scales, e.g. in such Pomacanthidae as *Pomacanthoides*.

auxiliary type = a specimen or element to serve as type of a subordinate taxon when the type of a major taxon is inadequate to assign subordinate rank names to the type. Also called sustaining specimen.

availability = 1) the part of a fish population which lives in areas where it is susceptible to fishing during a given fishing season. This part receives recruits from or becomes mingled with the non-available part of the stock at other seasons, or in other years. Fish become available through migration, movement in the water column, or growth. Abbreviated as r or *r*.

availability = 2) whether a certain kind of fish of a certain size can be caught by a type of gear in an area.

availability = 3) catch per unit of effort, *q.v.*

availability = 4) see available name, available nomenclatural act and available work.

available name = a scientific name of an animal satisfies the provisions of the International Code of Zoological Nomenclature, including publications of the name after 1757 in a latinized form or arbitrary combination of letters constructed so it can be treated as one, in a work consistently applying binomial nomenclature, not first published in a synonymy, etc. Not necessarily the valid name.

available nomenclatural act = one that is published in an available work, *q.v.*

available work = a work published after the starting point that conforms to the provisions of the International Code of Zoological Nomenclature and has not been annulled by its Commission. An available name is not necessarily a valid name (*q.v.*), as an available name may be in synonymy (*q.v.*). Conversely a valid name must always be an available one. Available names include *nomen inviolatum*, *nomen conservandum*, *nomen perfectum*, *nomen vanum*, *nomen correctum*, *nomen substitutum*, *nomen imperfectum*.

average annual instantaneous size-specific growth rate = a method for comparing growth rates of fish of equivalent size instead of equivalent age. The average annual instantaneous-growth rate (the average of individual log fork length at age  $n + 1$  minus log fork length at age  $n$ ) is plotted against the length or weight at the beginning of the year.

avidity = the frequency of fishing activity, e.g. the number of days on which fishing trips were made.

avidity bias = bias arising in angler surveys through time spent fishing or frequency of fishing.

avnet = a small net used to catch fish falling out of the main net, e.g. in the herring fishery (Scottish dialect).

avoidance = 1) the probability that a fish or fish school will escape capture by swimming out of the path of a ship or trawl, away from or alongside a gill net, or avoid retention by a hook or trap. May be expressed as a function of size or age (avoidance curve).

avoidance = 2) various cultures do not eat fish, e.g. ancient Syrians believed fish to be holy and did not eat them (see Atargatis); the Bechuana and certain Bantu tribes in Africa. Often associated with social status among pastoralists, only lower class groups consuming fish, or with religion such as the Hindu belief in non-violence to sentient beings and the resulting vegetarianism. Also, certain bodies of water are sacred and fish from there are not eaten.

avoidance curve = the relationship between a fish size or age and its probability of being retained by fishing gear after coming in contact with it.

avoidance response = the actions of a fish to avoid concentrations of chemicals or other factors. Active or passive movement occurs.

avoidance threshold = the lowest concentration of a substance that causes a fish to move actively away from it.

Avon float = an angling float with a balsa body, a slim top and a cane or wire stem used for trotting in fast water.

Avon rod = a through-action, 11-12 foot English fishing rod with a 1-1.5 lb test curve. Used for ledgering or float fishing for large cyprinids.

avowed substitute = a name explicitly proposed as a substitute for an existing name.

avulsed = a stream channel without flow since water has taken a new path.

axanthic = lacking yellow pigmentation.

axial = towards an axis running antero-posteriorly through the middle of the fish; central. Opposite of radial, *q.v.*

axial bone = the ventral element in the priapium of the Phalostethidae on which articulate the ctenactinia (*q.v.*). Also called aprocctal or pelvic bone.

axial hypoblast = a hypoblast consisting of mesodermal and probably endodermal precursor cells developing on the dorsal midline. It includes prechordal plate and chorda mesoderm.

axial skeleton = bones in the axis of the body, comprising the neurocranium, the branchial skeleton, the vertebral column and the intermuscular bones and ribs.

axial swimming = the usual swimming mode of fishes powered by the myotomal musculature and involving lateral bending of the body and oscillating movement of the tail.

axial vein = the unpaired vein in the caudal trunk leading from the caudal vein to the left and right posterior cardinal veins.

axil = the region immediately behind or under the pectoral fin.

axile = belonging to or situated in an axis.

axilla = the region immediately behind or under the pectoral fin.

axillary = pertaining to an axilla.

axillary foramen = a hole through the cleithrum bone of the pectoral fin.

axillary gland = a multicellular structure below the skin dorsal to the pectoral fin, e.g. in *Ictalurus punctatus*, suggested to produce toxin. This is unlikely as no duct allows delivery to the spine tip and production of toxin is known from epithelial spine tissue.

axillary process = a small triangular appendage or a modified scale at the upper or anterior base of a paired fin. Also called accessory scale, inguinal process or fleshy appendage. Functions apparently to streamline the fin when held against the body while swimming.

axillary scale = 1) a small scale superimposed or interspersed with large ones.

axillary scale = 2) axillary process.

axis = 1) a line.

axis = 2) the anterior-posterior axis of the embryo.

axle = dan leno spindle (a steel spindle through a dan leno bobbin, *q.v.* Also called spindle).

axonost = pterygiophore (the cartilage or bone on the outer end of which sit the median fin rays or spines), sometimes the proximal pterygiophore.

azygost = the dermal bone in flatfishes of the family Psettodidae between the prefrontal and the frontal of the lower side.

B

B = biomass, *q.v.*

B 20% B-virg = level of spawning stock corresponding to a fraction (here 20%) of the unexploited biomass. Virgin biomass is estimated as the point where the replacement line for F=0 intersects the stock-recruitment relationship or as the biomass from a spawning stock per recruit curve when F=0 and average recruitment is assumed.

B 50% R = the level of spawning stock at which average recruitment is one half (50%) of the maximum of the underlying stock-recruitment relationship.

B 90% R, 90% Surv = spawning stock corresponding to the intersection of the 90th percentile of observed survival rate (R/S) and the 90th percentile of the recruitment observations.

$B_0$  = virgin or unfished biomass (pronounced B zero). Rarely known. Using mathematical models, it is generally calculated as the long-term average biomass value expected in the absence of fishing mortality. In production models,  $B_0$  is also known as carrying capacity. It is often used as a biological reference point in fisheries management.

B.C. = before Christ, used to designate years before the birth of Christ. Used in scientific dating for relatively recent events, e.g. fish remains in sub-fossil sites. Note there was no year 0.

B.P. = before present, conventionally before 1950 A.D.

B-grade = the third highest grade of freshness for fish in the European community.

bab = 1) bob (obsolete).

bab = 2) to fish for eels (Norfolk dialect).

bab net = bob net.

babber = bob (3).

babbing ground = a place to fish for eels (Norfolk dialect).

babble = a low and continuous murmuring sound as made by running water.

babel fish = 1) a universal translator in the book "A Hitchiker's Guide to the Galaxy" by Douglas Adams, consisting of a small, yellow and leechlike fish inserted into the ear.

babel fish = 2) an internet translation service.

baby = bass (*Micropterus* spp., Centrarchidae) too short to meet tournament standards; usually less than 14 inches (ca. 36 cm). Also called baby, dink, throw back, nubbin, pop corn, and slick.

baby tickler chain = bosum tickler chain.

bacalao = a term for dried salt cod used in Newfoundland (Spanish).

bacallaos = codland, the Bonavista-Cape Race coast of Newfoundland (from the Portuguese bacalhau, cod).

baccalao = bacalao.

baccale = bacalao.

bacaleau = bacalao.

bacalieu skiff = a small decked vessel or schooner used in the fishery off Baccalieu Island, Newfoundland.

baccalo = bacalao.

back = 1) cast (the terminal strand of a handline to which hooks are attached by short droppers).

back = 2) main line (the principal line in a longline from which branch lines depend with hooks attached).

back = 3) the headline, *q.v.*, of a salmon drift net (northeast England).

back = 4) batings (northern Ireland).

back = 5) the perpendicular section of a cod trap opposite the doors.

back bar = channel plate (a u-shaped, steel bracing bar on the back of an otter board, *q.v.* Also called back channel).

back board becket = backstrop (a short wire or chain system between the otter board and bridle on an otter trawl).

back board chain = chain bracket (a chain used on an otter board in place of a bracket. Also called angle iron chain, board chain, chain triangle, towing chain).

back bouncing = in angling, moving a boat slowly in reverse while using fishing lures or bait.

back burden = burden.

back channel = back bar.

back cord = the headline, *q.v.*, of a beam trawl.

back creel = a wicker basket formed to fit the back, chiefly used by fishwives (*q.v.*).

back end feeder = a container with a few holes around its body that allows ground bait to be released slowly when angling. The bait is usually maggots that work their way out and help keep fish in the area where the angler has deposited his fishing rig.

back joust = an itinerant fish-dealer who carried the fish in a basket on his back.

back lead = a break away weight attached to the main fishing line near to the bank of a water body meant to keep the line on the bottom. It can be tied separately by a line to a stick on the bank and have a clip attaching it to the main line. When a fish bites, the main line pulls up and out of the clip.

back line = the main line to the end of which is attached a cast (2) or pasternoster rig (both *q.v.*).

back net = the rear sections of the belly, batings and codend of a trawl.

back of line = end rope (a line connecting the end of the first or last section of a longline backrope or string to the dan line (all *q.v.*). Also called dumb string, longline, dummy, end tow, lud tow and spreadline).

back of net = square and batings (both *q.v.*) of a beam trawl as one section.

back plate = the central steel plate on the back of an otter board, *q.v.*

back reef = the shoreward side of a reef. It comprises the area between the reef crest or algal ridge and the land and it corresponds to the reef flat and lagoon of a barrier reef and platform margin reef systems.

back run = a smaller branch of a river, such as one that runs around an island (Newfoundland).

back shot = a piece of shot (a weight) attached to a fishing line behind the float, sinking the line, to help the float remain steady in heavy wind.

back split = a fish which has been split down the back by a cut made adjacent to the backbone in preparation for further processing as food.

back swamp = a marshy area separated from the main river by banks and at a lower level than the banks.

back trolling = moving a boat in reverse while fishing lures or baits. Allows control over speed and manoeuvering.

back-cast = throwing the fly line behind the angler before the forward cast carries it out over the water.

back-cross = the individual resulting from an interspecific hybrid mating with one of its parental species.

back-end vee = a salmon net with a v-angled section at the seaward end to entrap fish (Newfoundland). See also vee.

back-fin = dorsal fin (the unpaired fin(s) on the midline of the back. Also called the notopterygium. In Pleuronectiformes it is on the opposite side to the anus. In Centriscidae the hind end of the fish has been rotated under the fish so the dorsal fin is on the under surface. Abbreviated as D, D1, D2, or D3 respectively for the only, first, second or third dorsal fins (or their rays and spines). It functions to prevent rolling).

backbar channel = a channel behind a bar connected to the main channel but usually at a higher bed elevation than the main channel. May contain flowing or standing water and thus be a habitat for fishes.

backboard becket = backstrop (a short wire or chain system between the otter board and bridle on an otter trawl. Also called backstrop, board bridle, board leg, board strop, door legs, door strop and sling).

backbone = 1) vertebral column.

backbone = 2) a dorsal spine.

backing = 1) line added to the back of the main line so that the spool of an angling reel is filled up and the main line runs off freely when cast. Also provides extra line should a fish make a strong run but could lose the fish if cheap line is used.

backing = 2) main line (the principal line in a longline from which branch lines depend with hooks attached).

backing down = 1) the process of letting marine mammals such as porpoises and dolphins from a purse seine while retaining the fish.

Backing down = 2) reversing a boat while pursuing a fish.

Backing line = main line (the principal line in a longline from which branch lines depend with hooks attached).

Backlar spine = one of those spines distinctively developed only in the males of Rajidae such as the alar and malar spines (*q.v.*).

Backlash = a tangle of line from a reel's overrun. Also called professional spaghetti or professional overrun.

Backpack shocker = an electroshocker on a frame used for sampling fish in streams and shallow waters.

Backrope = the headline of a drift or ring net (all *q.v.*).

Backrush = backwash.

Backset = an eddy or countercurrent in water.

Backshore = a part of the seashore covered by water only during extreme storms.

Backstrap = backstrop.

Backstroke = a mutant zebrafish (*Danio rerio*) gene resulting in complete lack of otoliths.

Backstrop = a short wire or chain system between the otter board and bridle on an otter trawl. Also called backboard becket, backstrop, board bridle, board leg, board strop, door legs, door strop and sling.

Backstrop equaliser = a block and swivel used as a rolling coupling to a single wire in place of two backstrops.

Backstrop link = a triangular steel link with rounded corners on the back of a trawl's otter board. The backstrop is attached here. Also called board link, door sling ring, shearboard link and VD link.

Backstrop norman = 1) a special u-shaped bolt to which the backstrop is attached. Also called eye.

Backstrop norman = 2) any general attachment mechanism of the backstrop to the otter board of a trawl.

Backstrop ring = a steel ring on the back of a trawl's otter board for attaching the backstrop.

Backstrop roller = backstrop equaliser.

Backswamp = a marshy low-lying area on a floodplain.

backwash = the seaward return of waves after they rush up onto the beach. Some fish species spawn in this wave action, e.g. capelin, *Mallotus villosus*. Also called backrush or run down.

backwater = 1) water turned back on its course by an obstruction or an opposing flow.

backwater = 2) the body or accumulation of water caused by the above especially when it overflows into lowlands.

backwater = 3) a stillwater section of a stream or river beside the main flow but separated by a ridge of land (or an arm of the sea similarly separated from the open ocean), or habitat at the margin of a riffle or run. Sometimes used for water that has backed up compared to its normal flow or for an area off the main part of a lake; often separated from the source during dry seasons.

backwater = 4) white water (frothy water in rapids, breakers or waterfalls).

backwater pool = 1) a pool formed by an eddy along a channel margin. An obstruction such as a bar or a boulder helps create the eddy. The pool may be separated from the channel by sand or gravel bars.

backwater pool = 2) a cove or flooded depression with access to a main stream.

backwinding = allowing a fish to pull line off a fixed-spool reel by winding the handle backwards.

backyard hatchery = family owned and operated fish hatcheries, small and usually found at the back of a house.

bacterial gill disease = a disease caused by unfavourable environmental conditions which then allow an invasion by myxobacteria; fish show a lack of appetite and cannot school properly. The gills show clubbing and fusion of lamellae.

bacterial kidney disease = a disease caused by a corynebacterium; fish show popeyes and large external welts. The kidney is often swollen, the liver pale and abdominal organs haemorrhagic.

bacterial gill disease = a myxobacterial infection of juvenile salmonids and ictalurid catfishes in aquaculture facilities, often breaking out in spring when the fish are growing and crowded in waters where oxygen is low and ammonia levels high. The gills appear off-white and slimy, clubbed and fused. Causes loss of appetite.

bacterial haemorrhagic septicaemia = a bacterial infection with *Aeromonas liquefaciens*, *Aeromonas hydrophila* or *Pseudomonas* affecting fishes of all ages, usually in spring. Usually associated with stress and overcrowding. Haemorrhages occur in the skin, fins, mouth cavity and muscles. Exophthalmia and cavity ulcers may occur. Also called infectious dropsy, red pest, freshwater eel disease, redmouth disease, pike pest and motile aeromonad septicaemia.

bacterial kidney disease = a bacterial infection with *Renibacterium salmoninus* or *Corynebacterium* sp. affecting salmonids, usually when temperatures are falling. The disease may be chronic or acute and has no treatment. Causes swelling of internal organs (oedematous,

grey and corrugated kidneys with off-white lesions) and haemorrhages. Lesions may occur also in the liver and spleen and muscle contractions occur. External symptoms may be absent or include exophthalmy, skin darkening, abdominal swelling, and skin ruptures and vesicles. Also called Corynebacterial disease, Dee's disease and kidney disease.

bactericide = a chemical that kills bacteria, e.g. in an aquarium or with infected fish.

bacteriophagy = feeding on bacteria or having a large food component being bacteria, e.g. cave fishes, cleaner fishes, *Hypophthalmichthys molitrix*, *Labeo rohita*.

bacteriostat = a chemical that restricts the proliferation of bacteria.

bafflet = a wooden mallet for killing salmon used in Northumberland. Supposedly, it was very unlucky to produce the bafflet before the fish were drawn ashore.

bag = 1) the centre part of a Danish seine between the shoulders and cod end.

bag = 2) the belly and baiting of a trawl.

bag = 3) the fish court of a pound net.

bag = 4) the bunt of a purse seine or beach seine.

bag = 5) the cod end of a trawl.

bag = 6) bag limit.

bag = 7) to place a specimen in a container such as a plastic bag.

bag = 8) to catch a fish.

bag = 9) a net to keep cod temporarily until they can be loaded on a boat or towed ashore (Newfoundland).

bag = 10) a specific quantity of fish taken in a cod net (Newfoundland).

bag becket = the halving becket, *q.v.*, of a trawl.

bag becket leg = hauling leg (a wire rope extension of the halving becket joined to the lazy deckie (both *q.v.*). Also called codend gag, gagline and lazy deckie leg).

bag limit = restriction in the catch by number or weight that an angler may take, generally on a daily basis. This may or may not be the same as a possession limit.

bag net = 1) a net for holding fish in aquaculture attached to the cage support frame.

bag net = 2) a conical or cubical bag-shaped net lifted from a boat.

bag net = 3) a conical bag-shaped net with short wings, fastened to poles or anchors, in strong current to strain out fish and lifted before the tide slackens.

bag net = 4) a net, of varying shape, deployed from a boat close to the sea bed. Baits are suspended just above the bag and the net is lifted once a sufficiency of fish has been attracted. A funnel type net may be attached to the mouth of the bag to prevent escape of fish.

bag net = 5) any net in which a fish enters a pocket.

bag off = keeping inshore fishery cod in a net shaped like a bag until the fish are brought ashore (Newfoundland).

bag seine = a seine net (*q.v.*) with a bag or backward extension of netting in the middle of its length. The bag serves to concentrate the fish when hauling in the seine. Some seines have a bag at the side.

bag up = bag off.

bagget = baggit.

bagging = the final process in producing fish meal where the product is put in 100 lb bags after drying and grinding.

baggit = 1) a fish full of spawn (Scottish dialect). Also spelled bagget.

baggit = 2) the bed of roe deposited by salmon in gravel (Scottish dialect).

baggler = the fry of a trout (Scottish dialect).

baggot = baggit.

bagna cauda = a vegetable dip made from anchovies, butter, garlic and oil.

bagoong = fermented salt fish paste made from an anchovy-like fish (*Stolephorus indicus*) in the Philippines, or from young herring, with dill and packed in cans or bottles.

bagoong tulingan = a salted fish product made from tunas (*Euthynnus affinis* and *Auxis thazard*). The head and guts are removed, each flank slashed, and then flattened with the pressure of the hand.

bail = 1) to remove water from a boat.

bail = 2) a metal semicircular arm on an open-faced spinning reel that is folded back to allow line to be cast and engages the line after a cast and rewinds it onto the spool. Also called bail arm.

bail = 3) catching fish by emptying the water from a tidal pool or other small body of water.

bail = 4) to remove fish from a large net with a smaller net, e.g. from a purse seine onto a ship.

bail arm = bail (2).

bail-top jar = a glass jar with a glass top and a rubber or neoprene gasket; a wire mechanism clamps the lid on the jar.

bailer = any container used to bail (1).

bailiff = an agent of the land owner who regulates the fishing rights and fishing regulations in relation to a stretch of water. They can in some cases arrest poachers, seize their tackle equipment and catch. They can also prosecute them and take them to court.

bailing = bail (3 and 4).

baird = a piece of old straw rope teased out and used as a torch to lure salmon to the surface by poachers (Scottish dialect).

bait = 1) natural or artificial foods placed on a hook or in a trap to attract and capture fish. Live bait includes various terrestrial and marine worms, maggots, and fishes.

bait = 2) the act of placing a lure or bait on a line.

bait additive = any compound added to an angling bait in order to increase its attractiveness to fish. The additive may be a dye for adding colour (red, yellow or orange usually) or a flavouring (diverse).

bait apron = an apron with pockets used by anglers to hold tackle and bait while wading.

bait ball = a small school of bait fish that form a ball in the water as an instinctive response to a predator. Also called meat ball.

bait bird = any sea-bird feeding on bait fish in inshore waters (Newfoundland).

bait board = a triangular piece of wood with two raised edges, used to cut up herring and other sea food in Newfoundland.

bait boat = 1) boats that fish for bait to be used in other fisheries, e.g. in Newfoundland a large undecked boat with 5-7 crew, propelled by oar and sail and used to catch capelin (*Mallotus villosus*) for the cod fishery.

bait boat = 2) in angling, a remotely-controlled toy boat for delivering groundbait or a rig to a selected location.

bait box = 1) a plastic container with a perforated lid used to hold bait, e.g. worms, maggots, casters, etc.

bait box = 2) a plastic or wooden container use to hold the bait used in commercial trawl fishing.

bait box holder = a plastic tray that screws into a bank stick and holds bait boxes convenient to hand.

bait casting = casting using a fishing rod and bait casting reel where the reel is positioned on top of the rod. Also called revolving-spool reel.

bait casting reel = a fishing reel in which the spool is not stationary during a cast but revolves, a level-wind reel, *cf.* spin casting reel. The reel is operated with the thumb and hand when casting.

bait colouring = various dyes, in both liquid and powder form, used to colour baits such as maggots, pastes and boilies. The commonest colours are red, orange and yellow.

bait depot = a facility where iced or frozen bait is stored for distribution to fishermen (Newfoundland).

bait dropper = a weighted device used to drop ground bait, *q.v.*, at the desired location. It is attached to the anglers line. A latch its triggered when the dropper touches bottom, releasing the ground bait.

bait fish = 1) fish used to bait hooks either commercially or in sport fishing.

bait fish = 2) small fish eaten by predators.

bait fishing = use of hooks carrying relatively heavy natural food, left in the water to attract and capture fish.

bait flavouring = a concentrated liquid used to add taste to angling baits and groundbaits. Available in numerous types and concoctions.

bait hauler = a commercial fisherman who catches capelin, herring and other bait fishes (Newfoundland).

bait horn = a large sea shell used as a horn to announce the arrival inshore of the food and bait fish capelin (*Mallotus villosus*) (Newfoundland).

bait jack = a wooden tub or quarter barrel to hold bait.

bait net = any net used to catch fish used as bait for larger, commercial or sport fishes.

bait master = a man in charge of boat and nets sent from a banker to catch bait fishes (Newfoundland).

bait punt = bait boat (1).

bait rocket = a device attached to the end of the fishing line, filled with particle bait, and cast out over the area being fished. When it hits the water, it flips upside down and empties the contained bait.

bait seine = a seine used to catch anchovies, sardines and similar fishes to be kept alive in bait tanks to be used later as bait.

bait shed = a structure used for storing fishing bait in Newfoundland.

bait skiff = bait boat (1).

bait squadron = patrol vessels engaged in enforcing the Newfoundland Bait Act of 1888 which prohibits taking of bait fish by foreign fishing vessels or unauthorized provision of bait to such vessels.

bait tree = catalpa (*Catalpa speciosa*), a North American tree, so-called because it provides a home for numerous caterpillars used as bait for catching fish.

bait tub = bait jack.

bait well = a floating container, weighted to keep it stable, used to store bait fish alive.

bait yaud = a woman who gathers bait for fishermen (English dialect).

baiter = a boat catching capelin and herring (usually) as bait for the cod fishery of Newfoundland.

baitholder hook = a hook of various styles with the addition of two, small, forward-pointing barbs in the top of the shank to prevent worms from slipping down the shank.

baitie = a fisher girl or woman, often family of fishermen, who gathered bait (Northumberland dialect).

baiting = 1) the quantity of capelin and herring (or squid) taken aboard a banker at one time for use as bait in the Newfoundland trawl fishery.

baiting = 2) the fishing voyage to the Newfoundland Banks, its duration fixed by the supply of bait aboard the vessel.

baiting needle = a long needle used to mount dead fish and other large bait items onto the tackle.

baitings = batings.

baitpump = a suction system used to gather benthic species as bait for fish.

baitrunner reel = an open face, rear drag reel with a lever at the back. The spool can be set so line can be pulled out freely by a fish. A drag mechanism is activated by the lever.

bakasang = a fermented fish product of Indonesia.

bakbar = the dorsal fin of a flounder (Scottish dialect).

baked herring = herring cooked by baking in an oven, without vinegar.

baklengi = a strip cut out lengthways from the back of a halibut (Scottish dialect).

bakravi = a fat strip, nearest the fins, cut from the back of a halibut (Scottish dialect).

bal bakwa = a salted whole fish with about 20% salt by weight, allowing controlled bacterial action for 6-8 months. Usually warmed in vinegar before serving and found in the Philippines.

balachong = a fermented and salted fish paste from Malaysia. Also spelled blachong. See also garum and trāsi, among others.

balance line = an angling or commercial fishing arrangement where the line has a metal or wooden spreader which has arms depending from it, each carrying a stretch of line and a hook. Any sudden load is adjusted by the bent spreader. Secondary balances can be added to make a system of hooks.

balanced = in angling, the optimal combination of tackle for catching a fish.

balanced diet = foods furnishing all the necessary nutrients required for proper nourishment of a fish. Compare basic diet.

balbakwa = a salted fish product of the Philippines. Usually a whole large fish with 20% by weight of salt added to allow controlled bacterial action during a 6-8 month ageing process. Warmed in vinegar before serving.

Balbiani's vitelline body = yolk nucleus or the dark circular body that appears in the cytoplasm very near the nucleus during the perinuclear stage of oogenesis.

balch = a stout cord used for the head-line of a fishing-net (British dialect).

balik = 1) Turkish for fish.

balik = 2) balyk.

balk = stakes covered with wattles arranged in a semi-circle on the sands so that fish are directed towards the nets as the tide recedes (British dialect).

balker = [huer](#) (formerly a sentry on a high cliff, pointing out pilchard schools (reputedly by waving a small bush) in Cornwall to seine netters. Also called conder, herring caller).

ball = 1) a large, rounded school, e.g. in some catfishes such as juvenile *Ameiurus nebulosus*, and in herrings, *Clupea harengus*. See also balls and fish ball.

ball = 2) said of sea-birds that pounce on a ball of fish or shoal of herrings.

ball = 3) fish don't have balls but are sometimes made into them. A ball of shredded white fish or cod and mashed potatoes, flour or other binding material, usually fried. Also called fish dumpling. See also canned fish ball, catfish ball and ball.

ball mould = a hollow form in which balls of lead are cast as weights for fish nets.

ball-handle reel = a fishing reel with a spherical counterweight on its counterbalanced crank, e.g. found on New-York reels, *q.v.*

ballads = not very common it seems, but the following was composed for the first Ichthyophagous Club (*q.v.*) dinner by the fish commissioner:-

When	the	Ichthyophagous	dines,
There'll	be	many	dish,
Of	things	a	lines,
And	not	caught	fish-,
Steaks	of	all	whales,
Aspic	of	ribs	stew,
Shark-fin	soup	octopus	gurry-gur-roo,
When the Ichthyophagous dines.			

ballast = 1) a weight used to sink a fishing line.

ballast = 2) one of a series of weights along the footrope of a fishing net.

ballast = 3) stones, pebbles and sand, found in the stomach of such as the cod, and reputedly indicative of weather conditions (the fish swallow stones as ballast against an approaching storm) (Newfoundland).

ballast water = water contained in tanks on ships to improve their stability and buoyancy. This water can contain fishes and may be discharged in an area where the fish then become established as exotics.

ballomania = the compulsive syndrome of zoo and aquaria visitors to throw something, coins, marbles, keys, etc., at a static animal in order to provoke movement.

balloon fishing = in angling, the use of a balloon to suspend a bait at the desired depth.

balloon trawl = a light trawl operating off the sea floor.

balls = fish don't have them but are sometimes made into them. A ball of shredded white fish or cod and mashed potatoes, flour or other binding material, usually fried. Also called fish dumpling. See also catfish ball, fish ball and ball.

balsa float = a float in angling made of balsa and used with large shot (weights) enabling the angler to present bait to fish in fast and deep water.

balsa waggle = a short waggle, *q.v.*, made of balsa tapering to a fine point used with fine tackle and small baits on canals and still waters.

Balta trawl = a deepsea trawl used by large stern trawlers.

balyk = dried (sometimes sundried), brined, cold smoked sturgeon, salmon and herring flesh, reddish in colour (Turkey).

banana = butterfly (an L-shaped steel plate shackled between the dan leno spindle and legs. Also called arm, boomerang, dan leno arm, dan leno bracket, dan leno spreader, devil's elbow, spreader bar).

banana fish = 1) something that seemed like a good idea at the time, but wasn't (slang).

banana fish = 2) "A Perfect Day for Bananafish" is a short story by J. D. Salinger published in *The New Yorker* in 1948. The protagonist, Seymour, talks to a young girl on a beach, telling the story of the bananafish. This fish is very ordinary looking but it swims into a hole, eats so much it cannot escape, and subsequently dies of banana fever. The story inspired spinoffs including a Japanese manga comic book series.

band = 1) a strip of pigment that contrasts with immediately adjacent pigment or absence of pigment. A vertical band is a bar, a horizontal band is a stripe.

band = 2) a vertical patch of pigment usually with well-defined margins, more extensive than a bar, running, for example, from the flank onto adjoining fins. Bands are sometimes defined as being oblique or diagonal in contrast to vertical bars.

band = 3) a longitudinal patch of pigment, usually running along the side of the body, broader and less distinct than a stripe, *q.v.*

band = 4) a region of similar structure or optical density laid down during growth of hard parts used in ageing. Also called mark, ring and zone.

band = 5) a strip of pigment that encircles the body.

band = 6) fish strung on a rope, especially from a salt tub when they are hung up to dry (Scottish dialect).

banding = light stripes on smoked fish where the fish was suspended or laid on a mesh and the smoke did not reach the fish.

bang = to push off in boats at random, without having seen any fish in the salmon fishery.

bangie = a man appointed to watch the Solway and Annan River in Scotland for salmon poachers.

banging = fishing in the manner of a bang.

bank = 1) an area where the depth of water is relatively shallow, but normally sufficient for safe surface navigation, and often excellent for fishing, e.g. the Grand Banks off Newfoundland. Can be 20-200 m in oceanic waters but as shallow as 0-5 m in nearshore or fresh waters.

bank = 2) the side of a river, the right bank being on the right when facing downstream.

bank = 3) the side of a lake or other water body other than a river.

bank = 4) a deepwater area extending offshore from the seaward edge of the fore reef to the beginning of the escarpment where the insular shelf drops off to the deep, oceanic water. In the absence of a reef crest, this form of bank is the flattened platform between the fore reef and the deep ocean waters.

bank = 5) an elevation of sand or mud in a river bed.

bank cod = cod populations on the Newfoundland Grand Banks.

bank fish = benthic fish.

bank fisherman = one who engages in the cod fishery on the offshore fishing grounds of Newfoundland.

bank fishery = the cod fishery of Newfoundland carried out on the Grand Banks.

bank fishing = fishing for cod on the offshore grounds of Newfoundland, usually with trawls or hook and line.

bank hook = 1) type of fish-hook used in hand-line fishery for cod offshore (Newfoundland).

bank hook = 2) a large fish-hook, so called from being baited and laid in brooks or running water and attached by a line to the bank (English dialect).

bank line = type of stout line or rope used in the deep-sea fishery (Newfoundland). See also banking cable.

bank man = 1) bank fisherman.

bank man = 2) a vessel in the offshore cod fishery (Newfoundland).

bank protection = stabilisation of river banks to prevent erosion, prevent deposition of material in the stream and conserve fish habitat.

bank reef = large reef growths. These usually are of irregular shape and develop over submerged highs of tectonic or other origin. They are surrounded by deeper water.

bank ship = bank man (2).

bank storage = water absorbed in the bank of a stream or reservoir and returned to the water body when water levels fall.

bank-book = bank book.

banker = 1) a fishing boat used on the banks off Newfoundland.

banker = 2) a Newfoundland fisherman of the bank fishery.

banker = 3) the owner or operator of an offshore fishing vessel (Newfoundland).

bankfull discharge = the stage at which a river first overflows its natural banks.

banking = fishing for cod on the Newfoundland offshore banks.

banking account = a financial balance sheet of a sea fishing enterprise on the Newfoundland banks.

banking anchor = type of ship's anchor used aboard a deep-sea fishing vessel.

banking cable = heavy 5 cm rope used aboard vessels engaged in the offshore trawl fishery of Newfoundland.

banking dory = a dory (*q.v.*) used on the Newfoundland banks.

banking fleet = a number of banking vessels.

banking line = banking cable.

banking outfit = fishing gear and supplies of a vessel engaged in the bank cod fishery (Newfoundland).

banking schooner = banking vessel.

banking vessel = a deep-sea fishing boat, decked and rigged fore-and-aft or powered by an engine, prosecuting the cod fishery on the offshore banks of Newfoundland with hand-lines and trawls operated from small open boats or dories.

banking voyage = the enterprise or period of fishing for cod on the offshore banks of Newfoundland.

bankstick = usually a stainless steel or aluminium rod that holds a fishing rod off the ground at the right angle. A threaded end allows attachment of a Y- or U-shaped rod rest, of a bait box holder, of a keepnet, etc. while the other end is pointed for insertion in the ground. Used in Europe where fishing rigs are left for some time in a fixed position waiting for a bite.

bar = 1) a vertical or diagonal patch of pigment usually with well-defined margins (straight sides), often on the flank of a fish; shorter than a band and/or not encircling the body (*cf. stripe*, an elongate horizontal patch of pigment).

bar = 2) a submerged or exposed ridge in rivers, lakes or the ocean deposited where there is a decrease in flow.

bar = 3) one of the four sides of the mesh of netting.

bar = 4) an area of shoal water at the entrance to an estuary or harbour.

bar = 5) an establishment frequented by ichthyologists (wet bars are favoured of course).

bar = 6) any net or barrier placed in a river to block or bar fish movements and capture the fish.

bar = 7) the fins of a fish forming a fringe (Scottish dialect).

bar = 8) a strip, including the fins, cut from a halibut (Scottish dialect).

bar cut = a cut in netting parallel to the line of sequential mesh bars.

bar net = 1) a gill net with ropes or wooden bars attached vertically used as a gill net or a trammel net.

bar net = 2) the vertical net extending out from a cod trap to obstruct passage of cod and lead them into the trap.

bar net = 3) any net stretched across a river to bar and trap fish.

bar rig = a leader about 1 metre long with a weight at the end and a swivel at the point of attachment to the fishing line. Additional leaders with a hook at the end are attached about 35 cm from the weight and about 35-45 cm up the mainline.

bar seine = net used to close off a small cove so that fish can be taken out with a small seine, e.g. herring in Newfoundland. Also called stop seine.

bar spoon = spinner (a lure consisting of a wire shaft with a hook(s) and a blade that spins when pulled through the water. Variously coloured and decorated with feathers, fur, beads and plastic additions).

bar tackle = rope used to constrict a cod trap when filled with fish (Newfoundland).

barachois = a shallow river estuary, a lagoon or a harbour protected from the sea by a sand bar or low strip of land. May be fresh or salt water (Maritime Canada). Also spelled barrachois and barrisois. See also barasway, barrasway, barrisway, and barrysway.

barasway = barachois.

baray = a large artificial reservoir bounded by dykes in Cambodia, filled by rainwater and diverted rivers. Arguably for irrigation but also symbolised the mythical ocean surrounding Mt. Meru, the home of the gods, and usually surrounding a temple complex. Can be as long as 8 km, 2.2 km wide with dykes up to 17 m high.

barb = 1) another term for spinule (a small spine projecting from a larger spine).

barb = 2) the inward projecting point of a fish hook that prevents a fish from getting off the hook.

barbecued fish = fish roasted or grilled over an open charcoal fire (or its modern equivalent). Served hot.

barbed bone point = a barbed point made of bone and bound to a spear shaft using twine wrapped around grooves on the bone.

barbed tributary = a stream whose upper reach flows in the opposite direction to the lower reach and is evidence of stream capture. The area of flow reversal is called the elbow of capture.

barbel = 1) a slender fleshy process located close to the mouth, usually possessing tactile and/or gustatory sense, and useful in identification, e.g. in Acipenseridae, Gadidae, Ictaluridae, Cyprinidae.

barbel = 2) a petticoat worm by fishermen at Folkestone. See also barvel.

barbel section = barbel zone.

barbel zone = a European river classification system based on species, in this case the cyprinid *Barbus barbus*, as characteristic; a gravelly-sandy bottom, with moderate current.

barber fish = cleaner (a fish which picks dead tissue and parasites off other fishes. Cleaner fish may establish a cleaning station and have a particular behaviour which clues other fishes into their function and prevents them from being eaten).

barbless hook = a hook lacking the barb and thus causing less damage to fishes when caught and when unhooked.

barbule = a small barb or barbel.

barf house = a Yarmouth (England) dialect term for the shed where the first stage in curing herrings takes place.

barge = a large boat used to collect, hold and process the cod catch in the Strait of Belle Isle and on the Labrador coast.

bark = 1) a liquid made by steeping the bark and buds of conifers. Formerly used to preserve fish nets and sails in Newfoundland before synthetic materials were introduced.

bark = 2) soaking nets and sails in bark (Newfoundland).

bark = 3) a noise made by certain fishes has been likened to barking, e.g. the channel catfish, *Ictalurus punctatus*, produces sound when ridges on the ventrolateral surface of the pectoral fin spine's dorsal process rub against the ventrolateral wall of the cleithrum's spinal fossa.

bark boiling = the preparation of bark preservative (Newfoundland).

bark pot = an iron cauldron in which an infusion of bark was prepared (Newfoundland).

bark tub = a wooden container in which nets and sails were soaked in an infusion of bark (Newfoundland).

barking = bark (2).

barking kettle = bark pot.

barking pan = pans in which fishing nets are steeped.

barlopen = said of fish having blisters ion the fins (Scottish dialect).

barloppin = barlopen.

baroclinicity = a state of water column stratification in which surfaces of constant pressure and constant density intersect.

barotrauma = an injury that results from rapid or extreme changes in pressure. Found in fishes pulled from depths rapidly or in humans where may simply be a discomfort in the ear based on differing pressures on either side of the ear drum.

barotropicity = a state of water column stratification in which surfaces of constant pressure and constant density coincide.

barr cut = a longitudinal slice of halibut (Scottish dialect).

barr mark = a vertical strip of pigment on a fish.

barrachois = barachois.

barrage = dams or weirs obstructing fish movements and thus facilitating their capture; also used to control water flow, raise water levels or generate power.

barrage pond = a pond created by damming and excavation.

barrage lake = a larger version of a barrage pond.

barrasway = barachois.

barred = said of a net enclosing a school of fish.

barrel = 1) a measure of liquid volume, 119.24 litres or 158.99 litres, 31.5 U.S. gallons or 42 U.S. gallons, 262.8 lb water or 34.97 Imperial gallons, but can vary.

barrel = 2) a rounded wooden container used to pack fish. A barrel of fish can be 200 pounds or 90.72 kg in the U.S.A. while a barrel of herrings used to be 32 pounds or 14.51 kg in England. See wet barrel.

barrel = 3) an approximate measurement of fish sucha s cod in newfoundland taken from a net or trap.

barrel = 4) an indication of the size or capacity of a fishing boat.

barrel bones = the rib bones severed by filleting and remaining in the edible part of a herring or kipper fillet.

barrel tub = a barrel sawn in two and used for various fisheries purposes (Newfoundland).

barreled salted cod = split slatted cod packed in brine in barrels.

barrel knot = a knot used to join two pieces of line together or to join a line to a leader. Various websites have animated steps showing how to tie this knot.

barricade = a barrier used to lead fish into an enclosure, e.g. fyke net, pound net, etc.

barrier = stakes, branches, reeds or netting temporarily or permanently fixed to the bottom in tidal waters arranged to trap fish.

barrier bank = a shelf-edge bank separating inshore waters from the deep ocean. Rich in nutrients, and fish stocks, from ocean upwelling that washes over the barrier bank, e.g. Georges Bank on the Atlantic coast of North America.

barrier beach = a bar parallel to shore high enough to be above high water. Separated from the mainland by open water (lagoons, bays and estuaries) or by salt marshes. Also called barrier island and offshore barrier.

barrier dam = a low dam on a stream used to divert water, block fish migration or guide fish into a fishway.

barrier island = a long and low barrier beach detached between two inlets.

barrier lake = an area flooded by a dam.

barrier net = stakes, branches, reeds, netting, etc. usually constructed in tidal waters and trapping fish as the tide recedes. Differs from fixed gillnets which, when the tide ebbs, may eventually allow the fish not entangled or gilled to pass freely underneath their bottom line. Includes fences, weirs, corrals.

barrier reef = a coral reef some distance from shore with a lagoon or estuary between it and the shore.

barrier spit = a barrier island connected to the mainland.

barrisois= barachois.

barrisway = barachois.

**barrow** (noun) = 1) a flat, rectangular wooden frame with handles at each corner, made for two men to carry cod. Also called fish barrow, drudge barrow and dredge barrow.

barrow (verb) = 2) carrying cod using a barrow.

barrow tub = a wooden tub or half barrel with handles attached for two men to carry salt cod (Newfoundland).

barrysway = barachois.

barter shop = a store in Newfoundland where fish could be exchanged for goods.

barvel = an apron of leather, canvas or oilskin worn while cleaning fish in Newfoundland. See also barbel (2).

basal (adjective) = 1) at or towards the base; pertaining to the base.

basal (adjective) = 2) opposite of derived, *q.v.* The condition or species regarded as the starting point in the evolution of a character or species.

basal (noun) = 3) a proximal radial notably larger than the middle or distal radials (fin ray supports to the median fins).

basal field = the anterior quarter of a fish scale, normally overlapped by the preceding scale.

basal group = the earliest diverging group within a clade.

basal plate (of a scale) = fibrillary plate (the fibrous lamella or disk forming the base of a teleost scale).

basal process = parapophysis (plural parapophyses)(a long, transverse process arising from the abdominal vertebral centrum. Parapophyses serve to support epipleural ribs (*q.v.*) when present and, in Gadidae, the gas bladder. In Clupeiformes they are not fused to the vertebrae. Also called transverse process and basopophysis).

basal rank = the lowest obligatory rank, the species, every organism being assigned to one. Infraspecific taxa are not recognised in every species. Also called basic rank.

basalia = the fused radials or pterygiophores at the base of a fin. Also termed basipterygia.

basapophysis (plural basapophyses) = parapophysis (plural parapophyses)(a long, transverse process arising from the abdominal vertebral centrum. Parapophyses serve to support epipleural ribs (*q.v.*) when present and, in Gadidae, the gas bladder. In Clupeiformes they are not fused to the vertebrae. Also called transverse process and basopophysis).

basapophyses = plural of basapophysis.

base = proximal part between origin and insertion of fin, extending distally for some distance and supported by skeleton. In the caudal fin, the thickened longitudinal part enclosing the vertebral column and between the epaxial and hypaxial lobes or webs of the fin. In denticles, the anchoring structures that hold these scales in the skin, often with four or more lobes. See also base of fin.

base case = the “typical” or “current” or “reference” case used in stock assessment (including simulations) as the basis for comparisons of management options and formulation of management advice.

base flow = 1) flow of a river composed entirely of groundwater from springs, or from groundwater and lakes excluding surface runoff from precipitation.

base flow = 2) discharge in a stream channel not from runoff and without man-made regulation.

base level = the level below which a land surface cannot be eroded by running water, e.g. a lake; the mouth of a river; the ultimate base level being the sea.

base line = the tolerance level of an organism to a particular substance concentration.

base of fin = region of fin where it arises from the body, between the origin and the insertion.

base port = the port from which fishing units operate, irrespective of where they are registered (homeport).

base runoff = sustained or fair-weather runoff. This is mostly groundwater effluent for most rivers and streams.

base-taxon = an unofficial term in nomenclature for the first originally recognised taxon for a kind of organism; this is usually and traditionally the species.

basel = bassle.

baseline = the line from which the seaward limit of state's territory is measured. Usually the low-water line.

baseline discharge = base flow.

baseost = the distal radial or pterygiophore supporting the fin rays. Also called intercalarium.

basibranchial = one of the deep median bones at the base of the gill arches below the hypobranchials. May occur on arches 1, 2, 3, 4, the last being cartilaginous. The dermal plates bearing teeth and associated with the basibranchials are a separate structure. Each of the basibranchials may be called a copula and the first is named the basihyal.

basibranchial copula = fused basibranchials in Elasmobranchii.

basibranchial teeth = the teeth on the basibranchial bone, behind the tongue and between the gills. Often incorrectly called “hyoid” teeth.

basibranchiostegal = gular plate (the median or paired, dermal, flat bone(s) between the lower jaws of primitive Teleostomes, below the basibranchials. There is a median gular in Amiidae and some Elopidae, Megalopidae and Albulidae, in some Dipnoi there is a second, posterior median

plate while others have two pairs of gulars lateral to the median plate, and in *Latimeria*, *Polypterus* and *Calamoichthys* there is a median plate and a lateral plate on each side).

basic diet = foods which provide the elementary nutritional requirements to assure normal development. Compare balanced diet.

basic rank = basal rank.

basic slag = artificial fertiliser containing phosphate; obtained as a by-product of the steel manufacturing process.

basic type = the primary type, *q.v.*, of a taxon, e.g. a holotype, cotype, lectotype, neotype or paratype.

basicaudal = on the base of the caudal fin.

basicaudal spot = a spot on the base of the caudal fin, common in many unrelated fish species.

basicrania = plural of basicranium.

basicranial fenestra = a large opening in the oticoccipital area below the notochord, e.g. in Sarcopterygii.

basicranium (plural basicrania) = the base of the braincase, usually composed of parts of the basioccipital, basisphenoid and otic capsule.

basidorsal = the cartilage structure above a vertebral centrum, forming the side walls of the neural canal between the interdorsals.

basihyal = the cartilage supporting the tongue at the anterior end of the hyal series in Elasmobranchii. It is the anteriormost median endochondral bone of the basibranchial series, joining both branches of the hyoid series and forming the tongue skeleton in Teleostei. Dorsally it may have a dermal tooth plate called the glossohyal. The basihyal does not always ossify, e.g. in Salmonidae. Also called basihyobranchial and dermal basihyal.

basihyal dental plate = lingual plate (a dermal toothed bone covering and sometimes fusing with the basihyal, e.g. in Osteoglossidae. Also called glossohyal, dermentoglossum, entoglossum, os entoglossum, supralingual or basihyal dental plate).

basihyobranchial = basihyal.

basil = a herb used in fish dishes.

basin = 1) that part of a watershed that slopes towards a common low-lying area where all surface and subsurface water drains, i.e. an area drained by a river and its tributaries.

basin = 2) a vessel less deep than wide as used in aquaculture for holding fishes.

basin = 3) a harbour for small craft.

basin = 4) a hollow containing water, either natural or artificial.

basin = 5) any large depression in which sediments are deposited.

basioccipital = the deep, median, endochondral bone at the posterior end of the parasphenoid on the ventral side of the posterior end of the skull. The bone with which the anterior-most vertebra articulates, it also forms the ventral part of the foramen magnum. In Cyprinidae it bears a posterior expansion forming the pharyngeal process.

basinym = basionym.

basionym = the original name of a taxon subsequently replaced by another using the same stem, as a result of a change in rank or position of the taxon. Also called basinym or basonym.

basipharyngeal joint = a protuberance on the top of the upper pharyngeal jaw meeting the bottom of the skull in Cichlidae.

basipterygia = plural of basipterygium.

basipterygium (plural basipterygia) = one of the endochondral fused radials or pterygiophores at the base of a fin, particularly the pelvics. The two chondral basipterygia of the pelvic fin meet anteriorly at the pubic symphysis to form the pelvic girdle. The body of the bone is called the pubic plate and bears an acetabular facet for articulation of the fin rays or the radial bones. An anterior process is known as the pubic process, a middle as the iliac process and a posterior as the ischial process. Also called basalia or pelvic bone. It articulates with the antimere, *q.v.*, the corresponding bone on the opposite side.

basis cranii = the shelf formed by wings of bone developed from the inner sides of the prootics which meet and form a roof to the myodome and a floor to the brain cavity.

basis species = any species or group of species open to directed fishing by an authorised vessel.

basisphenoid = the small, Y-shaped, deep, endochondral cranial bone ventrally covered by the parasphenoid and medial to the pterosphenoids forming part of the floor of the neurocranium and the base of the posterior myodome. The bone ossifies from the medial belophragm and two lateral meningosts that form the wings. It is cartilaginous in Ostariophysi and lost in, e.g., Gadidae.

basiventral = the cartilaginous elements on the underside of the vertebral centra which enclose the haemal canal in Elasmobranchii and Holocephali.

basket = 1) a device to catch fish moving in a stream; made of wickerwork or wooden slats and usually trapping downstream migrants.

basket = 2) keepnet (a net lacking knots and supported with plastic or metal hoops, designed to hold fish caught by angling, usually in contests so the fish can later be weighed and released, or to keep fish fresh before transport and eating).

basket = 3) a basket used for carrying fish; a creel.

basket trap = a barrel-shaped trap, variously made of bamboo, wood, vines or wire netting, with funnel openings in series used to capture fishes.

basking = lying near the surface, usually with the dorsal and caudal fins exposed.

basnig = a type of lift-net suspended from a boat. Used in the Philippines, for example, where fish are attracted by a light over the spot where the lift-net is pre-positioned. See also stick-held dip-net.

basolateral = sides and base of a structure. In gills, refers to the sides not in contact with water.

basonym = basionym.

basophilous = thriving in alkaline habitats.

bass = 1) a common name for various, unrelated fishes including various large marine species (e.g. sea basses, Serranidae, temperate basses, Moronidae) and the more familiar sport fishes in North American fresh waters (*Micropterus* spp., Centrarchidae). Bass is derived from an Old English word.

bass = 2) a basket for carrying fish (Scottish dialect).

bass boat = a boat designed for bass fishing (*Micropterus* spp.). Has a large outboard motor, livewells, electronic location gear, raised casting platform in the bow and sometimes in the stern, and an electric trolling motor.

bass bug = large floating flies made of deer hair and/or cork bodies used to catch North American freshwater basses.

bass bug taper = a weight forward floating fly line with a short front taper and a short but thick belly so that bass bugs can turn over (straighten out).

bassalian = deep-sea.

bassel = bassle.

bassle = to splash or make quick movements as a fish on the water surface or in the bottom of a boat (Scottish dialect). Also spelled bassel or basel.

bastard = 1) small cod not large enough for commercial sale in Newfoundland.

bastard = 2) hybrid (from French and German).

bastard = 3) resembling a known kind or species but not truly such.

bat = a fishery on the Tweed River, so-named because the nets are hauled up on stones or bats as the bank is too high, e.g. Bailiffs bat, Davie's bat, etc.

batch = the quantity of fishery products processed under similar conditions over a distinct time period, always less than a day.

batch culture = a system for rearing animals and/or plants which involves the total harvest of the product by netting, draining or both, after a set period of time.

batch fecundity = number of viable eggs usually released by a batch spawner in one spawning.

batch spawner = a fish which sheds eggs more than once through a spawning season rather than within a short period (a fractional spawner).

bateau = a small, flat-bottomed boat squared off at each end with a lug sail (Newfoundland and Labrador).

bated = fish in good condition, plump, full of roe (English dialect).

Batesian mimicry = the condition where a rare and harmless species (the mimic) closely resembles a common and distasteful species (the model) and thus escapes being eaten as it deceives a predator (the operator).

bath = 1) bath treatment.

bath = 2) immersion in boiling water to cook and preserve canned fish.

bath treatment = diseased or parasitised fishes may be treated by immersion in a solution or in an aquarium having various concentrations of chemicals.

bathile = pertaining to the floor of a lake more than 25 metres below the surface.

bathometer = an instrument used to measure water depth.

bathyal = pertaining to or living on the sea floor at a depth range of 200-4000 metres, on the continental slope and rise. Other sources state 183-1830 m, 1000-4000 m, 200-3700 m or 100-1000 fathoms.

bathyal zone = the seafloor at bathyal depths.

bathybic = pertaining to life on the deep sea floor.

bathydemersal = living and feeding on the bottom below 200 m.

bathylimnetic = pertaining to the deep waters of a lake.

bathymetric chart = a map of a water body showing depth contour lines.

bathymetry = the measurement of depth and relief in a water body.

bathypelagic = pertaining to the mid-waters below the level of light penetration between depths of 2000 and 4000 metres (or 900-3700m, 1000-6000 m, 1000-4000 m or 1000-2500 m,

sources differ), e.g. *Cyclothona microdon*, *Argyropelecus aculeatus* and *Gastrostomus bairdi* are bathypelagic.

bathypelagic zone = the pelagic environment at bathypelagic depths.

bathyscaphe = a crewed, deep-sea diving chamber capable of descending to 10 km. Equipped with lights, observation ports and gear to collect specimens including fish.

bathysmal = pertaining to great ocean depths.

bathysphere = a spherical deep-sea diving structure capable of descending to about 900 m, now replaced by the bathyscaphe which is safer, more manoeuvrable and dives deeper.

batí = an cup in India used to measure carp fry or spawn, usually about 130-170 c.c., and containing up to a million eggs.

batings = the upper part of a trawl corresponding to the belly on the lower part. Also called baitings.

batteau = bateau.

batter = a mixture of dry ingredients such as flours or starches and water in a ratio suitable for coating seafood.

batter-coated fish = a prepared fish product, in the form of sticks or portions, coated with batter made from cereal products, a leavening agent and flavouring and partially cooked in hot oil to expand and set the batter. Also called batter-dipped and batter-fried.

batter-dipped = batter-coated fish.

batter-fried = batter-coated fish.

battered = fish product covered in a liquid mixture, usually egg and flour. This is usually partly cooked (pre-cooked) to set the batter in place before freezing.

battery = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for barracuda.

Battle of Herrings = a skirmish at Rouvray during the Hundred Years' War in 1429 over about 500 cartloads of herring under the command of Sir John Fastolf (probably a model for Shakespeare's Falstaff) the Duke of Bedford was sending to the army of the Duke of Suffolk besieging Orleans. The attack was beaten off by using the barrels as a barricade.

batty = a large catch of cod (Newfoundland).

Baudelot's ligament = a ligament connecting the upper end of the pectoral girdle with the first vertebra or the posterior end of the cranium. May be ossified and may be homologous with a first rib.

Bauhini's valve = a ring-shaped structure, the valvula Bauhini, sometimes found between the mid-gut and the hind-gut.

bauk = baulk.

baulk = a row of salmon fishermen with halve nets (*q.v.*) (Scottish dialect).

baulk net = a net that swings up to let fish in during the flood tide and then down as the tide ebbs, catching the fish.

baulker = balker.

Baumé = a scale in degrees named for Antoine Baumé, used for measuring density in liquids, e.g. in brines used for preserving fish, 22°Bé equals 100% saturation. For liquids heavier than water, to convert from °Bé to specific gravity at 60°Fahrenheit, specific gravity =  $145/(145 - {}^{\circ}\text{Bé})$ . Note that the Baumé scale also measures liquids lighter than water and the two scales do not overlap - 22°Bé (heavy) is not the same as 22°Bé (light).

bauplan (German) = a hypothetical, ancestral base plan for developmental patterning of the embryo.

bawb = to fish for salmon with a bob net (Berwick dialect).

bawb net = bob net.

bawber = one who fishes with an illegal bob-net, a salmon poacher (Berwick dialect).

bawley = a small fishing smack used on the coasts of Kent and Essex, generally about 15-20 tons, and no boom to the mainsail which is consequently easily brailed-up when working the trawl nets. Bawley's have a wet well to keep fish alive.

bawn = an area of beach rocks used for drying fish in Newfoundland. See also flake.

bay = a large and wide indentation in the shore of a lake or sea, larger than a cove, smaller than a bight or gulf.

bay price = the price paid for fish by a local outport merchant in Newfoundland.

Bayesian method = data analysed statistically with expert knowledge and beliefs. Bayesian methods make explicit use of probability for quantifying uncertainty. Bayesian methods are particularly useful for making decision analyses.

bayheads = fish livers and oatmeal (Scottish dialect).

baymouth bar = a bar extending partly or wholly across the mouth of a bay.

bayou = a term used in the southeastern U.S.A. for a bay, river channel, backwater, oxbow lake, creeks, marshy lakes, estuarial creek, lagoon, etc. characterised by sluggish or stagnant water, usually a secondary watercourse.

BC = 1) B.C. or before Christ. Used to designate years before the birth of Christ. Used in scientific dating for relatively recent events, e.g. fish remains in sub-fossil sites. Note there was no year 0.

BC = 2) abbreviation for buoyancy compensator.

BCD = abbreviation for buoyancy control device.

BCE = before the common era. Used to designate years before the birth of Christ in a non-Christian countries. Used in scientific dating for relatively recent events, e.g. fish remains in sub-fossil sites. Note there was no year 0.

beach = a sloped sediment shoreline composed of mud, sand, gravel, cobble or boulders, sometimes with beach rock.

beach boy = a boy employed at a fishing station to assist in curing fish on the stone beaches.

beach crest = the point at the limit of high tide storm wave run-up.

beach face = that part of a beach exposed to the action of wave uprush.

beach price = cost of fish at the landing point, not taking account of any transportation, handling or processing cost.

beach scarp = an almost perpendicular slope on the beach foreshore caused by the erosional action of waves.

beach seine = a net used to encircle fish in shallow water; usually operated by two people wading out from shore, the net has lead weights to keep the bottom on the sea floor and floats to keep the top of the net at or near the surface; there may be a bag extending back from the centre of the nets length to increase capture efficiency. The seine may be set from a boat but hauled in from the land. Also called shore seine, drag seine, draw net, haul seine, yard seine and sweep net.

beachmaster = a person responsible for curing and drying fish on shore in Newfoundland. Also called shoreman.

bead = small plastic or rubber balls with a hole through the centre used in angling for buffering lead weights and other structures in rigs, protecting knots, and to enhance noise in rigs.

beaded stream = a series of small pools connected by short segments of stream.

beadhead = a fly with a bead immediately behind the hook eye, helping the fly sink or float depending on the type of bead. Made of ceramic, brass, etc.

beak = the structure formed from teeth which are fused in the form of a beak, e.g. incisiform teeth in Scaridae used to detach coral pieces as food; in puffers upper and lower jaw teeth have a median suture, hence Tetraodontidae.

beam trawl = a trawl with short wings and a head rope attached to a metal or wooden beam 4-12 m long. The beam keeps the net open horizontally while metal frames on each end of the beam keep the net open vertically. The beam has metal runners to support it off the sea floor and the tapering bag net drags over the bottom. These trawls may have tickler chains to disturb the fish so the net does not ride over them. Experimental electrified ticklers have been developed to be less damaging to the sea bed. Beam trawls are used mainly for flatfish (and shrimp).

beam trawler = a vessel operating a beam trawl.

beard = barbels (archaic).

beat = 1) an area of waterside bank on either a river or lake, that is allocated to one or more fishermen for their exclusive use over a time period.

beat = 2) beet.

Beaufort wind scale = ranges of wind speeds which are reported as nautical miles per hour in marine weather forecasts while general weather forecasts report wind speeds in kilometres per hour. Beaufort values 13 to 17 have wind speeds in knots at 72-80, 81-89, 90-99, 100-109 and 110-118 without any verbal descriptions of sea conditions:-

Beaufort scale	State of air	Wind speed (knots)	Wind speed (km/h)	Sea conditions
0	Calm	0-1	0-1	Like a mirror
1	Light airs	1-3	1-5	Ripples
2	Light breeze	4-6	6-11	Small wavelets
3	Gentle breeze	7-10	12-19	Large wavelets, crests begin to break
4	Moderate breeze	11-16	20-29	Small waves, fairly frequent whitecaps
5	Fresh breeze	17-21	30-39	Moderate waves, many whitecaps
6	Strong breeze	22-27	40-50	Large waves begin to form, white foam crests more extensive everywhere
7	Near gale	28-33	51-61	Sea heaps up, white foam from breaking waves blown in streaks along direction of wind
8	Fresh gale	34-40	62-74	Moderately high waves of greater length, edges of crests break into spin-drift, foam blown in well-marked streaks along direction of wind

9	Strong gale	41-47	75-86	High waves, dense streaks of foam blown along direction of wind, crests of waves begin to topple, tumble and roll over, spray may affect visibility
10	Whole gale	48-55	87-100	Very high waves with long overhanging crests, foam in great patches blown in dense white streaks along direction of wind, surface on the whole becomes white, tumbling of the sea becomes heavy and shock-like, visibility affected
11	Storm	56-63	101-117	Exceptionally high waves, small and medium-sized vessels may be lost to view for long periods, sea completely covered with long white patches of foam along direction of wind, everywhere the edges of wave crests are blown into froth, visibility affected
12	Hurricane	>63	>117	Air filled with foam and spray, sea completely white with driving spray, visibility very seriously affected

beaver pond = water backed up by a beaver dam, forming a habitat for fishes or obliterating a stream habitat and so causing loss of fish diversity.

beaver tail = the tail of the beaver was classified as fish in the Middle Ages, giving rise to the riddle "What swims like a fish, tastes like a fish, is a fish, and yet is not a fish?".

beck = a small stream, often in a mountainous area, with a stony bed and/or a rugged course (Viking).

beckett == a tough piece of cord by fastening the hook to the snood in fishing for conger eels (Kent dialect).

bed = 1) the bottom of a water body.

bed = 2) a circular area on the bottom of a lake or river cleaned out by fish for spawning, e.g. various sunfishes and basses (Centrarchidae).

bed = 3) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for eels.

bedding-in = line on a reel becoming trapped under coils of line already wound onto the spool.

bedform roughness = a measure of the irregularity of a streambed.

bedrock = a water bottom formed of unbroken rock strata.

beef of the sea = dried and salted cod.

beel = a small and shallow lake (India).

beelerin' = a burn alive with trout (Scottish dialect).

been jal = a bag net set in a tidal current, supported by bamboo poles and with float supported lateral wings (India).

beet = mending the broken meshes of a net (Cornish dialect).

beeter = a woman who mends nets (Cornish dialect).

beetster = beeter.

before present = conventionally before 1950 A.D. Abbreviated as B.P.

behaviorotype = a joke term in nomenclature for the type of a taxon distinguished only by behavioural characters.

behead = removing the head of a fish.

beheaded stream = the lower part of a stream that has lost its upper part through diversion or stream capture.

behind = the position of a structure relative to another along the horizontal axis, e.g. a fin rearward of another fin. Not to be confused with beneath (underneath).

beikat = bykat.

bekko = ornamental carp or koi (*q.v.*), having black markings on a coloured fish.

beko disease = a microsporean infection in fish muscles.

belche = a line used in salmon fishing in the Severn River, England. It is used to pull up and close the net.

bell = gas bladder (a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, or, respiratory organ. Found in Actinopterygii. Often lacking in bottom fishes. Sometimes called swim bladder or air bladder, less appropriate terms).

bell buoy = a buoy equipped with a bell that sounds out with wave action.

bell sinker = a weight or sinker shaped like a bell. Also called casting sinker.

bellweather species = indicator species (a fish species whose status provides information on the overall condition of the ecosystem and of other species in that ecosystem; fish that are sensitive to environmental conditions and which can therefore be used to assess environmental quality).

belly = 1) the abdomen of a fish.

belly = 2) the bottom part of a trawl that drags along the sea bed.

belly = 3) the middle, constant diameter part of a tapered fly fishing line.

belly bloom = a ruptured belly wall in a fish that has severe belly burn.

belly boat = essentially a tube with a seat on which the angler sits, feet dangling in the water. The angler can fish in deep water and use scuba fins to move around.

belly burn = 1) damage to a fish abdomen through gut enzymes, especially seen in pelagic species.

belly burn = 2) a commercial measure of belly burn, from slight (not more than 25% of the belly wall affected and no part uncured), through moderate to high (over 50%, holes may be present, but not more than 10% of the belly uncured).

belly burst = perforation of the belly wall by action of gut enzymes; seen in fish that had been feeding and enzyme action was active before capture.

belly fin = pelvic fin (the paired fin which is located posterior, ventral or anterior to the pectoral fins (abdominal, thoracic or jugular in position). Also called ischiopterygium. It functions to steer, brake and propel the fish and acts as a keel. In the pelvic fin ray count usually all the rays are counted except a small ray preceding the first ray and usually bound so closely to it so as with reduced pelvics, the spine and the first ray may be bound together by a membrane and appear as one; both are counted, e.g. in Cottidae. Abbreviated as P2 or V).

belly flap = a loose piece of skin and flesh hanging from fish ribs in fish preparation. May be used for fat storage in some fishes.

belly line = a support and strengthening rope on each side of a trawl along the whole length of the belly.

belly sliding = an abnormal condition in a swimbladder that prevents the fish holding position in the water. Fish fry show this condition slide or hop along on their bellies and death results within a few days.

belly strip = a strip of meat taken from the belly of a bait fish. This strip can be trolled behind a boat and its fluttering attracts fish.

belophragm = the median ossification of the basisphenoid.

ben = silvery spring salmon of about 8 lbs in the Scottish Solway commanding a high price on the London market.

bench curing = dry salting (fish cured by stacking split fish between layers of salt so that they drain freely).

bench mark = a mark affixed to a permanent object to furnish a datum level, e.g. in tidal observations, river levels.

bend = 1) the curved portion of a hook, *q.v.* Also called shape.

bend = 2) an old word for a hook.

bend = 3) a sudden turn in the course of a water body, particularly a river.

bend = 4) to tie an artificial fly onto a hook.

bending-in = an old tradition at Brighton at the beginning of the mackerel-fishing season when a meal of bread and cheese is provided by the fishermen on the beach for all-comers.

bends = gas bubble disease (supersaturated gases (>125%) in water entering the body fluids of fish causing bubbles, an embolism). Also called Caisson's disease or decompression sickness.

Benson = a 29 kg common carp, *Cyprinus carpio*, who lived in a Cambridgeshire lake in England until her death in 2009. Voted "Britain's Favourite Carp" in 2005 by readers of the *Anglers Mail*, this largest carp in Britain had been caught by anglers more than 60 times. The fish was named for a hole in her dorsal fin likened to a cigarette burn. A companion fish, Hedges, stocked with Benson in 1995, escaped to the River Nene during a flood in 1998.

benthic = bottom-dwelling, pertaining to the sea, lake or river bed.

benthic cruising = the feeding mode of sturgeons, swimming over the bottom and sucking up food organisms with an everted mouth.

benthic pump = a deep-water upwelling that brings nutrient-rich water from the deep ocean to fertilise surface waters where phytoplankton, the basis of the marine food chain, thrive.

benthic-pelagic coupling = the cycling of nutrients between bottom sediments and the overlying water column.

benthivore = feeding on bottom-dwelling organisms.

benthon = a benthic organism.

benthonic = adjective from benthon. May be misused for benthic.

benthopelagic = pertaining to forms which hover or swim just over the floor of the sea, e.g. Halosauridae, Macrouridae, Moridae, Brotulidae; the depth zone about 100 metres off the bottom at all depths below the edge of the continental shelf.

benthophagy = feeding on benthos.

benthopotamos = living on the bed of a river or stream.

benthos = 1) organisms which live on the bottom of a water body, in it or near it.

benthos = 2) the bottom of a body of water including the sediment.

bentonite = a very fine clay often used to seal ponds.

benzoic acid = a food additive used to inhibit microorganism growth; restricted in use but is added to dried fish.

ber jal = a large seine net operated from boast on the Ganges River of India.

berg = an iceberg, a large piece of floating ice.

bergy bit = an iceberg the size of a house.

berley = any animal or plant matter spread in water to attract fish; groundbait (food used as an attractant for fish in angling. Bread crumbs is the most common base and a wide variety of additives and flavours are mixed in with anglers having their own recipes. Flavours can be sweet, spicy or fishmeal, for example). Also spelled burley in error.

Berlin method = a biological filtration for aquaria developed in Berlin and using live rock, *q.v.*, a protein skimmer, *q.v.* and powerful water circulation.

Berlin system = Berlin method.

berm = a natural or artificial levee (an embankment constructed to prevent a river from overflowing, or to contain a farm pond, or a natural embankment formed by sediment deposit during flooding).

Berners, Dame Juliana = reputed author of "A Treatise of Fysshynge with an Angle" from "The Boke of St. Albans" in 1496, the first evidence of fishing as a sport and the first literary treatment.

bernfisk = dried cod or ling used for preparing lutefisk (*q.v.*).

bernjoggel = a wooden fishing hook (Shetland Isles dialect).

berried = having berries (1).

berries = 1) sturgeon eggs as caviar. Also used for crustaceans.

berries = 2) salmon egg clusters enclosed in a mesh and used as bait in angling. When fresh, the egg cluster has a milky exudate that helps attract fish.

berry = one of the eggs of a fish or a crustacean.

berry fish = a cod with berry-like growth on the gills (Newfoundland).

berth (noun) = 1) a station on the fishing grounds assigned by custom or lot to a vessel, boat, crew or family (Newfoundland).

berth (verb) = 2) to place a fish net or trap in an inshore fishing station (Newfoundland).

Bervie cure = an old means of curing fish; split, brined fish heavily smoked with peat and partly decayed sphagnum moss which flamed up and cooked the fish. The product was a dirty blackish brown.

Berwick sauce = the water in which a salmon has been boiled, served as a sauce. Also called Dover sauce.

beryciform foramen = an opening in the ceratohyal of uncertain function in Beryciformes, sometimes reduced to a notch on the dorsal margin.

best fish swim near the bottom = valuable items are not obtained without trouble (slang). Some of the more tasty and desirable fish, like sole, are bottom swimmers.

bester = a hybrid between beluga (*Huso huso*) and sterlet (*Acipenser ruthenus*), a large but early maturing fish of potential use in aquaculture.

besting it = going to sea when the weather looks threatening, not setting out nets, and waiting to see whether the sky will clear or not (British dialect).

beta globulin = a blood plasma protein making up most fish immunoglobulins.

beta taxonomy = the process of arranging taxa into higher categories which reflect the evolutionary history of a group of organisms; phylogenetic reconstruction.

Bethsaida = the name of two villages, one on the western, one on the eastern, side of the Sea of Galilee, meaning "house of fish".

better = beeter.

better than a slap in the face with a wet kipper = a situation that could be considerably worse and hence one should be grateful.

Beukel, William = a fourteenth century Dutchman reputedly the first to pickle fish, hence pickle from his name (unlikely as pekel exists in medieval Dutch). Also spelled Bukelz and Beukelsen.

Beverton-Holt stock-recruitment model = a particular stock-recruitment formulation in which recruitment reaches an asymptote as stock size becomes very large.

bhasa-bada fishery = embanked saltwater marshes in India equipped with sluices to trap fish for growth and harvesting.

**biapocrisis** = how an organism responds to what it faces where it lives. Responses include reproducing, growing, moving, surviving, or not.

**bi-** (prefix) = two, twice or double.

**bi-fly** = any fly in angling which can be fished wet or dry.

**bi-nomenclature** = binominal nomenclature.

**biannual** = occurring twice a year. Compare biennial.

**biasotype** = a joke term in nomenclature for the type of a taxon determined only by a detailed statistical analysis of a small sample.

**bibliographic error** = in nomenclature, an error in the citation of the place of publication of a scientific name, e.g. page number.

**bibliographic reference** = the citation of the author's name and date of publication for a scientific name.

**bibliography** = an exhaustive list of references on any topic.

**bicentric distribution** = the presence of a taxon in two widely separated geographic areas.

**bicht** = bucht.

**bichter** = bighter.

**bicolour** = two-coloured.

**bicuspid** = with two points or cusps, usually applied to teeth.

**bid** = the end of the line or gut to which the hook is attached in fly-fishing (Shetland Isles).

**bident** = a fish spear with two prongs. The trident is more familiar.

**biennial** = occurring every two years, lasting two years. Compare biannual.

**bifid** = divided in two, e.g. a forked preopercular spine.

**bifurcate** = divided in two, forked.

**bifurcation** = a node in a tree connecting three branches. If one branch is directed or rooted, then one branch represents an ancestral lineage and the other two branches are descendent lineages. Also called dichotomy.

**big fish** = 1) a large fish.

**big fish** = 2) an important or influential person.

Big Fish = 3) a movie released in 2003, directed by Tim Burton, starring Ewan McGregor and Albert Finney. Based on the novel *Big Fish: A Novel of Mythic Proportions* by Daniel Wallace.

big fish day = a successful day of fishing for cod in Newfoundland.

big fish in a small pond = having a lot of influence over a small area.

bigd = a fishing lodge or stone huts in which fishermen lived during summer in the Shetlands (dialect).

big-game fishing = catching large marine fish for sport from a boat using a variety of heavy tackle.

big-game reel = any fishing reel that is large and made for marine trolling.

bigg = a fishing lodge (Shetland Isles dialect).

bigger fish to fry = something better or more important to do.

bight = 1) an indentation of the coast forming a large open bay.

bight = 2) the part of a line between the end and the standing part on which a knot is formed.

bight = 3) bucht.

bighter = the small stone attached to fishing lines to keep them down under water (Scottish islands dialect). Also spelled bichter.

bike seat = butt seat.

bilaterally symmetrical = capable of being halved in one plane such that the two halves are mirror images. All vertebrates, including fish, show this symmetry. Useful in that damage to structures of interest on one side need not make them inaccessible, e.g. scale counts.

bile house = boil house.

bilge water = water that collects in the bottom of a ship. Important in transportation of fish species into new localities where such exotic species may have devastating effects on native species.

bilgy fish = a foul smelling fish caused by rapid growth of anaerobic bacteria. Occurs when fish are stored under conditions where air is excluded, e.g. pressed against the side of a warm container. Also called stinker.

bill = 1) rostrum (a snout-like extension of the head).

bill = 2) the wages or share of the profit of a fishing voyage paid to men after deduction of expenses (Newfoundland).

billabong = an isolated pool, a stream filled with water only in the rainy season, or a backwater (Australia).

billfish = a general term for those fishes having a bill, e.g. swordfishes, Xiphiidae.

Billingsgate Fish Market = the famous London fish market, in the nineteenth century the largest in the world.

Billingsgate language = foul or abusive language from Billingsgate, where the notorious fishwomen assemble to purchase fish.

billy-tub = a cut down barrel used for housing trawls or bait (Newfoundland).

bilobate = two-lobed; with two rounded projecting parts.

bilobed = divided into two lobes.

bilocular muscular stomach = a special stomach characterised by the presence of a large aponeurosis (flat tendon) at the bend of the stomach, the centrum tendineum. In this type of stomach the lesser curvature is usually considerably expanded and can no longer be designated as an angulus or fold. The musculature (mm. laterales (ventriculi)) radiates out fan-like from both sides of the centrum tendineum, producing two thick swellings and giving the whole structure the form of a laterally flattened egg, e.g. in Mormyridae.

bim = a grade of dried and salted cod shipped to the West Indies from Newfoundland.

bim fish = bim.

bimaxillary = premaxilla (one of the paired, superficial, usually toothed, dermal bones of the upper jaw, proximal or anterior to the maxillaries; in primitive Teleostomi they comprise the middle, in more advanced forms they may comprise the whole, of the oral edge of the upper jaw. Teeth may be present. In Diodontidae, the premaxillae are ankylosed and form a single bone. Absent in Chondrostei. In Holostei (*Lepisosteus* and *Amia*) the bone has two ossification centres and therefore is a double bone. Holostei and Teleostei have an ascending process anteriorly but these may not be homologous. Posterior to the ascending process in Teleostei there may be an articular and a postmaxillary process, and a posterior extension, the caudal process. Also called premaxillary, surmaxillary, or intermaxillary).

Bimini twist = a knot used in offshore trolling and double-line leaders. It forms a long loop of line stronger than the line itself for protection against abrasion. Various websites have animated steps showing how to tie this knot.

bin = a large compartment in a vessel for holding fish.

binary diet = dry ingredients, minced fish and fish oil prepared daily at a fish farm.

binary name = binomial name.

binary nomenclature = binominal nomenclature.

bind = 1) a quantity of 250 eels in 13th to 16th century England. Ten stikes makes a bind (each stike being 25 eels). Also used for other fish such as salmon. Also spelled binn.

bind = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for eels.

bind = 3) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for salmon.

binder = a substance in fish feed used to hold the constituents together.

bined = a fifteenth century word for dressing sole (preparing this fish for consumption), no longer in use.

binn = bind (1).

binner = the person who catches fish by binning.

binnick = a small fish (English dialect).

binning = a method of catching trout by hitting rocks in a stream with a sledge hammer. This stuns the fish and enables the fisher to pick them up.

binomen = the combination of a generic (first word with its initial letter capitalised) and a specific name (second word, always lower case) which together constitute the scientific name of a species; any interpolated names are not counted as components of a binomen. Also called binomial name.

binomina = plural of binomen.

binominal = having two scientific names.

binomial name = binomen.

binomial nomenclature = the system of nomenclature in which a species, but no taxon or any other rank, is denoted by a combination of two names.

binoro = small fishes brined, drained and packed in dry salt (Philippines).

bio- (prefix) = life.

bio-ball = a plastic ball used as a filter medium in aquaria; a colony of bacteria on these balls act as a biological filter. Balls have the largest surface area for bacterial colonisation and filtering effect.

bio-economic equilibrium = the simultaneous biological and economic equilibrium in a fishery. In a single stock model, the biological equilibrium condition is that the rate of change of the stock be zero. The economic equilibrium condition is that there be no change in fishing effort. The driving force of effort is profit (or loss). In an open access fishery, the bio-economic

equilibrium is given at an effort level where profit is zero and total fishing cost is equal to total revenue.

bio-economic modelling = a model establishing functional relationships between specific characteristics of the fishery resource and the activities of mankind to make use of such resource. It facilitates management decisions. As an abstraction from reality, the validity of a bio-economic model depends on the explicit or implicit assumptions about the biological and human processes it represents.

bioaccumulation = the concentration of toxic compounds in water through the food chain. As fish are often the final link in the chain, they may accumulate levels of chemicals in their flesh that are harmful to them and to humans. Even non-fatal levels may affect behaviour, growth and reproduction.

bioassay = 1) the use of an organism for assay purposes.

bioassay = 2) any quantitative biological analysis.

bioavailable = that part of a chemical contaminant in water, sediment, suspended matter or food which is in a form that can be taken up by a fish.

biocenose = the balanced association of animals and plants in a biotope, a natural assemblage; strictly the animal and plant associations excluding the physical aspects of the environment and so not the same as ecosystem. Also spelled biocoenose. Also called biocoen, biocoenosis or life assemblage.

biochemical oxygen demand = biological oxygen demand.

biochore = a group of similar biotopes.

biochrome = a type of chromatophore with natural pigments producing colours chemically, cf. schematochrome.

biocide = a chemical lethal or toxic to living organisms.

biocoen = biocenose.

biocoenosis = biocenose.

bioconcentration = the net accumulation of a chemical in tissues of a fish to levels greater than in the surrounding medium. This seems to be identical with bioaccumulation; the various definitions of both these terms being similar or different depending on the source - bioaccumulation may not involve the food chain in some definitions for example.

biodiversity = the variety and variability of living material in a given area (terrestrial and aquatic) in terms of genes, species and ecosystems. Also called biological diversity.

biodiversity hot spot = an area with an exceptional number of species including many endemics. See also hotspot.

**bioencapsulation** = the process of incorporating nutrients or medicines into living organism that can then be fed to the target fish, e.g. polyunsaturated fatty acids, important in early larval development, can be encapsulated in rotifers for feeding to marine fish larvae.

**bioenergetics** = the study of energy flow through ecosystems.

**biofilm** = 1) in the aquarium, a slimy and thin layer produced and inhabited by bacteria which carry out certain biochemical processes essential to the nitrogen cycle, *q.v.*

**biofilm** = 2) in the natural environment, *aufwuchs* (organisms and detritus coating rocks and plants in an aquatic environment often fed on by fish specialised as scrapers).

**biogenic** = changes in the environment caused by activities of living organisms.

**biogenic amines** = a type of amine formed from decarboxylation of amino acids in spoiled fish by the action of bacteria at temperatures above 10°C. Includes histamine (from histidine), cadaverine (from lysine), putrescine (from arginine), agmatine, spermine, spermidine and tyramine. Histamine causes scombrotoxism, *q.v.*

**biogeographic province** = a geographic area having unique physical and biological properties that affect the spatial distribution of organisms and their habitat.

**biogeography** = 1) the distribution of species defined by abiotic factors such as salinity, temperature, currents, etc.

**biogeography** = 2) the distribution of organisms defined by historical events such as migration, extinction, speciation, etc.

**bioload** = decaying algae, plants, fish food and excreta, etc that increase nitrites and ammonia in a fish pond.

**biological diversity** = the variety and variability of living material in a given area (terrestrial and aquatic) in terms of genes, species and ecosystems. Also called biodiversity.

**biological filtration** = aquarium filters using bacteria to break down wastes via the nitrogen cycle, *q.v.*, into materials less toxic to fish.

**biological fishery resource** = a resource of value to fisheries.

**biological indicator** = a fish whose presence in a water body is indicative of certain environmental conditions.

**biological integrity** = the capability of supporting and maintaining a balanced, integrated and adaptive community of organisms. The community is one that a natural habitat of a region would support.

**biological interaction** = an interaction between species or stocks resulting from direct predation or competition for food or space, or both. Fishing will have strong impacts on other associated or dependent species.

biological loading = the burden placed on an aquarium ecosystem by the fish inhabiting it. A high loading means the equilibrium is more easily disturbed. Factors include physical space for fishes, surface area (and thence oxygen), the space available to nitrifying bacteria (see nitrate poisoning), etc.

biological noise = noise produced by living organisms such as fish.

biological overfishing = fishing levels higher than those required for extracting the maximum sustainable yield of a resource and when recruitment starts to decrease statistically. Spawning potential and stock biomass is below safe levels.

biological oxygen demand = a measure of the quantity of oxygen needed to incorporate or oxidise organic waste material into the environment or a measure of oxygen consumption over a fixed time period. A high demand will restrict the fish fauna. Abbreviated as BOD.

biological reference point = a fishing mortality rate or biomass that may provide acceptable protection against growth overfishing and/or recruitment overfishing for a particular stock. It is usually calculated from equilibrium yield-per-recruit curves, spawning stock biomass-per-recruit curves and stock recruitment data. Target reference points represent a desired level of fishing mortality or biomass while limit reference points represent either an upper boundary to the fishing mortality or a lower boundary of the biomass. Examples are  $F_{0.1}$ ,  $F_{MSY}$ ,  $F_{max}$  and  $F_{med}$ .

biological species = a species differing negligibly in morphology but remaining distinct because of ecological, physiological or ethological factors.

biological survey = collecting, cataloguing, processing and analysing a representative portion of the resident aquatic community to determine its structural and/or functional characteristics or the biodiversity.

biologically acceptable limit = value of a critical biological indicator, e.g. spawning biomass, considered as the limit below which the stock sustainability cannot be ensured, or below which the probability of a negative outcome such as stock collapse is unacceptable. Also referred to as biologically safe limit.

biologically safe limit = biologically acceptable limit.

bioluminescence = light produced by an organism where chemical energy is transformed into light energy.

biomagnification (biological magnification) = a cumulative increase in the concentrations of a persistent substance in successively higher levels of the food chain; in aquatic environments fish are often the terminus of a food chain and have the most chemicals accumulated (PCBs may accumulate by a factor exceeding 250,000 that in water).

biomass = the weight, volume or energy of living material in a given area, sample, fraction such as spawners, stock or for one or more given species (species biomass), or of all the species in a biotic community (community biomass). In fisheries the weight of a fish stock or some defined part thereof; abbreviated as B. The biomass of a fishable stock (available to fishing gear) is the exploitable biomass.

biomass at MSY = the long-term average biomass value expected if fishing at  $F_{MSY}$  (the fishing mortality rate which, if applied constantly, would result in maximum sustainable yield. Can be estimated from simple biomass-aggregated production models or from age-structured models that include a stock-recruitment relationship). Abbreviated as  $B_{MSY}$ .

biomass set asides = a portion of a potential harvest set aside for some purpose other than being part of the catch. It is subtracted from the maximum sustainable yield to arrive at an allowable harvest. This reserved portion may be set aside as food for birds and marine mammals, for a trophy fishery, for research, etc.

biomass-weighted F = an estimate of fishing mortality in which F estimates for each age group are weighted by corresponding stock biomass at age. Used to make average F estimates from age structured assessments comparable to those obtained from surplus production modeling of all stock components.

biome = ecological regions as a result of complex interactions of climate, geology, soil type, water resources and latitude.

bionomics = the relation of an organism or a population to the environment and its organisms.

biophilia = a natural affinity for wildlife by humans.

bioregion = a region of the Earth with a distinctive environment and living organisms, for example a river catchment.

bioseston = the biological component of seston (particulate organic matter such as plankton, organic detritus and inorganic particles such as silt).

biospecies = a species in the sense of the biological species concept as a closed community of reproduction with a closed gene pool, i.e. reproductively isolated. Only applies to organisms that occur together at the same time and place and so does not permit assessment of allochronic and allopatric populations.

bioswale = landscaping designed to remove pollution and silt from surface runoff. The design allows maximum retention time for water to allow removal of pollution and silt and includes vegetation, compost and ripraps. May allow for some fish habitat.

biota = 1) all living organisms of a region.

biota = 2) as the adjective, influences caused by living organisms.

biotic = the adjective for biota.

biotic potential = the maximum rate that a population can increase when there are no limits on rate of growth.

biotin = a B-complex vitamin, a deficiency of which in fishes causes convulsions, reduced mucus production and blue slime disease.

**biotope** = an independent space of variable size with a unique ecology and environmental conditions necessary for survival of the species constituting the biocenose.

**biotope aquarium** = an aquarium set up to mimic or resemble a particular biotope, e.g. a blackwater pool.

**biotoxin** = a natural toxin or poison produced by fish and other organisms, often as a defensive measure. See also toxin, poisonous fishes and venomous fishes.

**bioturbation** = the disturbance and re-working of bottom sediments by organisms that nest, live in or feed in or on the sea bed.

**biotype** = a particular combination of parental genomes. Unisexual biotypes are given hyphenated names that reflect their hybrid origin, e.g. *Poeciliopsis 2 monacha-lucida* is a triploid with a *monacha* x *lucida* x *monacha* ancestry.

**biotypus** = a clone or all individuals in a pure line; an obsolete, non-nomenclatural term.

**biozone** = the zone capable of supporting life.

**biparental** = both parents raising young.

**bipolar** = 1) said of distributions that are discontinuous between the northern and southern hemispheres (not necessarily in the polar regions).

**bipolar** = 2) occurring in both the north and south polar, regions, but not in the intervening area, e.g. certain Gadidae, Cyclopteridae and Cottidae.

**bipolar cell** = a cell in the eye which transmits the information generated by photoreceptors to the inner retina, i.e. primarily the retinal ganglion cells.

**birch drum** = a cylindrical wooden container in which dried Newfoundland cod were packed for the trade with Brazil.

**bird** = a paravane stabiliser or roll-damping device on small to medium-sized trawlers of the Northwest Atlantic, rigged on booms extending out from both sides of the trawler and towed by cables or chains a few metres below the sea surface. Also called flopper stopper.

**bird fishery** = 1) a fishery on Dojran Lake shared between Greece and the former Yugoslavia. Migrating birds feed on the fish in the shallow lake except where fishermen build a fenced area, open to the lake but kept free of birds by a watchman. Fish retreat to this protected area. Some of the birds, such as mergansers and crested grebes, are caught and their wings clipped. The entrance to the fenced area is closed off and the flightless birds are released into the area which has been divided into 20-30 chambers by loose mats, through which fish can swim but not the birds. The birds dive in the first chamber where they were released, chasing the fish from this chamber to the next. Fish too large for the birds to eat and too large to pass through the mats are left to be speared by the fishermen. The birds are then moved to the next chamber after access to the first one is blocked off by dense mats, and the process is repeated. All the fish in the last chamber are removed by a fyke-net.

bird fishery = 2) a less well-known use of birds is found on south Kalimantan in Indonesia. Ducks have been trained to chase the fry of snakeheads (*Ophiocephalus* sp.). The parents of the fish will then chase the duck to protect their fry, the duck is retrieved on a line, and the snakeheads snap at unbaited hooks in anger, thus being caught.

birdnet = a net around or over aquaculture facilities to prevent predation on fish by birds.

birdnest = birdsnest.

birdsnest = line on a reel entangled around the spool, or any bad tangle of fishing line.

birth rate = ratio of birth to population, usually a percentage.

birth-pulse population = a population assumed to produce all of its offspring at an identical and instantaneous point during the annual cycle.

birthing ground = the area where live-bearing (q.v.) fish give birth, often a shallow marine bay protected from predators. See also pupping ground.

biserial = 1) arranged in two rows or series.

biserial = 2) specifically in the fin bearing both preaxial and postaxial radials, long projecting bones, e.g. in Dipneusti.

bisexual = species in which both male individuals and female individuals are found; gonochoristic. See also unisexual.

Bismarck herring = whole herrings or blocks of herring fillets, without heads or guts, cured in acidified brine then packed with brine of low vinegar and salt content, sugar, sliced onions, cucumbers, carrots and spices such as pepper and mustard.

bisubtropical = occurring in both the northern and southern subtropical zones.

bit = bite (4).

bit of fish = coition (nineteenth century slang).

bite = 1) bight.

bite = 2) taking of bait by a fish. Also called bump, hit and strike.

bite = 3) the straight part after the bend on a hook, q.v. Also called spear.

bite = 4) a small piece of fish breaded or coated with batter, weighing less than 1 oz. Of various shapes such as round, square, or irregular. May be cut from regular blocks or blocks of minced fish. Generally sold by count, 25-35 per lb. Also called cubes, nuggets, petites, and tidbits.

bite alarm = any device that helps detect a fish bite on angling gear. Electronic units detect the speed and movement of line and have a buzzer or light. Older methods include floats and bobbers.

bite indicator = bite alarm.

bitemperate = occurring in both of the temperate regions of the globe but not in the intervening area, e.g. *Hexanchus*, *Lamna*, *Zeus*, *Sebastes*.

biter = a piscivore that bites off a part of its prey, e.g. piranhas.

biting = fish taking bait or lures.

bitter = a bitter taste is found in spoiled fish caused by bacterial degradation of proteins to bitter peptides. Urea found in Elasmobranchii has a bitter taste.

bitypic = an unofficial term in nomenclature for a taxon including only two immediately subordinate taxa, e.g. a genus with two species.

biverbal = pertaining to a name comprising two words that is not a binomen, *q.v.*, according to the provisions of the International Code of Zoological Nomenclature.

bivie = a domed tent with a large opening so that anglers can fish from it but be protected against rain; usually green and strong to stand up to windy days. Popular in England!

bivoltate = two generations per year.

bivoltine = bivoltate.

bivvy = bivie.

blachong = balachong (a fermented and salted fish paste from Malaysia. See also garum, balachong and trāsi).

black ball = a marker attached to a trawl buoy for identification (Newfoundland).

black box = an automatic and electronic communication and location device placed on fishing vessels. Used to manage fisheries by monitoring date, time and vessel position, through a vessel identification number, in real time using satellites. Also called vessel monitoring system.

black carps = small carps or Chinese carps.

black caviar = a semi-preserve. grainy caviar, also known as dry caviar or pickled grainy caviar, and pressed caviar where the liquid is reduced for longer keeping.

black chin = a condition seen in aquarium cichlids, particularly those from the African Great Lakes, where the chin develops small grey-black spots or blotches which may spread back to the pelvic fins. May be related to high nitrate as the species involved are from low nitrate habitats (aquaria with nitrate <25 p.p.m. generally avoid this problem).

black fish = 1) commercial quantities of fish landed illegally.

black fish = 2) dark-coloured fish caught for food, e.g. fish in the Tonle Sap, a lake in Cambodia, that live there year-round and survive adverse conditions, cf. white fish (2). Taxa include *Clarias*, *Channa*, *Anabas*, *Oxyeleotris*.

black fish = 3) fish recently spawned (Scottish dialect).

black fisher = a fish poacher.

black fishing = fishing illegally by night, often using torches.

black grub = black spots in the skin of fishes caused by metacercariae of such trematodes as *Uvilifer ambloplitis*, *Cryptocotyle lingua* and others. Also called black-spot disease, q.v.

black haul = a fishing trip without any catch being made.

black herring = 1) a kind of cured herring, possibly smoked with stinging nettles and hay.

black herring = 2) mistaken or diversionary racial profiling in allusion to the expression red herring, q.v.

black lining = a black peritoneum (plural peritonea)(a membrane covering the body cavity (coelomic cavity) including the viscera. Often its color, light, speckled or black is of taxonomic significance. There are visceral and parietal peritonea, q.v.).

black mud = the sediment found in swamps, poorly managed fish ponds and in uncleaned tanks, rich in hydrogen sulphide and organic matter, and very foul smelling.

black nape = black lining, e.g. the nape of salted dried fish from which the thin back membrane has not been removed.

black oil = oil made from livers of haddock and other fish (Scottish dialect).

black salmon = kelt or a dark adult Atlantic salmon that has spawned but not yet regained weight or the silvery colour.

black smoker = a vent in a geologically active area of the ocean floor. Superheated water laden with sulphide minerals supports an ecosystem including fishes. See also hydrothermal vent and white smoker.

black tail disease = whirling disease (a parasitic disease of trout caused by the myxosporidean protozoan *Myxosoma cerebralis*. The parasite enters spine of the fish at a stage before the cartilage has turned to bone. Causes bent spines which force the fish to swim in the characteristic "whirling" motion, that is also called tail hunting. The spores of the parasites can remain in the mud of ponds for a long time. Also called twist disease).

Black Water = an Indian term for the sea. Indians lost caste if they crossed the sea. See also blackwater.

black wing = dried salted split cod which has not been white naped and which has gone stale.

black yarn = an unsuccessful fishing trip (Scottish dialect).

black-spot disease = the encysted intermediate, metacercarial life history stage of a strigeid trematode (*Uvulifer ambloplitis*, and also *Cryptocotyle lingula*) found in a fish's skin, gills and eyes. The skin develops black to brown pigment over the cysts forming the characteristic spots. Usually harmless to fish unless very severe, but unsightly and commercially a problem. Herons and kingfishers are the definitive host and snails are an intermediate host. See also black grub.

blackberry = the parasitic copepod *Lernaeocera branchialis* found under the gills of cod, resembling a crowberry (Newfoundland).

blackberry fish = blackberry.

blackberry odour = an odour found in some fish flesh caused by dimethylsulphide formed from dimethyl-β-propiothetin in the diet when fish feed on pteropods such as *Spiratella retroversa* and *S. helicina*, e.g. in mackerel and cod respectively. Resembles a sulphide, gunpowder or paraffin-like odour. Also called weedy odour.

blacken = to coat fish with pepper or other spices and then searing the fish in a skillet to produce a blackened outside and tender inside.

blackening = 1) a black discolouration of canned fish caused by defects in the lining of the can such that sulphides in the flesh interact with the can steel to form black iron sulphide.

blackening = 2) black discolouration in *Molva dypterygia* caused by the ink bag parasite, a copepod (*Sarcotaces arcticus*), which has an ink bag that may be perforated during filleting. The parasite can be cut out of the fish without staining the surrounding flesh.

blacklisting = the identification of waters where fishing is prohibited because the fish are contaminated, e.g. with heavy metals.

blacksmith = an old halibut with a very dark colour (Scottish dialect).

blackspot = 1) cysts of the intermediate stages of trematodes found in the skin of fishes, black because of melanin deposits by the fish (see black-spot disease).

blackspot = 2) a dense school of fish below the water surface.

blackwater = 1) very soft water, rich in humic acids and poor in nutrients with minimal transparency. pH is around 3.5-4.8 and colour is stained by tannins. Found in tropical areas especially and supporting a distinct fish fauna. Called cedar water in the eastern U.S.A. See also Black Water.

blackwater = 2) water with human, animal and food wastes. See also Black Water.

blackwater extract = a water conditioner for aquaria meant to imitate blackwater (1).

bladder = gas bladder (a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, sound receptor, respiratory organ. Often lacking in bottom fishes. Sometimes called swim bladder or air bladder, less appropriate terms). bladder queue = 1) a row of floats indicating a drift net.

bladder queue = 2) a line up of people outside a bathroom (slang).

bladder queue = 3) a row of balls awaiting inflation at a sporting event (slang).

bladdery = resembling or like a bladder, possessing a bladder or bladders.

blade = 1) the anterior dorsal fin rays fused into a blade-like structure in members of the Argyropelecidae.

blade = 2) a leaf-like structure.

blade = 3) an arched, convex cutting edge without cusplets, e.g. in shark teeth.

blade bait = 1) in angling, any spinner or spoon with a rotating blade.

blade bait = 2) a weighted, fish-shaped blade with a swinging hook, designed for fishing deep.

blaem = said of fish showing at the surface of the water (Scottish dialect).

blagda = a long piece cut from the belly of a fish and used as bait (Scottish dialect). Also spelled blaget.

blaget = blagda.

blah blah fishcakes = an expression used to deride or summarily dismiss any tedious speech, conversation, or situation. English version of yadda, yadda, yadda.

blaisse = blase (1 and 2).

blaize = blase (1 and 2).

bland fish protein concentrate = concentrate with lipids, odour and flavour removed under hygienic conditions (see fish protein concentrate). Abbreviated as bland FPC.

bland FPF = bland fish protein concentrate.

blank = 1) a fishing rod without grip, guides or finish.

blank = 2) an unsuccessful fishing season or trip.

blanket net = a type of liftnet suspended by one end from a boat and pulled in from the bottom by a line from the boat deck.

blase = 1) a torch used to see salmon for spearing at night (Scottish dialect). Also spelled blaisse, blass and blaize.

blase = 2) the act of using a blase (Scottish dialect).

blass = blase (1 and 2).

blast fishing = dynamite fishing (the use of explosives to kill and stun fish for capture. Used on coral reefs where nets cannot be operated without becoming tangled or ripped. Obviously illegal almost everywhere. Has been used by ichthyologists as a sampling method).

blast freezing = freezing fish products by circulating cold air over them.

blasting = fish bombing (home-made bomb made from an empty glass bottle filled with fertiliser and kerosene used to stun fish on coral reefs for capture and sale in the aquarium trade).

blastocoel = the cavity of the blastula; segmentation cavity.

blastoderm = early embryonic tissue composed of blastomeres arranged in a sheet-like fashion; used to refer to embryonic tissue before embryonic axis formation.

blastodisc = the early embryo of Teleostei comprising a disc or cap of cells on the yolk.

blastomere = individual cells forming the early embryo of Teleostei.

blastopore = a circular area on the yolk of Teleostei eggs not covered by the advancing germ ring during epiboly.

blastula = the single-layered, hollow ball of cells, the final product of cleavage stages in the embryo characterised by formation of the blastocoel.

blawn = dried in the wind (Shetland Isles dialect).

blaze = 1) to catch salmon by torchlight, by striking them with a leister (*q.v.*) (British dialect).

blaze = 2) the torch used in salmon spearing (British dialect).

bleaching = a condition seen in fish skin where colour is lost through storage in water, in water thawing or in melting ice.

blebs = the enlargements of the afferent filament blood vessels in the outermost region of the interfilamentous gill septa. It is possible that the blebs function to smooth the pulses and provide a uniform flow of blood through the secondary lamellae (Fromm, 1974). Also used to describe a skin vesicle containing fluid.

bled cod end = a net which allows discard of fish from its end before the net is brought completely on board.

bleeding = the draining of blood before freezing a fish, by cutting off the tail or by cutting the throat region. Used in production of high quality fish and to improve shelf life.

bleeding new = a metaphor borrowed from fish, which will not bleed when stale.

bleese = blaze.

bleeze = blaze.

bleg = a long piece cut from a fish, especially the belly, and used as bait (Scottish dialect). Also spelled blig, blegg, blegdt and bligg.

blegdt = bleg.

blegg = bleg.

bleggy = fish bait (Scottish dialect).

blessing the nets = a Christian ceremony in England, and elsewhere, where the nets used by fishermen are blessed to ensure a good harvest and a safe fishing season.

bleyan = a fish that has been bitten and sucked by another (Scottish dialect).

blig = bleg.

bligg = bleg.

$B_{lim}$  = limit biomass, the minimum level of spawning stock biomass. Below this level there is a higher risk that the stock will suffer a severe reduction in productivity. See also precautionary approach,  $F_{pa}$ ,  $B_{pa}$  and  $F_{lim}$ .

blimp = a short horizontal line on a sonar indicating fish presence.

blind casting = casting without seeing a fish, using knowledge of the water and likely locations fish are to be found.

blind lake = a lake without inflowing or outflowing streams.

blind river = a river without a terminal basin or outlet to the sea, ending usually in a desert.

blind side = said of the side of flatfishes without eyes that rests on the bottom; also called lower surface but not ventral surface because it is one of the flanks of the fish. Opposite of eyed side, *q.v.*

blind snatching = impaling a fish on a hook, without the fish taking a bait into its mouth, and when the fish is not seen by the fisherman.

blinder = a small meshed lining acting as a chafer for the cod-end of a trawl.

Blinky = a three-eyed fish making sporadic appearances on the The Simpsons television show; formed by mutation through radioactive wastes from a nuclear power plant.

bloat = 1) a fish floating belly up, tail up or head up due to an inability to control gas exchange in the swimbladder.

bloat = 2) Malawi bloat (a condition similar to dropsy (*q.v.*) seen in cichlids from the East African rift lakes (originally those from Lake Malawi). Progress is more rapid than in dropsy. Fish show lethargy, appetite loss, increase respiration,, gasping at the surface, abdominal swelling, with death in less than 3 days. Causes are uncertain but include bacterial infection and poor diet).

bloat herring = bloater (1).

bloater = 1) a lightly salted, unsplit, hot-smoked herring or cisco. Usually of a straw colour and may be marketed whole or boned, frozen, or semi-preserved as paste or canned.

bloater = 2) the salmonid *Coregonus hoyi*, a cisco of the North American Great Lakes so-called because of the swollen body resulting from expansion of the swimbladder when the fish is hauled up from great depths.

bloater paste = fish paste made of ground meat from bloaters (usually slightly smoked salted herring).

bloater stock = barrel-salted herrings on board a ship, for later smoking.

blob = a ball-shaped and brightly coloured lure with hairy extensions like a classical fly, pulled quickly through the water. Very effective, especially for trout, and decried by fly fishers because it does not resemble any natural food. See also booby.

block = 1) frozen fish fillets in a rectangular shape, weighing 7.4 kg as a standard.

block = 2) a fragment of sea ice 6-30 feet across.

block = 3) equipment to raise the flukes of an anchor to the gunwale. Also called fish tackle.

block = 4) a mechanism used with fish-tackle for raising heavy objects. Consists of a wheel with a groove in which a rope can run to change the direction or point of application of a force applied to the rope.

block fillet = a fillet comprising muscle mass from the side of the fish, usually joined at the back or belly. Also called angel fillet, cutlet, double fillet or when smoked golden cutlet.

block frozen = a mass of fish frozen as a block in a box, rather than frozen as individual fish.

block-end feeder = a tube with one end blocked, the other removable for adding particle baits such as maggots and hemp, and pierced with holes allowing gradual release of the bait into the water.

blocked quota shares = shares in a fishery that cannot be subdivided if transferred. The blocked quota has a size limit and the number of blocks an individual can own is limited in a given area. This ensures small units are available for purchase by new entrants to the fishery.

blogaben = the bone below the gill of a fish; the lug bone (*q.v.*) (Scottish dialect).

blood bight knot = a knot used in angling to form drop loops for attaching weights or a dropper line. Various websites have animated steps showing how to tie this knot.

blood clot = in commercial preparations of fish products, a measure of the number and area of blood clots in relation to the size of the fish.

blood end = 1) the part of the sound bone (*q.v.*) of a cod which is removed when the fish is split or the portion of the flesh adhering to the bone and cooked as a delicacy (Newfoundland).

blood end = 2) the end of the sound bone (*q.v.*) closest to the tail (Newfoundland).

blood island = a nest of developing blood cells arising late in the segmentation period from the intermediate mass, located in the anterior-ventral tail just posterior to the yolk extension.

blood knot = a knot in angling used to connect to pieces of line of the same thickness. Its form allows it to run smoothly through the rod rings or guides. Has strength of 65%. Generally not recommended. Various websites have animated steps showing how to tie this knot.

blood line = a line of blood along the backbone of fish being cleaned. It is removed in processing before the fish is frozen or prepared further.

blood meal = animal blood processed into meal and used as an inexpensive supplement in fish feeds, e.g. usually less than 10% in salmonid feeds.

blood meat = dark meat (muscle from just under the skin on each side of a fish that is darker and richer in fat than other flesh. Also called brown muscle, dark muscle, red muscle).

blood parrot cichlid = a hybrid cichlid with various deformities first bred in Taiwan about 1986. Deformities include a beak-shaped mouth that cannot close properly, a deformed gas bladder that affects swimming ability, abnormal spines contributing to their unique shape, and unusually large irises. Usually bright orange in colour, they may also be dyed, shortening their life span. The parents are uncertain but may include the midas cichlid (*Amphilophus citrinellus*) and the redhead cichlid *Vieja synspila*, or the banded cichlid (*Heros severus*) and the red devil (*Amphilophus labiatus*). Ethically questionable, campaigns against their production and sale have been mounted. Also called bloody parrot and blood parrotfish.

blood parrotfish = blood parrot cichlid.

blood pickle = a solution of salt and body fluids formed when immersing fatty fish such as herring in dry salt in an air tight barrel.

blood spots = superficial red blood marks on fish fillets, noticeable on white flesh, removable by washing.

blood water = a liquid comprised mostly of fish blood and water, resulting from processing fish.

bloodworm = 1) the red chironomid midge larvae living in bottom sediments and used by anglers in Europe as bait for small fish and by aquarists as fish food. Some sources carry pathogens and may not be advisable as aquarium food.

bloodworm = 2) sandworm (a marine worm (Polychaeta) used as bait in angling, e.g. for striped bass).

bloodworm scraper = a tool used to collect bloodworms, comprising a long handle and an angled metal blade to which the bloodworms stick when it is scraped through the silt.

bloody boil = furunculosis (a systemic bacterial disease (*Aeromonas salmonicida*) generally of salmonids but also found in some flatfishes such as turbot (*Scophthalmus maximus*)). Usually occurs in young fish following stress and in spring when temperatures rise and is characterised by loss of appetite as the intestine is inflamed).

bloody parrot = blood parrot cichlid.

bloom = a rapid and localised increase in the density of plankton resulting from a nutrient-rich habitat. The nutrients may come from upwelling, mixing or pollution and the bloom can kill fish populations through toxins or oxygen depletion.

Bloss = biomass at the lowest observed stock size.

blotch = an irregular pigment mark, often with poorly defined margins.

blow = to dry fish in the open air without salt.

blow down = a tree that has fallen into the water and so creates a habitat for fishes.

blow line = a light line used in angling that is carried by the wind, only the live or artificial bait touching the water surface. Also called sail as it catches the wind.

blow-fish = fish dried by exposure to the wind.

blow-herring = a herring slightly cured for speedy consumption.

blow-meat = flesh or fish dried by the wind.

blowfish = 1) a person with unjustifiably high self-esteem as evidenced by the assumption of an exaggerated, large, or erect posture.

blowfish = 2) a cipher used in cryptography.

blowfish = 3) fish dried by exposure to the wind.

blown = 1) a spoiled can of fish evident by its swollen ends.

blown = 2) fish oil slightly oxidised by blowing air through it.

blown out = referring to a river after heavy rain, having high water levels and muddy conditions.

blowser = one who assists in dragging the seine nets into shallow water in pilchard fishing (Cornish dialect).

blowsing = pilchard fishing, working in seine boats (Cornish dialect).

blubber = 1) to smear or coat wooden objects or structures with rendered cod livers as a preservative against the salt water (Newfoundland).

blubber = 2) to hurl rotted cod livers or to assault someone by smearing with cod oil (Newfoundland).

blubber barrel = blubber tub.

blubber butt = blubber tub.

blubber cask = blubber tub.

blubber puncheon = blubber tub.

blubber soap = a soap made from the oil and rotted livers of cod (Newfoundland).

blubber tub = a large wooden container in which cod livers are stored or placed for the rendering of the oil (Newfoundland).

blubberlip = an aquarium term for the thickened lips of some cichlids and grunts, apparently an aid in feeding.

blue bones = blue, blue-green or green bones are known from such fishes as *Cottus*, *Belone*, *Zoarces*, *Strongylura*, *Tautoga*, the pigment being closely similar to bilverdin. Skin areas and spinal cord may also have this colouration.

blue disease = a disease of unknown cause evidenced by a blue line on the dorsal side of the body.

blue drop = an area of open sea water in an ice-field.

blue flesh = some fishes have a bluish tinge to the flesh and bones although they are edible, e.g. the labrid *Tautoga onitis*.

blue frontier = the oceans in the sense of an area to be explored.

blue hole = a circular area in a tropical marine habitat where water depth is greater (creating a blue colour) than ringing coral. Attracts a variety of fish species. Also found landlocked in the low porous rock of islands, formed by erosion and enlarged by currents, and fed by tidal water.

blue note = a receipt for fish sold to a merchant, used as credit for goods and provisions to be purchased (Newfoundland).

blue revolution = modern aquaculture.

blue sac disease = a condition of alewife in which the yolk sac takes on a bluish colour. Caused by a lack of oxygen (partial asphyxia) and/or high carbon dioxide concentrations which limit the uptake of oxygen into the bloodstream.

blue slime disease = 1) costiasis (an infection of the skin, fins and gills of aquarium and hatchery fish by the flagellate protozoan *Costia* sp. (or *Ichthyobodo*; and also *Chilodonella*, *Trichodina*). Found in young fish just as they start feeding externally, in colder waters. Stress may be a factor. Fish may show lethargy, appetite loss, flashing, respiratory distress in the form of gill flaring and gasping, fin erosion, and produce abundant mucus, giving a cloudy appearance, hence the names blue slime disease or skin slime disease. The skin and scales may peel away in strips in acute cases).

blue slime disease = 2) a skin condition associated with a lack of biotin (*q.v.*) in the diet.

blue thumb = the aquatic equivalent of green thumb (as in facility in raising plants), a natural ability to raise fish.

blue tinge = irritation of fish skin causing excess production of mucus giving the fish a pale blue colour, especially when viewed from above in the water. Particularly associated with the parasite *Costia*. Can also be brought on by malnutrition, especially a lack of biotin in the diet.

blue water = the open sea; named for the apparent deep blue colour caused by clear and deep water with less suspended matter than inshore waters.

blue wing = dried salted cod which is white naped (*q.v.*) but rather stale and thus shows a bluish tinge to the nape.

blue-cock = a young salmon, coming up from the sea very late in the season, with bluish head and shoulders (English dialect).

blue-head worm = marsh worm (a type of worm used in angling).

blue-water fishing = big game fishing.

bluewashing = false marketing claim that fish being sold or served are sustainable seafood.

BMSY or  $B_{MSY}$  = biomass at MSY (the long-term average biomass value expected if fishing at  $F_{MSY}$  (the fishing mortality rate which, if applied constantly, would result in maximum sustainable yield. Can be estimated from simple biomass-aggregated production models or from age-structured models that include a stock-recruitment relationship)).

board bridle = backstrop (a short wire or chain system between the otter board and bridle on an otter trawl. Also called backboard becket, backstrop, board leg, board strop, door legs, door strop and sling).

board chain = chain bracket (a chain used on an otter board in place of a bracket. Also called angle iron chain, back board chain, chain triangle, towing chain).

board leg = backstrop (a short wire or chain system between the otter board and bridle on an otter trawl. Also called backboard becket, backstrop, board bridle, board strop, door legs, door strop and sling).

board link = backstrop link (a triangular steel link with rounded corners on the back of a trawl's otter board. The backstrop is attached here. Also called door sling ring, shearboard link and VD link).

board strop = backstrop (a short wire or chain system between the otter board and bridle on an otter trawl. Also called backboard becket, backstrop, board bridle, board leg, door legs, door strop and sling).

boarding = 1) taking fish from a trawler to the fish carrier. Also known as trunking and ferrying.

boarding = 2) pulling in fishing lines or nets.

boat = a small vessel used for water travel and work, smaller than a ship; a fishing vessel less than 5 net tons capacity; small enough to be loaded onto a ship.

boat a net = to haul a net into a fishing boat and reset it in the water (Newfoundland).

boat control = positioning a boat while angling so as to maintain it and the fishing rig in the optimum configuration for catching fish.

boat day = fishing effort in terms of number of boats and number of days, e.g. 10 boats for 6 days would be 60 boat-days of effort.

boat fisherman = an inshore fisherman in Newfoundland.

boat fishery = the Newfoundland cod fishery carried out from small craft in inshore waters.

boat harbour = a Newfoundland cove from which small craft carried out the cod fishery.

boat keeper = a man who operates inshore fishing craft (Newfoundland).

boat(s) master = the captain of an inshore fishing craft (Newfoundland).

boat net = a landing net (*q.v.*) with a long handle used from a boat to lift fish from the water when caught by angling.

boat rod = a heavy duty fishing rod used in big game fishing.

boat seine = a net consisting of two wings, a body and a bag, operated from a boat and hauled along the sea floor by two long ropes that help in driving fish towards the net opening, e.g. a Danish seine.

boat share = in a fishery, the percentage of the gross which goes to the vessel owner.

boat's room = an area of foreshore in Newfoundland used for fishing boats and the cure of the catch.

boat teind = a tithe levied on a fishing boat (Scottish dialect). See also fish teind and teind fish.

boathook = a hook on a pole used to grab objects, such as lines, in the water.

bob = 1) bobber.

bob = 2) a bunch of worms used as bait when fishing for eels.

bob = 3) any fish fly other than the tail fly, named for the bobbing motion it makes on the water surface.

bob house = ice shack (a small shelter for ice fishing used as a protection against the weather. Also called ice shanty).

bob net = a long salmon net, suspended from corks, fixed by a stone or anchor at one extremity in the river and to a post or ring on shore. Often fished to effect in eddies, and called bob because the net bobbed or danced in the water movements, or when fish were caught by the gills. In England, the use of this net has been prohibited since 1857.

bob rod = a fishing rod.

bob-fly = in angling, a second fly that bobs on the water surface, indicating the position of the end fly.

bob-net = bob net.

bob-rod = bob rod.

bobber = 1) a plastic, cork or wood device in angling that enables a baited hook to be suspended in the water column and enables fish biting on the hook to be detected by movement of the bobber. Some are even lighted for night fishing. Also called float, q.v. for more details (float in England, bobber in North America).

bobber = 2) a float used to mark the position of a net or other commercial fishing gear.

bobber = 3) a person who helps unload fishing boats.

bobber = 4) a man who stands on a bench by the salesman and receives the bobbing-charge.

bobber = 5) bob (3). Also called babber.

bobbin = 1) a rubber or steel roller on the footrope of a bottom trawl used to protect the net from damage.

bobbin = 2) a flat-topped hat used to balance and carry small loads of fish in Billingsgate Fish Market, London. A rim on each side directs leaking water and fish guts away from the porter's face and onto the ground behind him.

bobbin wire = an assembly of bobbins.

bobbing = a fishing line without a hook but with a bait or bob that a fish will seize and, if pulled in slowly, the fish can be caught, e.g. eels that tangle their teeth in woollen thread, garfish that entangle their teeth in a spider-web used on some islands of Oceania.

bobbing pole = a long, stout rod with line and baited hooks used to take cod in Newfoundland.

bobbing-charge = the payment of one penny by a porter in Billingsgate Fish Market for the privilege of carrying bought parcels of fish for the buyer.

bobtail = the process of severing the tail of a fish from the body, allowing blood to escape through the caudal artery.

bocco = boco.

boco = a good haul of fish (Sussex dialect, from the French beaucoup).

BOD = biological oxygen demand. BOD5 is the amount of dissolved oxygen consumed in five days.

bodabid = two or more fishing boats that pool their catch and divide the sale price equally (Scottish dialect). Also spelled bodabit.

bodabit = bodabid.

bodara = pan-dressed and split cod or sometimes pollock, washed, then dried in the sun without any salt (Japan).

böddie = buddie (a straw creel (*q.v.*) (Scottish dialect). Also spelled büddi, budy, buithy or bödi).

bøddi = buddie (a straw creel (*q.v.*) (Scottish dialect). Also spelled büddi, budy, buithy or böddie).

bodyed waggler = a waggler, *q.v.*, having a buoyant bulb near the bottom of the float that increases the amount of shot needed to set it. This rig exaggerates the float tip movement when a fish takes the bait, allows longer-distance casting and greater stability in windy conditions.

body = 1) the main part of a net or trawl.

body = 2) lint (netting in the main body of a drift or gill net. Also called middle twine, middle yarn, netting, sheet, webbing, yarn).

body cavity = the hollow in the abdomen in which lies the intestines, liver, kidneys, reproductive organs, etc.

body depth = the greatest vertical depth of the body (excluding fins).

body girth = the circumference of the body.

body length = the length of the trunk which is taken as the distance between the posterior end of the head to the base of the caudal fin.

body mount = a prepared fish skin fitted over a fish-shaped form.

body of water = a sea, lake, harbor, river, stream, pond, or other area of water.

body ring = a dermal plate encircling the body, e.g. in Syngnathidae.

body weight daily = a measure of food requirement and/or uptake expressed as a percentage or as a decimal fraction. Abbreviated as BWD.

body-down pole float = an angling float thicker at the bottom used for fishing in still or slow waters and good at showing on-the-drop bites.

body-up pole float = an angling float thicker at the top used in fast water where the float can be held back without riding out of the water.

boette = bait used in fishing, pieces of fish or molluscs, waste, small live fish, eggs, etc. (France).

bog = acidic freshwater wetlands that are poorly drained and characterized by a buildup of peat but are poor in mineral ions.

bog-margined = a water body with wet, spongy margins making access to open water difficult.

boggin = disgusting; smelling like fish (slang).

boggler = a night-line for fish (Derby dialect).

bogwood = wood preserved under the anaerobic conditions of bogs, used as a habitat for fishes, a growing surface for plants and as decoration in aquaria. Leaching of tannins turns the water brown, but also softens hard waters and increases acidity, beneficial in some freshwater aquaria.

Bohr effect = the increased facility with which the blood unloads oxygen when its carbon dioxide tension is increased.

boil = 1) a mass of fish attacking food or bait just below the surface. Also called boiling school.

boil = 2) fish, potatoes and onions boiled in salted water, usually at a picnic.

boil = 3) an upward flow of water in a sandy formation resulting from a rise in a nearby stream; the bubbling up of a spring.

boil = 4) an upwelling causing water surface turbulence.

boil disease = a sporozoan disease evidenced by large boils and causing loss of equilibrium and death, e.g. in large *Barbus* and salmonids.

boil house = a building where fish oil is rendered (Scottish dialect).

boilie = a small, rounded, boiled artificial bait used by anglers in Europe. Usually egg is added to a paste bait giving it a hard skin that deters small fish. May be coloured and flavoured (e.g. spicy, fishmeal and sweet) and composed according to a variety of recipes (the best being secret of course). Effective against fish that have been caught many times, a function of the number of anglers, limited waters and available fish in Europe. A whole complex of recipes and equipment has grown up around this type of bait (see below).

boilie baiting needle = a thin needle or crochet-like hook used for mounting a boilie on a hair-rig, q.v.

boilie catapult = a powerful catapult with a rigid cup to hold boilies to be projected into a swim to attract fish. Often with a wrist support because of its powerful elastic.

boilie dip = a solution in which boilies are dipped just before fishing.

boilie drill = a small, hand-held tool with a fine drill bit for drilling holes in boilies and other particle baits for easy hair-rigging.

boilie hair stop = a small, angled piece of plastic with bulbs at each end. Boilies are placed on a hair rig where they work best and the stop holds them on. A piece of grass can do the same thing.

boilie mix = a commercially available mix of dried ingredients used to make boilies.

boilie needle = a needle with one side of the eye removed thus forming a hook; this is used to attach bait to a hair rig by placing the bait or boilie onto the needle, hook the hair rig loop onto the needle and pull the bait down onto the hair.

boilie punch = a small tool for making a large hole in a boilie to insert rig foam thus making a buoyant bait.

boilie rocket = bait dropper for boilies (or other baits). Used on a spare fishing rod and cast to the desired spot.

boilie rolling table = a table with grooves lined up next to each other. The boilie mix is rolled into long sausages and placed across the grooves, a lid is pushed down on the sausage so it squeezes down into the grooves, and the lid is pushed and pulled so the boilie mix is rolled into even balls. These balls can be air-dried, boiled or microwaved.

boilie stop = boilie hair stop.

boilie throwing stick = a foot long stick with a curved channel at the top where boilies are placed. An over the shoulder swing with the channel forward throws boilies into the swim.

boiling school = boil (1).

bokkem = dried, salted horse mackerel (*Trachurus trachurus*) (South Africa).

bolch line = the rope to which a trawl net is bent before being attached to the ground rope.

Bolognese method = use of a very long, telescopic or take-apart rod allowing the casting of a long, fixed float rig and its control at long range in deep flowing water.

Bolognese rod = the fishing rod used for the Bolognese method, 15-20 feet or 4.6-6.1 m long.

bolt rig = in angling, a ledger rig where the fish hooks itself. The fish takes the bait and bolts when the hook pricks the mouth. The hook is pulled home by a line clip and heavy bite indicators such as monkey climbers or a heavy lead, or both.

bolta stone = cappie (a heavy stone used as a sinker to a fishing line (Shetland Isles dialect). See also caapie and cappie-stone).

bomb = 1) a heavy lure used to catch wahoo (*Acanthocybium solandri*).

bomb = 2) a heavily weighted nymph fished in fast, deep water and often used to sink an unweighted fly, the fish taking the latter.

bomb rod = a light fishing rod, 2.7-3.4 m long, used for legering with a light line, quiver tip, a small hook and a small Arlesey bomb. This type of rig is used in match fishing in Europe.

bombarda = a weighted float used in rod and line fishing. The main line passes through it, and when cast out, the bombarda sinks slowly as it is retrieved. Depending on the weight of the bombarda and the retrieval speed, the level fished in the water can vary from the surface to deep water.

Bombay Duck = not a duck but a strong-tasting and stinky delicacy of the western coast of India, sun-dried and salted *Harpodon nehereus* (Harpodontidae). It keeps a long time if kept dry and can be crumbled over stews and curries. The name may come from Bombay Dak (the Bombay Mail train) that would smell of this odiferous fish.

bombing = a home-made bomb made from an empty glass bottle filled with fertiliser and kerosene used to stun fish on coral reefs for capture and sale in the aquarium trade.

bonae species = Latin for good species, i.e. valid species (plural). Seldom used now but does occur occasionally in papers published as recently as 2009 (and this was written in late 2008, a consequence of online publication).

bone = 1) the hard connective tissue consisting of cells (osteoblasts, osteocytes) in a mixture of collagen fibres and hardened by calcium and phosphate salts (calcium hydroxyapatite), serving to support the body. The cells are lost eventually leaving cavities and the bone is termed cellular, typical of Dipnoi, Crossopterygii, Chondrostei, primitive Teleostei, e.g. Cyprinidae, Siluridae, Salmonidae, Anguillidae, and some advanced Teleostei, e.g. *Perca*, *Gadus*. Another form of bone is termed osteoid and lacks the ramifications seen in cellular bone. After the osteocytes disintegrate, the spaces they leave are filled with matrix and the bone is known as acellular, e.g. in *Cyclopterus*, *Mola*. Bone is strong and rigid in contrast to cartilage. Older works on fish anatomy may have bones listed in Latin; many of these are grouped herein under the Latin for bone "os". Plural forms are given there for those unfamiliar with Latin. Note that some bone and skeletal names in English are the same in English and Latin, e.g. branchiocranium, and the majority of English names are derived from the Latin name, merely having different word endings. Either English or Latin forms are used in osteology.

bone = 2) to remove bones from a fish.

bone finger = an inflammation of the fingers and hands caused by handling cod in cold salty water (Newfoundland).

bone hooker = a small iron hook used to remove nape bones from dried salted cod.

bone meal = ground bones of animals and fish, high in calcium and phosphorus, and used in fish feeds and as a plant fertiliser. May pollute waters because of the high phosphorus content and so not used as extensively as in the past.

bone separator = a mechanical device for separating fish flesh from skin and bone. Flesh is squeezed through perforations on a drum and removed on the inside, leaving skin and bones on the outside.

boned = 1) fish with the main bones removed; some minor bones remain. Also called boneless fish or deboned fish.

boned = 2) having a particular kind of bone.

boneless = a term referring to commercial preparations of fish that have had all or most of their bones removed, e.g. boneless salt cod fillet, boneless smoked herring, etc.

boneless cod = a superior grade of salted cod from which bones and skin have been removed. See also semi-boneless cod (where some small bones are left).

boneless fillet = a fillet with the pin bones (*q.v.*) removed.

boneless fish = fish with all bones removed. May mean having a low bone content, or major bones removed; the flesh of a fish separated from skin and bones by mechanical means (see bone separator). Also called minced fish, mechanically recovered fish flesh, recovered fish, recovered fish flesh, and deboned fish.

boneless fish meat = boneless fish.

boneless kipper = herring that have been headed, boned, brined, cold smoked and split down the belly after cutting away a thin strip of belly skin. May be sold fresh, frozen or canned.

bonk = angling slang for killing a fish.

bony fishes = a general term in popular use for most fishes other than sharks and their relatives, the lampreys and the hagfishes, and certain "lower" fishes. Formerly the class Osteichthyes.

bony labyrinth = the skeleton of the membranous labyrinth, composed of otic bones anteriorly, occipital bones posteriorly and dermal roof bones dorsally.

bony stay = suborbital stay (the bone beneath the eye (suborbital bone) extending across the cheek to the preopercle, or almost to the preopercle. Found in Scorpaeniformes).

bony-ridge scale = the cycloid and ctenoid scales of fishes.

bonyfish = the adjective for bony fish, as in bonyfish species.

boobootype = a joke holotype in nomenclature, one that should not have been described such as a species previously described by the author and not recognised as the same as the boobootype.

booby = a brightly-coloured lure with polystyrene eyes, pulled quickly through the water. See also blob.

book = a grade of isinglass (the glutinous or gelatin-like fluid prepared from the collagen of the outer layer of gas bladders of sturgeons or other fishes. Used in clarifying wines and beers, for jams and jellies, in printing inks and as an adhesive cement).

book name = some common names of rare or deepsea species are artificial "book names" as these species are never seen by the general public. They are coined simply to provide a consistent format in books where common names are used or to provide a means of communication with people unfamiliar or uncomfortable with Latin names.

bool = of fish, to play on the surface of the water (Shetland Islands dialect).

booliver = a large and fat-bellied fish (Scottish dialect).

boomerang = butterfly (an L-shaped steel plate shackled between the dan leno spindle and legs. Also called arm, banana, dan leno arm, dan leno bracket, dan leno spreader, devil's elbow, spreader bar).

boondogging = drifting a boat at or about the same speed as the current so one cast runs the entire length of the run.

boondoggling = boondogging.

boot = an old salmon past the edible stage, spawned out (in British Columbia).

bore = 1) a rapid tidal rise in a river that forms an advancing wall of water. Also called eagre.

bore = 2) a compiler of ichthyological dictionaries.

boreal = of the north temperate region, between the arctic and tropical regions. Opposite of antiboreal or austral.

bosom = the centre part of a trawl lying between the two wings; the bag. Also spelled busom or busum.

bosom hoffle = the highest stake in a row of hoffle stakes (*q.v.*).

bosom piece = 1) a narrow section of strong netting across the front edge of the belly next to the foot line of a trawl.

bosom piece = 2) similar netting behind the centre of the ground rope of a Danish seine.

bosom tickler chain = a chain attached at each end across the bosom section of the ground rope of a trawl; it functions to stir up sediment and thus scare benthic fish upward and into the net.

Boston cut = a fish fillet that has most of the nape removed leaving some pin bones which break down in cooking.

botargo = a relish made of roe of mullet or tunny, lightly salted, pressed and sun-dried. It can be bought in sausage form and thinly sliced or grated (Italy). See also bottarga.

botcher = a second-year salmon (English dialect).

botches disease = a highly contagious disease evidenced by blood-coloured blotches on the fish skin.

bottarga = a relish made of roe of mullet or tunny, lightly salted, pressed and sun-dried. It can be bought in sausage form and thinly sliced or grated (Italy). See also botargo.

bottle forceps = long forceps designed for extracting specimens from jars.

bottleneck = a sharp reduction of a breeding population's size to a few individuals with important genetic consequences depending on both its magnitude and its duration. An altered gene pool can result from genetic drift.

bottom = 1) the surface underlying the water column, the bed.

bottom = 2) the innermost part of bay or harbor; may refer to the land surrounding the bay (Newfoundland).

bottom = 3) the section of netting forming the floor of a cod trap.

bottom = 4) the lower part of a trawl.

bottom boundary layer = the lower part of the water flow that is frictionally retarded by proximity to the bed of a river.

bottom configuration = the shape of the bottom of a body of water.

bottom drift = gill nets allowed to drift close to the bottom.

bottom feeding = fish eating organisms found in or at the bottom of a water body.

bottom fish = 1) groundfish (fish that live on or near the bottom, usually those sought commercially).

bottom fish = 2) to fish with a weighted line for fish that feed close to the bottom.

bottom fishing = 1) catching bottom fish.

bottom fishing = 2) buying stocks when prices are depressed during an economic downturn.

bottom ice = ice formed on a river, lake or shallow sea bed.

bottom land = lowland along a river, subject to flooding.

bottom mop = a tightly tied mass of synthetic yarn in various configurations used as a spawning medium in aquaria for fish that normally lay eggs on vegetation. The bottom mop is used for species that spawn at or near the bottom.

bottom otter trawl = an otter trawl towed on the sea floor by one boat; the net is kept open by otter boards that plane through the water and are heavy enough to maintain contact with the sea floor. The otter boards have a steel bottom to protect them against the rough sea bed.

bottom pair trawl = a trawl towed by two boats at the same time, the distance between the boats ensuring the horizontal opening of the net.

bottom roller = one of the steel balls or rubber disks, about 41 to 61 cm in diameter, mounted on the bottom of a trawl.

bottom set = any net set close to or on the bottom of a body of water.

bottom trawl = a net shaped like a bag dragged along the sea floor. The lower edge of the net has a thick ground rope or bobbins to prevent net damage and is heavily ballasted. Some trawls are low-opening to capture demersal species, others are high opening to capture semi-demersal or pelagic species.

bottom trawler = a ship that deploys a bottom trawl.

bottom water = the water mass at the deepest part of the water column.

bottom wing = the lower wing of a trawl to which is fastened the ground rope.

bottom-end float = any float in angling that is attached to the line at the base only. The line can be fed through a rubber ring around the float or held in place by locking shot when the line is fed through the eye at the float base. Leaves the float tip free of line and helps sink line near the float so that float action is more easily detected.

bottom-set longline = a longline set on or near the sea floor.

bottom-set gillnet = a net anchored on or close to the bottom by anchors and ballast.

bottom-set pot = a pot or basket made of wood or osier and used to catch eels (or crabs and lobsters). Also called ground basket.

bottom-side chafer = netting, canvas or other material on the underside of a trawl to protect it from abrasion,

bottom-walking weight = in angling, a banana-shaped weight on one end of a v-shaped wire frame designed to bump along the bottom without snagging.

bottomfish = bottom fish.

botulism = an often fatal form of food poisoning from a neurotoxin produced by *Clostridium botulinum*. Occasionally carried by fish which are susceptible in the raw, fermented, canned and smoked products.

bough = to cover a flake (*q.v.*) with conifer branches to allow air circulation for drying of the fish (Newfoundland).

bought = a coil of fishing lines or a fishing line about fifty fathoms long (Shetland Islands dialect).

bouillabaisse = a French fish soup from Marseille based on several species of fish with shellfish, vegetables, white wine, olive oil, saffron, herbs and seasonings. Usually the more people who the soup is made for, the better the soup and the more fish species used. Species include scorpionfish, sea robins, monkfish, John Dories and congers.

boulder = a substrate particle larger than 25 cm (or 60.4 cm, sources differ), usually rounded. The largest body transported by a stream or moved by surf in the ocean, usually taken as heavier than 50 pounds and larger than 8 inches.

boulter = a long and stout fishing line with many hooks attached. May be up to 500 feet with 60 hooks baited with pilchards or mackerel. Also called spiller.

bounce = bringing a hooked fish into a boat without using a gaff or net.

bouncing bomb = fishing in running water with a leger rig weighted such that it is not quite heavy enough to hold bottom. Feeding out a bow in the line leading to the leger will cause the bait to bounce slowly downriver.

boundary current = a large-scale mass of water in the upper ocean that separates water masses. Driven by a combination of wind, temperature and coriolis effects.

boundary fishery = a fishery that is carried out at the boundary of some oceanographic feature such as a change in temperature or edge of a current.

boundary sign = a sign indicating areas closed to fishing, often shaped and coloured in a standard fashion to indicate the particular regulations.

boundary water = a river or lake that is part of the boundary between two or more countries or provinces that have rights to the water.

bourdeto = a fish broth from Corfu, cooked in tomato sauce with onion, garlic and red spicy pepper.

bourn = a stream, brook or rivulet in southern England (Saxon).

bourne = bourn.

bow = 1) the pointy end of a ship.

bow = 2) excess fishing line in the shape of a curve between the rod tip and the lure.

bow = 3) a willow twig bent in the form of a crescent to which a fishing net is fastened.

bow-net = a wicker-work, cylindrical fish trap with a single narrow entrance. More often used for crayfish.

bowater = a man who poaches salmon by night with a light (Roxburgh dialect in Scotland).

bower = a structure used for mating, but not rearing of eggs and young. Males of certain species, e.g. *Aulonocranus dewindti*, build mounds with a crater on top to attract a mate, cf. nest.

bowfer = a high-prowed, shallow-bottomed coble boat used in Scotland to collect salmon from inshore nets.

bowfishing = fishing with a bow and arrow; in North America often for carp that are competing with more highly prized species such as bass. The arrow is tied to the end of a line and the reel is mounted on the bow.

bowl = 1) a rounded glass container for keeping live goldfish.

bowl = 2) a float or buoy on a fishing net (Norfolk dialect).

Bowman's capsule = the cuplike proximal end of a kidney tubule surrounding a glomerulus.

box = 1) a box for storing and transporting fish, usually 15-50 kg.

box = 2) an area in the sea set aside to protect fishes, e.g. a plaice box to protect juvenile plaice.

box gage = a tidal gage operated by a float in a long vertical box. The tide enters through a hole in the bottom of the box and a graduated rod rises and falls with the tide.

box net = 1) a trap net set under ice.

box net = 2) a trawl comprising top, bottom and two side pieces; the size of the latter can be changed so that the net is flat, semi-balloon or balloon.

box net = 3) a rectangular frame of netting having three sides and moored with stakes and anchors.

box trap = 1) a box with an open entry door through which a fish enters, triggering a release closing the door and trapping the fish. Some box traps have simple funnel entrances rather than a trigger release.

box trap = 2) box net (3), a form of cod trap.

boxed stowage = fish mixed with ice in boxes for storage at sea.

boxing = 1) boxed stowage on board a fishing vessel in ice for high quality fish.

boxing = 2) packing chilled fish in polystyrene boxes for air or overland distribution.

$B_{pa}$  = the precautionary spawning stock biomass, a higher level than  $B_{lim}$  (q.v.) to allow for uncertainties in assessment. See also precautionary approach,  $B_{lim}$ ,  $F_{pa}$  and  $F_{lim}$ .

Br = 1) photophores along the lower jaw of Myctophidae; formerly called maculae branchiostegae by some authors.

Br = 2) abbreviation for branchiostegal rays.

braad = a sharp pull on a fishing line to hook the fish, or to make such a pull (Caithness dialect). Also spelled brad and brawd.

brace line = lines used for lacing the adjoining shots (single net pieces) in a fleet of gill nets.

Brachet's cleft = the visible division between the epiblast and hypoblast in the gastrula.

brachial ossicle = actinost (one of a series of endochondral bones in the pectoral and pelvic girdle on which the fin rays insert. Most teleosts lack or have greatly reduced pelvic actinosts. Teleosts have one row of actinosts between the fin rays and supporting skeleton (coracoid and scapula for the pectoral, basipterygia for the pelvic) while other fishes may have more rows, referred to as radials).

brachy- (prefix) = short.

brack = salt or brackish water.

bracket = one, or a pair of, triangular shaped steel frames hinged to the front face of otter boards, to which the warp is attached on a trawl.

bracketed key = a dichotomous key in which contrasting parts of a couplet are numbered and presented together, without intervening couplets (the brackets are omitted). Used in some fish keys.

brackish = fresh water with some salt content, as in estuaries, in the range 0.5-17.0 parts per thousand.

brad = braad.

braddle = broddle.

brado = block fillet of prime herring, lightly brine-salted and smoked until reddish brown (Netherlands).

bradydont = having slow tooth replacement.

brae = an artificial bank of gravel and stone built across a river as a salmon trap (Scottish dialect).

braid = 1) a synthetic woven material used for fishing lines. Softer and more supple than ordinary monofilament lines, more abrasion resistant and not as stretchy.

braid = 2) to make or mend fishing nets with a mesh and needle.

braided lie knot = a knot used in angling for attaching a hook to braided line. A double loop is run through the hook eye and then eight times around the main line and then through the loop next to the eye. Various websites have animated steps showing how to tie this knot.

braided stream = a complex tangle of converging and diverging stream channels (anabranches) separated by sand bars or islands. Characteristic of flood plains where the amount of debris is large in relation to the discharge.

braiding needle = specialised needles used for repairing fishing nets being blunt, broad, flat and with a large eye having a central spike.

brail (noun) = 1) a form of dip net used to lift fish out of a purse seine or other net on board ship. Also called brailer.

brail (verb) = 2) to use a brail.

brail = 3) a stick attached to the outer end of the wing of a trawl or haul seine to keep it spread.

brail = 4) to throw large quantities of chum (*q.v.*) overboard.

brail = 5) small ropes fastened to the edges of fish nets to truss them up.

brail = 6) to play or splash about on the water surface (Scottish dialect).

brail net = brail (1).

brailer = brail (1).

brailer bag = a very large bag used to lift Alaskan salmon from the fishing boat to the dock.

brailing = 1) transferring of fish in bulk from a net to a vessel or from a vessel to a processing facility.

brailing = 2) the bringing of the lead line of a purse seine to the water surface.

brain = the centre of the nervous system; the complicated enlarged anterior end of the spinal cord which directs the activities of the body and which lies in the cranium. The brain develops by dividing into three regions: the prosencephalon (forebrain), the mesencephalon (midbrain), and the rhombencephalon (hindbrain). The adult brain is achieved by division of the forebrain and hindbrain. The prosencephalon divides into the telencephalon (anterior) and diencephalon. The rhombencephalon divides into the metencephalon (anterior) and the myelencephalon. The mesencephalon remains undivided. Details of the brain structure of a fish (*Danio rerio*) may be found in Wullmann *et al.* (1996).

brain food = traditionally, eating fish is said to make one smarter. Scientific studies variously show some, or no, support for this. Intake of fish has now to be balanced against pollutant load, particularly mercury.

braincase = neurocranium (the portion of the skull surrounding the brain, including the elements that surround the olfactory, optic, orbital or sphenotic, and otic or auditory capsules and the anterior end of the notochord (endocranum) and the series of overlying dermal bones (dermocranum)).

bran = used in Europe to store maggots in for fish bait and as a bulking item in groundbaits.

branch = a small fast-flowing stream or tributary in the southern U.S.A.

branch line = a thin and strong line by which a hook is attached to the main or back line of a troll or long line.

branch water = pure natural water from a stream, usually mixed with whiskey (southern U.S.A.).

branched ray = a soft or segmented ray which divides distally into two or more parts.

branchia (plural branchiæ) = gill.

branchiæ = plural of branchia.

branchial = relating to the gills.

branchial arch = gill arch (the endochondral skeletal support of the gill which bears the gill filaments and the gill rakers. Consists of pharyngobranchials, epibranchials, ceratobranchials and hypobranchials. Usually 4 in teleosts, can be as many as 16 in some Cyclostomata).

branchial bar = one of the vascularized cartilaginous bars serving as gills in Amphiox. Also called pharyngeal bars.

branchial basket = the network-like cartilaginous skeleton of the gill region of Petromyzontiformes and Holocephali.

branchial chamber = the cavities in which lie the gills of Cyclostomata.

branchial cleft = one of the internal slits between adjacent arches which permit water to flow from the buccal cavity to the branchial cavity in Teleostomi or to the exterior in Cyclostomata and Elasmobranchii.

branchial groove = the horizontal groove in which gill openings are found in the larval ammocoetes of lampreys (Petromyzontidae).

branchial opening = the opening from the gill area to the exterior, the gill opening or slit.

branchial ray = the cartilaginous rod projecting out from the gill arch into the interbranchial septum which it supports and from the hyoid arch into the first hemibranch. Homologous with branchiostegal. Found in Elasmobranchii and Acanthodii.

branchial region = the area where the branchial arches and gills develop.

branchial sac = gill pouch (the sac containing the gills and communicating with the mouth cavity and with the exterior in Myxini and Petromyzontiformes). Also called ear sac and probably meant to be any pouch or sac surrounding the gills in fishes generally.

branchiate = having gills.

branchictenia = plural of branchictenium.

branchictenium (plural branchictenia) = gill raker or branchiospina.

branchihyal = any small bone at the base of the gill arches (term no longer used).

branchiocrania = plural of branchiocranium.

branchiocranium (plural branchiocrania) = that portion of the skull related to the gills, including the mandibular region, the hyal region (hyoid arch and branchiostegal series), and the branchial arches including their attached dermal plates, or the branchial skeleton proper.

branchiomycosis = a disease caused by the fungi *Branchiomyces sanguinis* and *B. demigrans* found particularly in carp and eels. Respiratory distress is caused by gill necrosis as blood vessels thrombose. Gills become discoloured in patches and rot. Occurs in ponds with high

temperatures, excess organic matter and high ammonia levels. Also called gill rot and European gill rot.

branchiopercle = a fourth bone of the opercular series in *Amia*, partially covered by the subopercle and interopercle, but regarded as the most dorsal branchiostegal ray by authors.

branchiospina (plural branchiospinæ) = gill raker (one of a series of variously shaped bony or cartilaginous projections on the inner side of the branchial arch. The rakers have epithelial denticles and both their gross and fine structure serves to retain food particles in the mouth. The gill raker count normally includes all rakers, even the rudiments, and is made on the front half of the first arch. Upper and lower gill raker counts may be presented as the upper and the lower (including the central raker), e.g. 9 + 17; or as upper rakers, central raker, and lower rakers, e.g. 9 + 1 + 16. The most anterior and posterior rakers are often small and delicate, easily torn or lost if the arch is removed. Plankton feeders have numerous, crowded, elongate and fine rakers while predators have few, separated, short and stubby rakers).

branchiospinæ = plural of branchiospina.

branchiospine = branchiospina.

branchiostegal = one of the dermal bony (or cartilaginous) struts inserting on the epihyal and/or ceratohyal and sometimes the interhyal and hypohyal, and supporting the branchiostegal membranes. Of various forms from narrow, to plate-like to hooked, with numbers varying according to phylogeny, up to 50 in Actinopterygii to none in Crossopterygii. Less preferably called branchiostegal rays because of confusion with the fin rays.

branchiostegal membrane = the membrane below the operculum, often attached to the isthmus, supported by branchiostegals and helping to enclose the gill chamber ventrolaterally. Branchiostegal membranes are separate when the membranes of the two sides are separate from one another and the isthmus; they are united and free from the isthmus when the membranes of the two sides are joined to one another and have a narrow or wide margin behind nattached to the isthmus; and are joined to the isthmus when they fuse to the isthmus without a free margin. Often inappropriately called the gill membrane.

branchiostegal photophores = a row of photophores along each mandible in Myctophidae. Abbreviated Br.

branchiostegal ray = branchiostegal is preferred.

branchoses = degenerative condition of the gills.

branco cure = salt cod that has been made whiter by stacking in piles (water-hosed) for several days after washing. Final salt content is about 20% (Portugal).

brandade = salted cod, cooked and then mashed with garlic and olive oil into a paste. Lemon juice, parsley and pepper are usually added (France).

branded herring = pickled herring packed in barrels that carried a Government brand of quality (Scotland and northeast England). No longer practiced.

branding = a means of marking fish by mutilation for subsequent recapture and identification in growth and migration studies.

brandling = 1) a common reddish-brown earthworm (*Eisenia foetida*) often used as fish bait.

brandling = 2) a young salmon, or occasionally a trout (English dialect).

brandy is Latin for fish = a saying arising from the thirst and the uneasy feeling after eating richer species of fish having led to the use of spirits with this kind of food (popular saying, nineteenth century London).

brash = rubbish brought up in a trawl.

brash ice = sea or river ice fragments less than 6 feet in diameter.

brat = hatchery-raised steelhead salmon.

Brat-bückling = small herring, lightly cured in brine, and cold smoked. Fried before eating (Germany).

brat-rollmops = rolled and fried herring or herring fillets, without the tail and bones, wrapped with pickles, slices of onions etc., and fastened together with small sticks or cloves. Packed with vinegar-acidified brine, semi-preserved or pasteurised (Germany).

Bratfischwaren = fish fried, grilled or heated in edible oil or fat, packed in acidified brine, with spices or other ingredients and also with sauces. Often prepared herring (Germany).

brathering = fried, gutted herring in vinegar brine.

brawd = braad.

brawl = to flow noisily.

Brazil fish = dried and salted cod marketed in the northern provinces of Brazil from the fishery grounds off Newfoundland.

Brazilian invisible fish = an advertising stunt where a bowl of water was placed in the window of a store with a sign saying it contained an invisible fish. The idea was to attract customers. Sometimes a concealed fan produced ripples on the water. Apparently crowds gathered claiming they could see the fish.

breach = 1) launching completely or partly out of the water with a re-entry splash. Tends to be used for larger fishes, and more familiarly with whales.

breach = 2) a swirl, ruffle or break in the water caused by a fish.

bread crust = a favourite bait in Europe either legered in winter or floated in summer. It may be coloured and/or flavoured. Used for various cyprinid species like carp, chub, roach and rudd in England.

bread paste = stale bread kneaded into a paste and used as bait for fish in Europe. May be coloured and flavoured.

bread punch = a device that cuts out circular pieces of bread for use as bait in Europe. There are different punches for different hook sizes.

breadcrumbs = used for, or as a base, for groundbait, *q.v.*

breaded fish = sticks and portions of fish with a non-leavened mixture of cereal products and flavourings, sold raw, frozen or partially cooked.

breadth of river = 1) the distance across a river at any given time.

breadth of river = 2) the width across a river at the near bankfull (*q.v.*) stage.

break = 1) to emerge above the water surface; said of fish when spawning in shallows or feeding at the surface.

break = 2) break line.

break line = a point in a water body where there is a sudden change, e.g. in depth, in vegetation cover, in bottom type, current caused by a boulder.

break the beam = to add more fish to a scale to make up for accuracy errors of the scale and for loss in weight during shipment (Newfoundland).

break the price = to determine the price paid for fish during a given season (Newfoundland).

breaker = a wave so steep that its crest falls forward, moving faster than the main wave body.

breaker line = any piece of line on trolling gear near the hook that will break more easily than the main line under stress.

breaker zone = the area where waves break on a shore or reef.

breakfast fish = small capelin (*Mallotus villosus*) for household consumption (Newfoundland).

breaking force = breaking strain.

breaking load = breaking strain.

breaking strain = the maximum strength of a fishing line measured in pounds or kilogrammes as given by the manufacturer, the point at which the fishing line breaks.

breaking strength = breaking strain.

breakoff = when a large fish breaks the line.

breakup = the movement or disintegration of ice in spring.

breakwater = a large structure built out from the land into the sea, protecting a harbour or beach from large waves. Also providing habitat for fishes.

bream pit = pits or depressions about 10 cm across, found on mud bottoms where bream (*Abramis brama*, Cyprinidae) have been feeding using the sucking power of the tube-like extended mouth.

bream section = bream zone.

bream zone = a European river classification system based on species, in this case the cyprinid *Abramis brama*, as characteristic; a sludgy bottom of silt and sand with much macrophyte growth.

breast = the anterior ventral surface under the head.

breast band = a stripe across the breast.

breast line = a wire rope running along the forward edges of the side panels of a net or along the forward edge of the side rope in a rope trawl.

breast mark = a land feature lined up from the sea and used to mark a fishing ground.

breast spot = a small mark on the breast.

breathing valve = oral valve (the flap attached just inside the jaws which stop water escaping from the mouth during exhalation, helping to maintain a unidirectional flow. Usually a valve is found just inside the ring of teeth in the jaw. Also called a buccal valve).

breech = cod or fish roe generally where the ovarian membrane is unbroken, i.e. (Newfoundland; and Northumberland and Yorkshire dialects).

breeder = brood fish or mature fish.

breeding age = the age at which fish reach sexual maturity and are ready to spawn.

breeding bottom = part of the bottom suitable for fish reproduction. Also called spawning bottom.

breeding colour = the pigmentation that develops during spawning. Also called spawning colour.

breeding cycle = the period between hatching and first spawning.

breeding efficiency = effectiveness of fecundation or egg production, usually expressed as a percentage.

breeding ground = the area where reproduction occurs. Also called spawning ground.

breeding hapa = hapa (a small net enclosure in shallow ponds used for deposition of eggs or to raise larval and juvenile fish before release into the general pond environment, e.g. for Indian carps).

breeding nursery = 1) an area favoured for birth or egg deposition where young can grow. Also called nursery.

breeding nursery = 2) an establishment for raising and selecting early development stages of fish. Also called nursery.

breeding place = the exact locality where fish spawn. Also called spawning place.

breeding pond = a pond for holding sexually mature fish in a hatchery setting for use as broodstock. Also called spawning pond.

breeding season = that period of a year in which fish are sexually active. Also called spawning season.

breeding spot = special, spongy vascular areas on the body of some male Syngnathidae, e.g. *Nerophis lumbriciformis*, in which the female deposits the eggs.

breeding stock = fish reared and stocked for breeding purposes.

breeding tank = an aquarium set up for breeding fish, free of predators and disease, and with all the necessary conditions in water quality and physical structures for the species being bred.

breeding trap = a device to prevent the mother and other fishes from eating the newly-born fry in an aquarium. A pregnant livebearer can be placed in a special container within the aquarium, the container confining the female but allowing the fry to swim out through small holes. This type of trap only works where there are no other fishes in the aquarium. An alternative trap allows the fry to enter and seek refuge from the mother and other fishes in a community tank.

breeding tubercle = usually small, raised, epidermal structures on regions of the head, body, or fin rays where two individuals come in contact. May consist of aggregations of non-keratinized epidermal cells, the same with a light, superficial keratinized cuticle, or with substantial number of fully keratinized cells that are organized to form a discrete, usually conical cap. Breeding tubercles may function to maintain body contact between the sexes during spawning; in the defence of nests and territories; in the stimulation of females in courtship; and in some forms perhaps in sex and species recognition. Also called nuptial tubercles. Found in 15 families of 4 orders; Salmoniformes, Gonorynchiformes, Cypriniformes, and Perciformes (Wiley and Collette, 1970).

breezer = angling term for a fish traveling rapidly just under the water surface, often not biting.

brevetoxin = a neurotoxin produced by the dinoflagellate *Karenia brevis* which itself forms red tides (q.v.). Causes fish kills and illness in humans who ingest filter-feeding shellfish.

brevotype = an unofficial term in nomenclature where a type is valid but is based on only the minimal requirements of the Code of Zoological Nomenclature.

brewis = fish and brewis (salt cod and hard bread (or hardtack) soaked in water overnight and then fried and garnished with salt pork and molasses in Newfoundland. Brewis is Middle English for bread soaked in drippings).

brews(e) = brewis.

Bridge's ossicle = one of four ossicles (*a*, *b*, *c* and *d*) on the posterior part of Meckel's cartilage. They may represent the large bone in palaeoniscids. Their homology is *a* = retroarticular, *b* and *c* = articular, and *d* = coronomeckelian.

bridger = the small cord or twisted hair to which a fishing hook or a cast of flies is attached.

Bridgestone cage = a pen or sea cage having a flexible collar or float used in exposed environments.

bridle = the rope or wire between the otter board and net in a trawl. May be single, twin or three bridle rigs. The towing bridle refers particularly to the wire between the net and ground wire.

brig = 1) a square-rigged ship with two masts.

brig = 2) bridger.

brigger = bridger.

brigantine = a two-masted ship with the foremast square-rigged and the mainmast fore- and aft-rigged.

brindled = a pattern of dark or mottled gray flecks or streaks.

brine = 1) a nearly saturated solution of salt in water. 100° is saturated brine, 358 g of salt added to one litre of water at 16°C. An 80° brine is used in smoking.

brine = 2) sea water.

brine cured = fish treated with salt in a water-tight container so that they cure in the pickle that is formed. Also called brine cured, brine salted, tank salted, wet cured, wet salted.

brine gauge = salinometer (a hydrometer used to measure the strength of sodium chloride solutions. Used in commercial preparation of fish. Also called brinometer).

brine liquor = pickle, a mixture of brine and fish body fluids extracted by immersion in the brine.

brine mechanically = brining fish with mechanical conveyers and/or pumps and controls.

brine pack = packing fish in barrels of brine.

brine packed fish = pickle cured fish (fish treated with salt in a watertight container such that they are cured in the resulting pickle drawn out from the flesh by the salt).

brine pickle = pickle, a mixture of brine and fish body fluids extracted by immersion in the brine.

brine shrimp = *Artemia* nauplii are used as food for fry in aquaria and, to a limited extent, adult brine shrimp may be fed to larger fish. They are not very nutritious and should not be used as the sole food. The nauplii are hatched from purchased cysts in warm, aerated, saline water and must be rinsed to remove salt before feeding to fry. Also known as "Sea Monkeys" and sold as such in comics.

brine storage = storing fish in brine until required for further processing or sale.

brined fish = fish immersed in brine as a treatment before further processing.

briner = a person who immerses fish in brine during brining.

brining = immersion of fish in brine before smoking, drying or canning for reasons of flavouring. Dye may be added before smoking.

brink = the gill of a fish (Cornish dialect).

brinometer = brine gauge.

Brisoletten = Fischfrikadellen (cod, coalfish or other white fish made into rissoles by mixing with binding materials and spices, then roasted, fried or hot-smoked, after cooling. Also packed in cans or glass jars usually with vinegar and spices (Germany). Marketed as semi-preserves or canned).

bristle = a stiff hair-like structure.

bristle-tipped float pole = a very sensitive pole float, q.v., with a fine plastic bristle tip.

brit = 1) the young of herring and like fishes. Also spelled britt.

brit = 2) a small sprat-like fish which heralds the approach of a shoal of herrings.

Brit = 3) Brian W. Coad.

britch = fish scored deeply with a knife to facilitate the process of boiling.

britches = breech.

britchet(s) = breech.

britchin'(s) = breech.

British Columbian trawl = a midwater trawl set from the stern. It has curved doors (q.v.) at the end of wire side pennants (or lines) which allows for a wider opening of the net when fishing. The mouth of the net is square and the net has four equally tapering sides. There is no cod end but a section of the net can be opened to empty the catch. The headline has aluminium planing

floats, which cause the net to arch upwards, and an iron depressor at each lower corner of the net to pull downwards. Used to catch herring.

British gold = the cod (*Gadus morhua*), said by William Pitt, 1st Earl of Chatham, in reference to giving fishing rights at Newfoundland to the French when he criticised this part of the Treaty of Paris (1763) in Parliament.

britt = brit.

broad flake = a platform raised on poles and covered with boughs on which large split cod (or flakes) are laid to dry in Newfoundland.

broadcast spawner = release of eggs and sperm into the water for external fertilisation without parental care.

Brockman body = large and very visible islets of Langerhans (endocrine pancreatic tissue) evident in some fishes.

brodle = broddle.

broddle = to probe in the water with a stick for fish (English dialect).

brog = broggle.

broggle = to fish for eels, by troubling or agitating the water (English dialect).

brogue = broggle.

broken fish = dried and salted cod with an irregular surface, a defect (Newfoundland).

broken ice = ice covering five-tenths to eight-tenths of the water surface. Also called loose ice, loose pack ice, open ice, open pack ice, slack ice.

Bronsonian knot = a knot formed in the body towards the tail and which is moved towards the head in a living *Gymnothorax* and also presumably in hagfishes. Used to gain purchase in tearing off a mouthful of food from a large piece or in trying to escape from a hook.

brood = 1) a group of fish spawned at the same time.

brood = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for dogfish.

brood = 3) a race, a kind.

brood fish = sexually mature fish, especially those used in aquaculture.

brood hider = an ecological group of reproductive guilds (q.v.) where fish hide their eggs but do not care for them.

brood pond = a pond in which breeders are held before spawning.

brood pouch = brood-pouch.

brood stock = broodstock.

brood year = the year in which the eggs were fertilised and spawned. In some species, e.g. Salmonidae, the eggs overwinter so the eggs hatch in the following year.

brood-pouch = marsupium (the name applied to the brood-pouch in Syngnathidae and Solenostomidae. In Syngnathidae it consists of a vascularized groove formed by flaps of skin along the underside of the tail of males (subcaudal marsupium); in Solenostomidae it is a pouch formed by the pelvic fins, provided with many long filaments, and found only in the female (ventral fin marsupium)).

brooding establishment = a hatchery, where fish are hatched artificially.

broodline = the generation of pink salmon that reproduces every other year. Even-year pink salmon are reproductively isolated from odd-year pink salmon.

broodstock = mature fish retained at a hatchery to produce eggs and young. The term can include younger fish eventually to be used as spawners but not yet mature. May be used for eggs or juveniles from which subsequent generations will be produced.

broodstock pond = a pond constructed for broodstock.

brook = a small fast-flowing stream, often emerging from a spring, and generally defined as not formed from tributaries. Has a rocky bottom rocky bottom, can be quite wide but often is of no great depth. Also called creek but may be smaller than a creek in some definitions.

brooklet = a small brook.

broose = brewis.

broth = usually as fish broth, meaning water (slang).

brown cuprinol = a chemical once used to preserve fibrous fishing nets.

brown muscle = dark meat (muscle from just under the skin on each side of a fish that is darker and richer in fat than other flesh. Also called blood meat, dark muscle, red muscle).

brownbow = a hybrid of rainbow (*Oncorhynchus mykiss*) and male brown trout (*Salmo trutta*).

browning = discolouration of fish, especially of dried or canned products, caused by a deteriorative reaction between amino groups of proteins and carbonyl groups of sugars during storage. There are also flavour changes and loss of some nutritive value. Known as the Maillard reaction or non-enzymatic browning reaction.

browse = bruised or damaged fish used as bait (Cornish dialect).

browser = fish that feed by scraping biofilm or aufwuchs, *q.v.*

Bruce = 1) the nickname of the mechanical great white sharks used in the movie "Jaws", purportedly named for Steven Spielberg's lawyer, Bruce Ramer.

Bruce = 2) the shark in the computer animated film "Finding Nemo".

bruck = the offal of fish or of cattle (British dialect).

bruis = brewis.

bruise = brewis.

bruse = brewis.

brush trap = see brushwood fishery and eel tuft.

brush weir = barricade.

brushpile = small to large piles of brushwood and tree limbs lying in the water, either occurring naturally or made up as a protective area for fishes. See also brushwood fishery.

brushwood fishery = large piles of brushwood deposited in the water forming a habitat or hiding place for fishes. The brushwood can be hauled out en masse to capture the fishes or surrounded by nets and shaken.

$B_{Threshold}$  = minimum stock size threshold or MSST. At stock sizes below  $B_{Threshold}$ , the stock is considered to be overfished.

Bu = a photophore above the hind end of the upper jaw in Myctophidae. Formerly called macula buccae by some authors.

Bubba = a Queensland grouper fish that died on 22 August 2006 at the Shedd Aquarium, Chicago. He was given to the aquarium in 1987 by an anonymous donor and at that time was a female about 10 inches long but, being a protogynous hermaphrodite, became male in the mid-1990s and eventually grew to be 69.3 kg. Bubba was famous for probably being the first fish to receive chemotherapy, to treat a growth on his forehead. He was a favourite with visitors, especially children with cancer. Also called the super grouper.

bubble curtain = bubble fence.

bubble feeding = the entrapment of a school of fish (or krill) by whales. A series of bubbles are blown out by the whale as it swims to the surface. The bubbles form a ringing curtain that rises to the surface of the water and concentrates the prey in the center. The whale charges through this curtain with its mouth open, engulfing the fish.

bubble fence = a stream of bubbles from a perforated hose or pipe used to control fish movements. Also called bubble curtain or bubble screen.

bubble filter = an internal filter in an aquarium using a series of lift tubes to draw water through a foam block.

bubble float = in angling, a round and hollow float made of clear plastic and with stoppers that allow water to be added to adjust casting weight. Used to present a floating bait to rudd or carp in Europe.

bubble nest = nests composed of bubbles and secretions built by Anabantidae. Serves as a protective coating for the eggs and newly hatched young.

bubble screen = bubble fence.

bubble-eye goldfish = goldfish (*Carassius auratus*) having upward directed eyes accompanied by fluid-filled sacs. The fluid can be extracted for studies on its growth-promoting effects on fish cell cultures; the fluid regenerates and the fish need not be sacrificed.

bubbly-fisher = a fisherman who fails to catch any fish (Scottish dialect).

bubonic disease = boil disease.

buccal = 1) relating to the mouth cavity.

buccal = 2) in relation to teeth, referring to the cheek side.

buccal cavity = the mouth cavity.

buccal cirrus = one of the tentacles surrounding the entrance to the vestibule which leads to the mouth in Amphioxo. Used as an aid in securing food.

buccal funnel = the cone-shaped cavity leading to the mouth in Petromyzontiformes.

buccal gland = the gland in Petromyzontiformes which secretes a saliva-like fluid having anticoagulant, haemolytic and cytolytic properties; the secretion is called lamphredin.

buccal incubation = oral incubation (mouth-breeding or the care and hatching of fertilized eggs in the mouth. Also called, less aptly, oral gestation, e.g. certain Apogonidae, Ariidae, Anabantidae, Osteoglossidae).

buccal photophore = a light organ just above the end of the jaw in Myctophidae. Abbreviated Bu.

buccal valve = oral valve (the flap attached just inside the jaws which stop water escaping from the mouth during exhalation, helping to maintain a unidirectional flow. Usually a valve is found just inside the ring of teeth in the jaw. Posterior valves may also be present).

bucco-branchial incubation = the retention of eggs near or on the gills until hatching, e.g. in certain species of *Apogon* (Apogonidae).

bucco-hypophysial canal = the canal between the pituitary and the roof of the pharynx, probably representing a persistent Rathke's pouch and possibly having a secretory function, e.g. in *Elops*, *Polypterus*, *Calamoichthys*.

bucco-pharyngeal incubation = the retention of eggs in the mouth and pharyngeal cavities, e.g. in Apogonidae, presumably similar to or a continuation of bucco-branchial incubation.

bucco-pharyngeal papilla = one of the small protuberances on the inner mouth lining and the beginning of the gut.

bucco-pharynx = that part of the mouth used to house larvae and eggs in species which use buccal incubation.

buccopharynx = bucco-pharynx.

bucht = a certain measure of the length of a coil of fishing line. Also called bicht or bight.

buck = 1) male sturgeon or male fish generally, sometimes referring to a spawning male.

buck = 2) a large basket used to catch eels. Also called eel buck.

buck-weel = a bow-net for fish (obsolete).

bucket mouth = angling slang for a large fish, usually a bass.

buckhorn = dried cod, because it is very tough.

buckler = 1) bony shield, scute, modified scales associated with unpaired fins with a presumed hydrodynamic function.

buckler = 2) a circular piece of wood used with a lever to press dried and salted fish into barrels or casks.

buckling = a large fat herring, sometimes headed, lightly salted and hot smoked (correctly Bückling). Also called pickling in the U.S.A.

bucktail = 1) a streamer fly dressed with hair from a deer's tail, resembling a fish. Adds bulk and attraction to a lure. Usually has a long segment of hair, layered back from the hook eye to the hook bend. Also simply the hair from a deer's tail used in tying dry flies and bucktails.

bucktail = 2) jig (one to several bare hooks attached to a weighted line. The hook(s) may have a lead head (lead molded around the hook) and be dressed with, or have a skirt of, rubber, hair, silicone or plastic).

bud = an undifferentiated protuberance that appears at the initial formation of the paired fins.

büddi = buddie (a straw creel (q.v.) (Scottish dialect). Also spelled budy, buithy, böddie or bödi).

buddie = a straw creel (*q.v.*) (Scottish dialect). Also spelled büddi, buidy, buithy, böddie or bødi).

buff = to steep salted herrings in water and hang them up (Scotland).

buffed herring = salted herring steeped in water, swollen out (Scotland).

buffer = an alkaline substance with a pH over 7.0 added to preserving fluids to neutralise acids (formalin may turn acidic and should be buffered for long-term storage of fish) or to aquaria to stabilise pH.

buffer zone = an area that separates the core from human interference, as in a core off-limits to fishing.

bug colony = a colony of beetles (usually *Dermestes*) used for cleaning large fish skeletons of flesh. Also called dermestid colony.

bug fly = a cork-bodied surface fly imitating various aquatic and terrestrial organisms for angling.

buidy = buddie (a straw creel (*q.v.*) (Scottish dialect). Also spelled büddi, buithy, böddie or bødi).

buithy = buddie (a straw creel (*q.v.*) (Scottish dialect). Also spelled büddi, buidy, böddie or bødi).

bukat = bykat.

Bukelz, William = see Beukel, William.

bulb = the rounded swelling forming the main body of the esca or bait at the end of the illicium or fishing rod in anglerfishes.

bulbous = swollen or rounded in shape.

bulbus = bulbous.

bulbus arteriosus = a chamber in the heart, *q.v.*, of teleosts (see conus arteriosus in elasmobranchs). The bulbus arteriosus is the enlarged base of the ventral aorta and is incapable of muscular pulsation (unlike the conus arteriosus) but it is elastic and can enlarge or shrink in response to change in blood pressure.

bulbus oculi = eyeball.

bulbus olfactorius = olfactory bulb (a large organ of smell, e.g. in sharks. This is the most anterior part of the brain but is distinct from the telencephalon while anteriorly it merges with the olfactory nerve).

bulbus organ = electroreceptor (an organ which detects the presence of an electric current).

bulbus prop = a mushroom-shaped support for the eyeball in Elasmobranchii.

bulk = 1) to pile split and salted cod during the curing process or, when dry, for storage (Newfoundland).

bulk = 2) the quantity of herring nets shot at one time, about 50 yards.

bulk cure = salmon, cod and related species salted in alternating layers of split fish and salt and arranged so the resulting fluid (pickle) can drain away. Also called kench cure, salt bulk, bulk salted fish, round cure, round salted fish and bulk cure.

bulk fish = split and salted cod, either undried or dried and stacked for shipment.

bulk food = food of large volume and low nutritive value used in aquaculture.

bulk of food = the main mass of food, especially stomach contents.

bulk pen = a large pound on a trawler for placing cod in layers of ice.

bulk salted fish = bulk cure.

bulk shot = a heavy split shot or several shot grouped together on a fishing line. Usually placed below the halfway point between float and hook and used to sink a bait rapidly.

bulk stowage = fish mixed with ice in layers 45 cm deep on board ships at sea.

bulked fish = bulk fish.

bulking = storing loose whole fish mixed with layers of ice in a fish hold or room on a vessel. Also called bulk stowage.

bull = the boat which shoots or hauls the net in bull or pair trawling.

bull rope = lazy deckie (a rope to haul the cod end to a ship's side).

bull trawling = pair trawling (bottom or mid-water trawling by two vessels towing the same net. Very large nets can be towed in this manner by relatively small boats and the net is generally hauled alternately aboard the two vessels for processing of the catch).

bulla prootica = a swollen bony sheath which encloses the utriculus, *q.v.*

bulla pterotica = a swollen bony sheath which encloses the sacculus, *q.v.*, and is surrounded by the horizontal semicircular canal in Clupeoidei.

bullate = having a puckered or blistered appearance.

bulldog cod = a deformed *Gadus morhua* here the upper part of the head has a crown-like shape. Also called seal head cod. Called king cod in Norway and thought to bring good luck and to lead schools of cod to that country.

bullet = a bright fresh fish.

bullet sinker = a cone shaped lead weight that slides up and down a fishing line.

Bulletin of Zoological Nomenclature = the official periodical of the International Commission on Zoological Nomenclature.

bullpen trap = use of nets forming a large enclosure to trap fish in Hawaii.

bully = 1) to transfer cod from a net to vessel for splitting (Labrador).

bully = 2) fishes which are short and thick-set (English dialect).

bully net = dip-net (a bag-shaped net held open by a square or rounded frame on the end of a long pole. Used to scoop fish from the water).

bultow fishing = a series of hooks on snoods set along one line. Also called spilliard fishing, trawl fishing or spillet fishing. See also boulter, spiller, trot line, longline, etc.

bullys = a moored fishing line, with snoods and many hooks attached; used for catching conger, pollack, etc. (Cornish dialect).

bummaree = fish-jobbers or middlemen in Billingsgate Market in London who buy fish from salesmen and then retail them. Corruption of bonne marée (good fresh fish or the seller thereof).

bummreeeing = to buy up large quantities of fish to sell retail.

bump = taking of bait by a fish. Also called bite, hit and strike.

bump-net = a stiff net of chicken wire on a long handle, held near the wash of an outboard motor, used to catch male shad (*Alosa sapidissima*) in California. The shad are attracted by the prop wash, bump into the net and must then be flicked into the boat.

bump-troll = maintaining a trolled bait in the same spot by putting the boat engine in and out of gear (bumping) to hold position.

bumper = a full catch or load of fish.

bumper line = shock tippet (in angling, a heavy section of leader above the fly as protection against abrasion and the teeth of the fish).

bumping = when a lure hits a log, rock, bottom or other structure in a controlled manner in order to attract a bite.

bunch = school (a group of fishes, usually constituted of the same species, which tends to orient and move in the same direction. There are obligate and facultative schoolers. The latter can only be forced to stop schooling momentarily by considerable violence and will not maintain a state of random orientation. See aggregation).

bund = 1) the elevated rim around a constructed pond.

bund = 2) an impoundment used to simulate riverine conditions for breeding major carps. May be perennial or seasonal, common in India.

bundh = bund.

B<sub>unfished</sub> = the unfished or pristine biomass.

bung = a small conical piece of plastic inside a fishing rod used as an anchor to hold the end of an elastic, *q.v.*

bunt = 1) the bag part in a seine or the strengthened, central part of a purse seine, where fish are concentrated when hauling in the net. Also called bag.

bunt = 2) the section of the lower wing of a trawl, overhung by the square.

**buoy** = a float moored to the bottom that marks a navigational channel, a position such as a shoal, a wreck or a net or trap. Also used to show the position of an anchor for attaching a boat and then called a mooring buoy. Pronounced "boy" in English and "boo-ee" in American. Variously coloured and shaped, of widely different sizes, and may have a whistle, bell or gong.

buoy pole = a buoy with a pole sticking out the top so it can be seen at a distance.

buoyancy compensator = buoyancy control device. Abbreviated as BC.

buoyancy control device = an expandable bladder in the form of an expandable vest used with scuba apparatus. It can be inflated with air from the scuba tank to increase buoyancy while diving and is used for resting, swimming or lending assistance to others under water. It is deflated by special air-dump valves or hoses. Also called a buoyancy compensator (BC). Abbreviated as BCD.

buoyant egg = a free-floating or pelagic egg.

burden = a parcel of fish (Scottish dialect). Also called back burden.

burley = berley, an erroneous spelling.

burn = 1) a small stream, rivulet, or brook (Scottish and Saxon).

burn = 2) in processing cod, too much sun or salt exposure, spoiling the fish.

burn = 3) burn the water.

burn the water = to kill salmon at night with a leister (*q.v.*) using a light to see (English and Scottish dialect).

burning = retrieving a fishing lure fast enough to cause it to splash at the surface. Also called ripping or buzzing.

buro = dry salted and split freshwater fish, repacked with rice, salt and a fermenting agent (Philippines).

burping = applying pressure on the sides of a fish taken from depth to release expanded air from the air bladder.

bursa = a purse from the Latin and so used for any enclosed sac or pouch.

bursa entiana = a chamber-like enlargement found in the pyloric part of the stomach of some Elasmobranchii.

burst = a sudden and violent appearance of a shoal of fish.

burst belly = severe belly burn resulting in a ruptured abdomen, usually in pelagic fishes.

burst speed = the maximum speed a fish can maintain for a short period (5-10 seconds). Used in seizing prey or escaping a predator. Also called darting speed.

bush rope = the main rope to which the row of herring drifting gill nets are attached.

busk = to dress flies for fishing.

busker = a fisherman who dares all weathers (Cornish dialect).

busktail = a lure or streamer fly having a tail made of long strands of deer hair.

busom = bosom.

busum = bosom.

buss = a boat used in fishing for herrings (English dialect).

bustard = a large moth or artificial bait for fish (English dialect).

but = butt (3).

but = butt (4).

butt = 1) a cask or barrel used to pickle or store fish. Held 4 quintals of fish, 1 quintal in Lunenburg Nova Scotia being 112 pounds.

butt = 2) the bottom or reel end of a fishing rod.

butt = 3) putt (a tapering basket used in making fish weirs on the Wye and Severn rivers of England. Putts are placed in groups of six or nine between pairs of stakes, each group between two stakes is called a puttcher. Also called kype).

butt = 4) any flatfish (English dialect).

butt end = part of the sound-bone or backbone closest to the head of a cod fish (Newfoundland).

butt cure = fish that have been treated with salt in a watertight container (or butt) so that the fish are cured in the pickle that is formed.

butt indicator = a hinged bite indicator clipping onto a fishing rod just above the butt ring. Used in windy conditions as its position can be more easily protected.

butt rest = a small u-shaped rod rest for holding the handle of a fishing rod when legering or float fishing.

butt ring = the first ring on a fishing rod above the reel. This ring is usually larger than other rings to facilitate casting.

butt seat = a half-moon seat used by anglers to lean against. Also called bike seat.

butt section = the thicker end of a tapered leader that is tied to a fly line.

butt-end = butt end.

butter a whiting = to flatter or wheedle (English and Scottish dialect). See also "give one whitings but (= without) bones".

butterflied = prepared as a butterfly fillet.

butterfly = an L-shaped steel plate shackled between the dan leno spindle and legs. Also called arm, banana, boomerang, dan leno arm, dan leno bracket, dan leno spreader, devil's elbow, spreader bar.

butterfly dropper knot = a knot in angling used to form a loop in the main line. May slip if not properly tightened and best for heavier lines. Various websites have animated steps showing how to tie this knot.

butterfly fillet = a fillet from each side of a fish left joined together (usually at the gut region but can be at the backbone) after removal from the backbone. Also called angel fillet, cutlet, double fillet or when smoked golden cutlet.

butterfly net = a net with two wings shaped like those of a butterfly in the form of an oval scoop net. Used on Mexican lakes.

button-up fry = a salmonid fry that has not completely absorbed its yolk sac and has emerged from its spawning gravel (stages at 45°F in chinook salmon are green = 0 days, eyed = 38 days, sack fry = 69 days, swim up = 92 days and button up = 115 days).

buttoned fry = button-up fry.

buy-back = the purchase of vessels and fishing licences from producers by a government agency to reduce fishing effort and capacity.

buzz bar = a horizontal bar screwing onto the top of a rod pod, *q.v.* Multiple rod rests can be screwed in the buzz bar supporting several rods at once.

buzzbait = buzzer.

buzzer = 1) a spinner designed to make a disturbance in the water's surface by means of rotating blades.

buzzer = 2) an inline spinner with a prop blade instead of a normal blade.

buzzing = retrieving a fishing lure fast enough to cause it to splash at the surface. Also called ripping or burning.

BWD = body weight daily (a measure of food requirement and/or uptake expressed as a percentage or as a decimal fraction).

by boat = bye boat

by boat fishery = cod fishery made from small boats in inshore waters.

by boat keeper = a man who operates inshore fishing craft (Newfoundland).

by boatman = a fisherman engaged in the inshore cod fishery using small craft in Newfoundland.

by (the) salmon = an oath (obsolete). See also so help me salmon.

by-catch = bycatch.

by-product = any part of the catch which is kept or sold by the fisher but which is not the target species.

bycatch = fishes caught incidental to the target species; also called incidental catch or accidental catch. These fishes are usually of lesser value than the target species, and are often discarded. Some bycatch species are of commercial value and are retained for sale. The bycatch often consists of the juveniles of commercial species, and their loss has a deleterious impact on the overall yield obtained from a certain area. In a commercial fishery there are economic discards (fish thrown away for economic reasons, e.g. too small, damaged, not enough commercially value, etc.) and regulatory discards (fish thrown away because of the regulations as to size or species allowed to the fishery). Fish released alive under catch-and-release management programmes are not considered as bycatch. Also spelled by-catch.

bycatch excluder device = a mechanism attached to a net (such as the cod end of a trawl) to allow the escape of young fish or of other, endangered species such as turtles, seals and dolphins.

bycatch reduction device = bycatch excluder device.

bye-boat = a small inshore fishing boat in Newfoundland. Undecked and of varying design, size and rig. Originally owned and operated by fishermen coming from England annually to take cod.

bye-boat fishery = cod fishery made from small boats in inshore waters.

bye-boat keeper = a man who operates inshore fishing craft (Newfoundland).

bye-boatman = a fisherman engaged in the inshore cod fishery using small craft in Newfoundland.

bykat = a male salmon based on its development of a kype (Angus dialect). Also spelled beikat and bukat.

bykill = bycatch.

bypass = bypass channel.

bypass channel = a channel running along the side of an aquaculture pond. Used to regulate water level. See also supply channel.

bypass systems = moving screens lowered into turbine intakes to divert fish away from turbines at hydroelectric dams. Bypassed fish can then be returned directly to the river below the dam. In some cases facilities exist to load bypassed fish onto barges or trucks for transport to a release site downstream from all dams in a series.

## C

C = 1) abbreviation for caudal fin.

C = 2) abbreviation for caudal fin rays.

C = 3) Carboniferous, a period within the Paleozoic Era ca. 365-290 million years ago.

C = 4) the Roman numeral 100.

C = 5) degrees centigrade, a measure of temperature. Note that 12°C is a temperature while 12C° is a number of degrees or a range, e.g. 20-31°C inclusive.

c. = 1) abbreviation for *cum*, meaning with.

c. = 2) abbreviation for *circa*, meaning approximately, about.

c & s = cleared and stained (a specimen with some tissues rendered transparent by various chemical treatments while others are stained to enhance their visibility. In fish osteological studies, the flesh is cleared with enzymes or potassium hydroxide and the bones stained red with alizarin red S and the cartilage blue with alcian blue).

C1 = principal caudal fin ray.

C2 = procurent caudal fin rays.

C/E = catch per unit effort.

ca. = abbreviation for *circa*, meaning approximately, about.

caal = a mill-dam or weir; the outlet of water from a dam (English dialect).

caapie = cappie.

caavie = kavi (a sinker on a fishing line (Scottish dialect). Also spelled kaavie).

cabbie = a small cod caught near the shore, not big enough for salting down and selling, but of a nice size for eating fresh (Scottish dialect). Also spelled kabbi or kabby.

cabe = to steal fish from the nets or the carts which carry them to the curing cellars (Cornish dialect).

cabelew = cod or pike hung and salted for a few days but not thoroughly dried (Scottish dialect). Also spelled cabylou, kabbilow and kabbelow.

cabesta = the space between the hook and lead in a fishing line (Cornish dialect).

cable = 1) a formerly used, horizontal, nautical measurement. Traditionally 120 fathoms, 720 feet, 219.4 m or 0.1185 nautical mile. The British Navy used the cable to equal exactly 0.1 nautical mile, 608 feet or 185.3 m.

cable = 2) to entangle or twist a net (Newfoundland).

caboolen stone = a stone suspended from a rope, and kept continually plunging, in order to scare pilchards when in the net, and prevent them from escaping (Cornish dialect).

cabylou = cabelow.

cachexia = weight loss, muscle wasting, loss of appetite, and general debility, usually due to a chronic disease, or malnutrition.

cade = an older name for a cask used to pack and measure fish. A cade of herring comprised 720 fish, a cade of sprats at Aldborough was a thousand. Also spelled caid.

cader = a small wooden frame on which a fisherman keeps his line (English dialect).

cadger = an itinerant dealer in fish (English dialect).

caducous = readily shed, deciduous, e.g. scales in *Clupea* which are easily detached.

caeca = plural of caecum.

caecum (plural caeca) = a blindly ending sac arising from the gut or other hollow organ, e.g. pyloric caeca, q.v.

caecum cloacae = a gland of unknown function communicating with the cloaca of Dipnoi.

caenogenetic = of recent origin.

Café de Paris butter = a mixture of herbs and spices, Worcestershire sauce, and the ichthyological ingredient, anchovies, whipped into a butter. The butter is shaped into a roll and a piece is sliced off and allowed to melt on hot meat.

caff = refuse or unsaleable fish (Cornish dialect).

caffler = to deal in caff or unsaleable fish (Cornish dialect).

cage = a box-shaped enclosure of wire or netting used for controlled aquaculture in open water.

cage culture = rearing of fish in cages, on the bottom or floating. Cages may be made of wire or netting.

cage reel = 1) a fishing reel that is light, made of wire and has donut-shaped spool.

cage-reel = 2) a fishing reel with spools (called skeleton spools) and side plates with pieces cut out to ventilate the line.

cage swimfeeder = in angling, an open-ended plastic or metal mesh container filled with bait. Its structure allows more rapid release of bait through the mesh and it offers less resistance to water currents so that less weights are needed to hold it on the bottom.

CAGEAN = catch-at-age-analysis; the estimated number of fish caught, tabulated by fish age and year of capture, and by other factors such as gear or nation. Catch-at-age may be estimated on the basis of catch-at-size, using age-length keys or cohort slicing.

cahill = coghel.

cain fish = cane fish.

caid = cade.

caisie = cassie.

caiss = cassie.

caisy = cassie.

Caisson's disease = gas bubble disease. Supersaturated gases (>125%) in water entering the body fluids of fish causing bubbles, an embolism. Also called bends or decompression sickness.

caivel = dividing fish from a actch by lots (British dialect).

cake = fish cake (1) fish flesh mixed with potatoes, seasoning and sometimes eggs, butter and onions and formed into cakes or patties and fried in fat).

cake = fish cake (2) fish before drying in the manufacturing process for fish meal).

calcareous spherule = otoconium (ear dust; a minute transparent calcite crystal with well developed faces secreted within the labyrinth and mixed with mineral particles or otarenae).

calcified cartilage = cartilage containing calcium salts and thus strengthened and hardened. Found in vertebrae and teeth.

calcitran = a substance produced by the ultimobranchial gland (*q.v.*) which helps regulate the calcium level.

calcium cyanamide =  $\text{CaCN}_3$ , used in aquaculture as a pond disinfectant, especially for *Myxosoma cerebralis*, the cause of whirling disease. Also called lime nitrogen.

calcium generator = a device maintaining the calcium level in an aquarium having corals. Carbon dioxide and a calcium-rich medium are injected into the aquarium, the carbon dioxide reducing the pH and dissolving the calcium medium for uptake by the corals. Calcium level is about 420 p.p.m.

calcium reactor = calcium generator.

calf = a large piece broken off an iceberg, glacier or floe. See calve.

caliculate = cup-shaped.

calculi = plural of calculus.

calculus = a solid concretion made up of minerals and salts; found in ducts, cysts, hollow organs, etc in fishes, notably urinary ducts.

caldeirada = a Portuguese fish stew with potatoes onions, garlic, tomatoes and parsley. A wide variety of fishes are used including skates, sardines, tuna, mackerel, halibut, flounder, monkfish, cod and haddock.

Californian incubator = a horizontal tray for hatching eggs, especially salmonids.

Californian tray = Californian incubator.

caliology = the study of nests, burrows, tubes, etc. constructed by animals.

calipers = an instrument used to measure thickness or length of an object, such as structures on a fish, comprising a sliding, graduated scale (vernier) and points or jaws. May record distance or width by means of a vernier, a dial or electronically.

call-back = the weir or dam put across a river or stream to turn water to the mill (English dialect).

call-head = the top of a weir or dam crossing a stream (English dialect).

callar = caller.

caller = fresh, in proper season, newly caught or gathered, not flabby or stale, said of fish and vegetables (English dialect). Also spelled callour, callar, calour, caloure, calloure, callowr, and callor.

callicarpone = a plant piscicide from leaves of *Callicarpa candicans* (Verbenaceae), used in the Caroline and Philippine islands. Other piscicidal plant chemicals include huratoxin, ichthyothereol, inophyllolide, juglone, justicidin, maingayic acid, rotenone, and vibsanine, all q.v.

callor = caller.

callour = caller.

calloure = caller.

callous pad = pharyngeal pad (the covering of the pharyngeal process against which the pharyngeal teeth grind food).

callowr = caller.

callus = any, hard thickened epidermal area, usually the result of irritation or friction.

calour = caller.

caloure = caller.

calve = to break off a portion or calf, as of an iceberg, glacier or floe.

calver salmon = a fish dressed as soon as it is caught (Lancashire dialect).

calvert salmon = a salmon recently caught and still warm (English dialect). Also spelled colvert salmon.

calyculate = covered by cup-shaped structures.

cambered otter board = an otter board, q.v., of trawl curved in fore and aft directions.

Cambrian = the earliest period of the Palaeozoic Era, ca. 570-504 million years ago. Abbreviated as C.

camera = a chamber or cavity, e.g. those containing the otoliths in the ear.

camera aerea Weberiana = a cranial diverticulum of the gas ladder which separates from the main portion. It can disappear or remain small.

cameral = a spawned haddock (Scottish dialect). Also spelled camerel, cawmirl, kameril and kemerel.

camerel = camerel.

cammo lead = a camouflaged lead weight used by anglers and meant to disguise its presence from fish

camp = fish camp (a camp used as a base for angling by a group of people; may be very simple or have accommodation and other facilities).

camptotrich = camptotrichium.

camptotrichia = plural of camptotrichium.

camptotrichium (plural camptotrichia) = rays which support the fin membranes in Dipnoi and Crossopterygii. Actinotrichia are not found distal to the camptotrichia in the fin membrane. This suggests that they are homologous to the ceratotrichia of Elasmobranchii but for the fact that they are segmented, branched and more or less ossified like lepidotrichia. They are covered with scales. It is not clear whether they are segmented and branched actinotrichia or lepidotrichia which have lost their terminal actinotrichia.

can = a hermetically sealed container. Fish are often sterilised and canned.

canal = 1) an artificial watercourse, usually with clearly defined banks and depths, controlled water levels, and often locks to allow movement of vessels between different levels. Canals may allow movements of fishes between previously unconnected drainages.

canal = 2) in anatomy, an open or closed channel; a tube or tubule.

canal bone = one of series of bones of dermal origin that enclose the neuromasts and seismosensory canals. May be formed from one or more ossification centres. Also called sensory canal bone or sense organ bone.

canal catapult = in European angling, a small catapult used in restricted areas like canals to deliver ground bait to an area as an attractant to fish.

canal neuromast = sense organs found in lateral line canals in the dermis. See also superficial or free neuromasts, large pit organs and small pit organs.

canal stand = in European angling, a small metal platform for bait and gear that stands by itself on the hard canal banks.

caniculate = with grooves or channels.

canaliculi = plural of canaliculus.

canaliculus (plural canaliculi) = 1) a small branch of a canal or duct; a groove or tubular channel.

canaliculus (plural canaliculi) = 2) a small tubule interconnecting lacunae to neighbouring capillaries.

canalis hæmalis (plural canales hæmales) = haemal canal (the tube formed by all the haemal arches, through which run the caudal vein and dorsal aorta).

canales hæmales = plural of canalis hæmalis.

canalis neuralis (canales neurales) = neural canal (the spinal cord canal through the neural arches).

canales neurales = plural of canalis neuralis.

canalis Sclemmii = a circular vessel located in the angle between the annular ligament (which binds the iris and cornea) and the cornea.

canales semicirculares = plural of canalis semicircularis.

canalis semicircularis (plural canales semicirculares) = semicircular ear canal (fluid-filled canals embedded in the cranium and concerned with balance and hearing. Gnathostomata have 3 canals, lampreys have 2 (lacking a horizontal canal), and hagfishes have only one canal, perhaps appearing secondarily by the joining of two canals). Fossil Cyclostomata may have had 7 or more semicircular canals.

cancellous = having cavities, spongy, porous, or reticulate, usually of bone.

candidate species = a fish species being considered for protection, e.g. under the Endangered Species Act in the U.S.A.

candle = the rubbery sheath enclosing the fertilised eggs of *Squalus acanthias*. It dissolves after several months and the pups are free to develop in the uterus.

candling = placing fish or fish fillets on a transparent table illuminated from below so that parasites and defects can be detected by the light shining through the flesh.

candy bait = in angling, slang for squid used as bait.

cane fish = rent for fishing, paid in kind (Northumberland dialect). Also spelled cain, kain and kane fish.

cane pole = a long bamboo pole used in stillwater fishing, with the line attached to the tip but without a reel or line guides.

Canestrini's organ = a bony process or plate at the base of the first (unbranched) and second (first branched) ray of the pectoral fin of male *Cobitis*.

Canestrini's scale = Canestrini's organ.

canine = a large, pointed, conical or blade-like tooth. Usually distinctly larger than surrounding teeth and few in number. Some are hinged to permit entry but hinder escape of prey. Often found in carnivores, e.g. in some Blenniidae, Serranidae, Labridae.

caniniform = shaped like canine teeth. Caniniform teeth are used to grasp, pierce and restrain prey and may be hinged and depressible to allow prey to be swallowed, locked erect to capture prey.

canister filter = an efficient form of aquarium filter comprising a canister internal or external to the aquarium. A pump forces water through the canister with its contained biological (bio-substrate), chemical (carbon) and physical (floss) filters. Canisters need to be cleaned regularly. External canisters are not normally used for small aquaria.

canned fish = fish packed in metal containers with hermetic sealing and heating to destroy bacteria. Pickled fish with a pH below 4.5 require less heat than fish products with a higher pH. Some fish types do not can well, e.g. those with white flesh, as major changes in colour, texture and flavour occur in processing. Fatty fish species such as herring, mackerel, salmon and tuna make good canned products.

canned fish ball = haddock or a related type of fish flesh made into balls with potato-flour and cereals, and put in a fish bouillon. Often stored in a one-pound can where they may be heated before serving, or removed and fried or baked. Found in Scandinavia.

Cannery Row = where sardines were canned in Monterey, California and the title of a 1945 book by John Steinbeck.

cannibal viviparity = uterine cannibalism (the condition in some sharks where the embryos feed on eggs and smaller siblings inside the mother).

cannibalism = eating members of one's own species, common in fishes.

cannonball = a very heavy, round weight (up to 12 lbs or 5.5 kg) used in deepwater fishing with downriggers.

canoe = a light, long and narrow boat with pointed ends, curved sides and paddles for propulsion. Often light enough to be carried around obstructions by one person.

canopy = overhanging vegetation, branches and leaves, providing shade and cover for fishes. Crown cover is greater than 1 metre above the water surface while overhanging cover is less than this (or less than 0.3 m). The latter in particular provides protection for fish from insolation and aerial predators.

cantal = quintal (*q.v.*).

canthaxanthin = an orange-red carotenoid pigment found particularly in salmonid flesh derived from the diet and sometimes added to the diet of cultured fish. It is not a permitted food additive in some countries. See also astaxanthin.

cantor = a small frame of wood on which a fisherman keeps his line (Cornish dialect).

canyon = 1) a deep gorge with steep sides and often a stream, characteristic of arid and semi-arid regions.

canyon = 2) a relatively narrow, deep depression with steep sides, the bottom of which generally has a continuous slope, developed characteristically on some continental slopes in the ocean.

cap = a cover over a container extending down on all sides, a jar lid. For liquid-preserved specimens like fish polypropylene caps are preferred as metal lids eventually rust and harder plastic lids crack.

cap liner = a flat disc fitting inside a cap ensuring a tighter seal. Cardboard liners usually shrink away from the lid when used with liquid-preserved specimens like fish and foam polyethylene liners are preferred.

cap net = any net used to retain or hold fish, even on a commercial scale (Newfoundland). See also keepnet net, kelp net or kipp net.

capacity = fishing capacity is the quantity of fish that can be taken over a period of time (year, season) by a fishing unit, e.g. an individual, community, vessel or fleet, assuming that there is no limitation on the yield from the stock usually expressed as gross tonnage, hold capacity, or horsepower. Reflects potential rather than nominal fishing effort. It may be the maximum amount of fish that can be produced by a fishing fleet if fully utilized, given the biomass and age structure of the fish stock and the present state of the technology.

cape = a prominent land mass jutting out into the sea.

cape boat = a large fishing boat, rigged fore and aft, used to fish the inshore banks of Newfoundland, particularly Cape St. Mary's grounds, on the south coast.

Cape Cod = a Massachusetts cape named in 1602 by Bartholomew Gosnold for the multitudes of fish which vexed his ship.

Cape Cod turkey = a salted cod in Massachusetts.

Cape Island vessel = a speedy fishing vessel, 32-45 feet long (and up to 57 feet), carrying a crew of two, of carvel construction with an inboard engine amidships and a shelter forward. Used for herring and groundfish gillnetting, inshore longlining, shallow water stern trawling, herring pumping and trolling. Also called snapper and Cape Islander.

Cape Islander = Cape Island vessel.

capelin = caplin.

capelin school = capelin scull.

capelin scull = the annual migration of *Mallotus villosus* to spawn on beaches in June and July. The commercially important offshore cod, *Gadus morhua*, followed the scull and indicated the start of the inshore fishery in eastern Canada.

capillary bed = the network of capillaries in a particular area or organ of the body.

capita = plural of caput.

capital stuffing = investment of more money by commercial fishermen in fishing capacity to offset regulations that make fishing effort less effective. Usually involves technical gear such as deck handling machinery, multiple echo-sounders, sonar, etc.

caplin = capelin, *Mallotus villosus* (Osmeridae) (Newfoundland). This fish appears on beaches to spawn in June and July, followed by the commercially important cod (*Gadus morhua*) which feeds on them. Capelin are netted for bait, for manuring fields, or dried, salted, smoked or frozen for eating.

caplin bait = capelin netted for use as bait, especially in trawl-fishing for cod in Newfoundland.

caplin baiting = 1) a quantity of capelin taken aboard a vessel in port at one time for use in the Newfoundland Bank fishery for cod.

caplin baiting = 2) a fishing voyage to the Newfoundland Banks, the length being fixed by the supply of capelin bait aboard ship.

caplin bunting = a grade of net, with very fine mesh, for catching capelin (Newfoundland).

caplin cart = a two-wheeled, horse-drawn cart formerly used to carry capelin from the shore to the fields for fertiliser in Newfoundland.

caplin fishery = the organised fishery for this species on a large scale for processing (Newfoundland).

caplin glut = an abundance of capelin.

caplin mesh = the small mesh of cast-nets used to catch capelin (Newfoundland).

caplin pit = a hole in the ground into which capelin are thrown to be used as fertilizer (Newfoundland).

caplin run = capelin scull.

caplin schule = capelin scull.

caplin scull = capelin scull.

caplin scull fishery = the cod fishery during and after the spawning season of the capelin (Newfoundland).

caplin scull salmon = smaller salmon migrating to fresh water during June and July (Newfoundland).

caplin scull weather = wet, foggy weather which often coincides with the spawning season of capelin in June and July (Newfoundland).

caplin season = the months June and July, when capelin appear inshore in Newfoundland.

caplin seine = a seine with small meshes used to catch capelin (Newfoundland).

caplin sick = cod glutted with capelin.

caplin skiff = a large undecked boat employed to catch caplin (Newfoundland).

caplin spawn = the eggs of capelin on rocks or seaweed.

caplin time = caplin season.

caplin trap = type of fixed fishing-gear used in inshore waters to take capelin.

caplin trip = a voyage using capelin as bait in the Bank fishery of Newfoundland.

caplin voyage = the taking of cod in traps during the period June to July when the fish follow capelin inshore in Newfoundland.

caplin weather = foggy, wet, and sometimes cold weather which usually coincides with the appearance inshore of capelin to spawn in early summer in Newfoundland.

capline = caplin.

capling = caplin.

capon = 1) a castrated cock, fattened for the table.

capon = 2) a red herring or other kinds of fish (slang). See Crail's capon, Glasgow capon, Severn capon, and Yarmouth capon.

capon = 3) called "a fish out of the coop" by monks who wished to evade the Friday fast by eating chickens instead of fish.

cappie = a heavy stone used as a sinker to a fishing line (Shetland Isles dialect). See also caapie, cappie-stone and bolta stone.

cappie-stone = cappie.

capsula auditiva (plural capsulæ auditivæ) = auditory capsule (cartilaginous skeleton about the inner ear in Elasmobranchii, a chondral skeleton in bony fishes comprised of the prootic, opisthotic (or its replacement), intercalar, epiotic (or exoccipital), sphenotic, pterosphenoid and basiphenoid as walls and floor with the parietals and frontals as the roof).

capsulæ auditivæ = plural of capsula auditiva.

capsular ethmoid = a paired perichondral bone on the inner concave walls of the nasal capsule.

captive brood stock = fish raised and spawned in captivity.

captive broodstock program = collection of individuals (or gametes) from a natural population and the rearing of these individuals to maturity in captivity.

captive propagation = reproduction of fish in a laboratory or hatchery for commercial or conservation reasons.

capturability = the ease or difficulty of catching a given species or stock under defined conditions. Also called catchability.

capture = diversion of water flow in the upper reaches of a stream by the headward growth of another stream.

capture fishery = the sum or range of all activities to harvest a given fish resource. It may refer to the location, the fish species sought, the gear used, the social characteristics, e.g. artisanal, industrial, the purpose, e.g. commercial, subsistence, or recreational, as well as the season.

caput (plural capita) = head (everything on a fish anterior to the posterior border of the opercular bone and/or its membrane; behind this is the trunk as there is no neck in fish).

caput manubrii = head of the manubrium or cranially-directed arm of the incus, the third Weberian ossicle.

caquès = herring usually stacked in barrels with salt, after removal of viscera by means of a cut below the gills (France).

car = carr.

car names = Plymouth Barracuda, Corvette Stingray and Hyundai Tiburon (Spanish for shark).

car pot = car trap.

car trap = a wooden box or other container to hold live fish (Newfoundland). See also live box.

carangiform = type of undulatory locomotion in which the body inscribes less than half a wavelength at any one time. See also anguilliform, labriform, ostraciiform, thunniform.

carapace = a bony shield covering the back generally, but also used for the plates encasing the whole body in boxfishes (Ostraciidae).

carbon fibre = a strong and rigid fibre used in manufacturing fishing rods.

Carboniferous = a period within the Paleozoic Era ca. 365-290 million years ago. Abbreviated as C.

carcass = a fish dressed (prepared) as food.

carcass survey = a method used to estimate numbers of spawning salmon from the carcasses of recently-spawned fish. A representative number of carcasses are tagged, returned to the river, and the number of tagged and untagged carcasses observed during subsequent surveys.

card = a flat piece of wood, thin and oblong, about four or more inches long and of varying width, used as a guide to the size of mesh required when making a net (Newfoundland).

card shark = cardshark.

cardiac = referring to the heart. In the stomach, that portion or region next to the oesophagus (as opposed to the pyloric region). A better term would be corpus or body.

cardiform teeth = short, fine to coarse and numerous pointed teeth arranged in distinct rows, like the wire bristles on wool cards, e.g. in Ictaluridae, Percidae and Serranidae.

cardinal vein = a bilaterally paired longitudinal vein. The anterior cardinal vein returns blood from the head and the posterior cardinal vein from the trunk, joining together as the common cardinal vein (which is also called the duct of Cuvier or incorrectly the vitelline vein). The common cardinal vein leads across the yolk cell to the heart's sinus venosus.

cardioid = heart-shaped.

cardioid scale = a scale with a notch on the posterior edge, e.g. scales between the ventral fins of *Esox*.

cardshark = an expert card player, usually a professional gambler, and often used for a cheater. Based on the predatory reputation of the shark. Modified from cardsharp. See also loan shark and poolshark.

carina = keel.

carinate = with keel or ridge along the mid-line.

carlin book = karlen book (the book in which a fish catch was registered (Scottish dialect)).

Carlisle hook = a hook shape characterised by a long shank, a round bend and a straight, offset point.

carne carne = carne à carne, a preparation of salted anchovies from which the excess surface salt in the first preparation has been removed. The anchovies are laid out flat in regular layers, sprinkled with salt and then pressed (France).

carnivore = animal or flesh-eater.

carnivorous = animal or flesh eating; zoophagous.

carofur = nifurprazine (a chemical (1-(5-Nitro-2-Furyl)-2-(6-Amino-3-pyridazl) ethylene hydrochloride) used to combat bacterial infections in fishes, particularly with *Aeromonas salmonicida*).

Carolina rig = a deepwater, weed avoiding angling rig usually comprising an soft plastic worm or crayfish, an 18-30 inch leader, a barrel swivel and a hook embedded in the bait. Usually fished just off the bottom.

carotenoid = a carbon compound found in the eggs, gonads, liver, flesh and chromatophores of fishes, to which it imparts yellow, orange and red colours. Taraxanthin, canthaxanthin, lutein, zeaxanthin, astaxanthin and carotene carotenoids are found in fishes, although their origin is in the diet as the fish do not produce them.

carotid artery = an artery originating at the junction of the first two aortic arches and supplying the anterior brain.

carouselling = two fish circling one another rapidly, head to tail.

carp = 1) the Carp Family (Cyprinidae), the most speciose freshwater fish family with over 2420 species.

carp = 2) *Cyprinus carpio*, the common carp, widely used in aquaculture and the eponymous member of the Carp Family, Cyprinidae.

carp = 3) to find fault, complain unreasonably. See also carping.

carp = 4) the shape of the city of Tsuenchen-fu, China, built to resemble this fish when viewed from the air. Ancient Chinese cities were often built in this fashion, to resemble mythological creatures, animals and symbolic designs. See also fish net.

CARP = 5) acronym for Copyright Arbitration Royalty Panel, Washington, D.C., which seems fairly self-explanatory and unfishy. Various other unfishy acronyms turn out as carp, have carp, the fish, as an icon or symbol, and are not listed here; includes computer programmes, medical associations, cardiac acronyms, phenomenology, email service, travel agencies, etc.

carp = 6) term used for the anchovies found on pizzas. See also guppies.

Carp = 7) a town near Ottawa, Ontario where common carp are not native; probably based on members of the family Catostomidae, some of which were called "carpe" in French. Could be carpe à cochon, now meunier noir or white sucker, *Catostomus commersonii*.

carp = 8) talk, speak, prattle; not necessarily about fish.

carp = 9) a heraldic device, e.g. of Verzej, Slovenia.

CARP = 10) Canadian Association of Retired Persons.

carp mumblings = small depressions left by the feeding action of carp, about 0.5-0.7 cm across.

carp papillomatosis = carp pox.

carp pole = a long and strong fishing rod with put-in joints and elastics, q.v., used for carp (*Cyprinus carpio*) fishing in Europe.

carp pox = one of the oldest known fish diseases found in cultured carp, other cyprinids, pike-perch and aquarium fishes. It is caused by *Herpesvirus cyprini*. Also known as carp papillomatosis, epithelioma papulosum, fish pox, cyprinid herpesvirus I (CHV). Skin lesions appear as the water temperature drops in winter as small milky-white spots that merge and cover large skin areas.

carp rod = specialised rods used in fishing for *Cyprinus carpio* in Europe. Usually about 11-12 feet (3.4-3.7 m) long with test curves of 1.5-3.5 lb (0.68-1.59 kg) and stronger than most rods used in fresh waters in Europe (where most fish are smaller than carp).

carp sack = a specialised, dark, padded sack used under water for holding carp caught by angling. The sack covers the head and eyes and keeps the fish calm so it is not injured.

carp sling = a specialised sling used for weighing trophy carp and designed not to injure the fish or remove its protective mucus.

carp streamer = a carp-shaped wind sock flown in Japan on a national holiday called "Children's Day" (5 May). They are flown in the breeze to honour sons and to hope they grow up strong and healthy. The wind socks are made by drawing carp patterns on paper or cloth and are a few centimeters to meters long, the longest having been 100 metres. The Japanese name is koinobori.

carp-like = having a body shape similar to that of the carp, *Cyprinus carpio*, i.e. deep-bodied and rounded.

carpaholic = an addict of carp (*Cyprinus carpio*) fishing.

carper = people ready to catch herrings that break from the net on its rawing on shore (Irish dialect).

carping = 1) nagging or complaining, petty or unjustified criticism, quibbling over insignificant details; nothing to do with carp (*Cyprinus carpio*).

carping = 2) adjective used by anglers in reference to anything to do with fishing for carp (*Cyprinus carpio*).

carps = plural of carp in its various meanings above.

carr = a pool, fen or bog. Also spelled car.

carrion = animals used by fish as food when dead and often partially decomposed.

carrying capacity = 1) the biomass of a population or the number and type of species that a given environment can sustain over the long term. May refer to level of use, at a given level of management, which a natural or man-made resource can sustain itself over long period of time.

carrying capacity = 2) the sustainable recreational use of a water body.

carrying capacity = 3) virgin biomass, q.v.

carrying capacity = 4) the holding capacity of a fishing vessel.

cartail bully = cartel bully.

carteel bully = cartel bully.

cartel bully = a large boat or barge used as an extra vessel in carrying fish (Newfoundland). Also spelled cartail and carteel bully.

cartesian well = artesian well (a deep-drilled well where the water is forced to the surface by hydrostatic pressure. Some fishes have been found in such wells).

cartilagines coracoideæ = plural of *cartilago coracoidea*.

*cartilago coracoidea* (plural *cartilagines coracoideæ*) = coracoid cartilage.

cartilage = the flexible, semi-rigid connective tissue consisting of rounded cells (chondrocytes) in a matrix with collagen fibres and low in calcium and phosphate salts. Serves to support the body. It is not as strong as bone but is lighter and more flexible. It is incompressible and returns to its original form. Cyclostomata and Chondrichthyes have an entirely cartilaginous skeleton while other fishes have both cartilaginous and bony elements in the skeleton. Forms include hyaline, elastic, fibrocartilage and calcified cartilage, all *q.v.*, cited here in order from least to most dense. Also called gristle, especially when ingested by humans.

cartilage bone = bone formed by the ossification (osteogenesis) of a cartilaginous precursor. Cartilage bones can be classed as parachondral, epichondral or endochondral depending on whether ossification starts in connective tissue surrounding the cartilage, in the perichondrium or inside the cartilage respectively. Ossification may follow two of these paths but the end results cannot be distinguished whichever route(s) are used. Perichondral and parachondral cartilage bones go through two stages, metaplasia where connective tissue becomes cartilage and neoplasia where cartilage becomes bone. Chondrolysis or destruction of cartilage precedes neoplasia. Endochondral bones are formed by this process exclusively.

cartilagines hypobranchiales = plural of *cartilago hypobranchialis*.

cartilagines meckeli = plural of *cartilago meckeli*.

cartilagines pharyngobranchiales = plural of *cartilago pharyngobranchialis*.

cartilagines scapulares = plural of *cartilago scapularis*.

*cartilago hypobranchialis* (plural *cartilagines hypobranchiales*) = hypobranchial (one of a series of deep, paired ventral cartilages on the lower part of the gill arch. The *os hypobranchiale* in bony fishes, *q.v.*

*cartilago meckeli* (plural *cartilagines meckeli*) = Meckel's cartilage (the functional lower jaw of Elasmobranchii and Holocephali, the embryonic lower jaw of other gnathostomous vertebrates which ossifies at least in part as the mentomeckelian, mediomeckelian, coronomeckelian, articular and retroarticular. It remains in some adult fishes as a pointed rod embedded in the

dentary and angular. Also called mandibular cartilage, ceratomandibular cartilage or primary mandible. See also Bridge's ossicles).

cartilago pharyngobranchialis (plural cartilagines pharyngobranchiales) = pharyngobranchial (the deep, endochondral bone at the top of the gill arch. May bear the upper pharyngeal and a dentigerous plate. May occur on arches 1, 2, 3, 4. Also called super-pharyngeals or superior pharyngeals. Suprapharyngobranchials are never associated with teeth while infrapharyngobranchials may be associated with dermal plates bearing teeth).

cartilago scapularis (plural cartilagines scapulares) = scapular cartilage (a rod-shaped cartilage forming the lateral part of the coracoscapular bar in Elasmobranchii, articulating ventrally with the coracoid cartilage and dorsally with the suprascapular. The pectoral fin attaches laterally to its glenoid cavity).

caruncle = a fleshy superficial outgrowth or knob. The modified dorsal fin rays in Ceratiidae are called caruncles.

carver = a person who slices open the belly of a cod before passing it to the splitter (*q.v.*) (Newfoundland).

cascade = 1) a short, steep drop in a stream bed often marked by boulders and white water; a small waterfall or one section of a broken waterfall. Usually less than a metre high.

cascade = 2) a tiered structure used in aerating and degassing water for aquaculture.

case = a problem in zoological nomenclature referred to the International Commission on Zoological Nomenclature for a decision. The problem is published in the Bulletin of Zoological Nomenclature as are comments by others, and is voted on by members of the Commission and their decision is published as an Opinion.

case ending = the inflectional form of nouns and adjectives in Latin grammar used in scientific names, the ending varying according to the declension. The nominative or substantive and the genitive or possessive are the declensions used.

case fatality rate = the number of deaths from a disease in every hundred cases. See also mortality rate.

case hardening = leather-like hardening of fish skin when fish are dried too quickly, rendering the fish unsuitable for sale.

casey = cassie.

cashmarie = a person who carried and sold fish, usually at inland markets (Scottish dialect, from the French *chasse-marée*).

casie = cassie.

cask = a wooden, cylindrical vessel used for shipping fish such as dried and salted cod from Newfoundland. Such a cask contained 4 cwt (hundredweight, 1 cwt being 50.802 kg (long), 45.359 kg (short)).

cask fish = the fish shipped in a cask, e.g. cod from Newfoundland.

casque-like = shaped like a helmet.

cassen = of meat or fish, spoilt or worthless.

cassie = a straw or rush woven basket for carrying fish. Also casey, casie, caisy, caisie, caysie, cazzie, caiss, kazie, kazzie, kazy, kaisie, keizie and keize.

cast = 1) the result of casting.

cast = 2) the terminal strand of a handline to which hooks are attached by short droppers.

cast = 3) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

cast = 4) to throw a net, e.g. a castnet.

cast = 5) a handful of herrings, usually three fish, used in counting the catch.

cast = 6) of fish, to spawn.

cast = 7) to discharge a catch or a season's catch at a fishing station.

cast-net = castnet.

caster = 1) the chrysalis or pupa form of the maggot used as bait in angling in Europe.

caster = 2) one who practices casting.

casting = 1) the act of delivering a lure or bait into the water using a fishing rod and line.

casting = 2) to throw a sounding lead or other object into the water.

casting arc = the path that a fly rod follows when in use; usually related to a clock face to indicate the position.

casting net = castnet.

casting sinker = bell sinker (a weight or sinker shaped like a bell).

casting the mell = allotting poke net (*q.v.*) fishing rights near the town of Annan on the Solway shore, Scotland. Local fishermen piled up sand heaps on the shore, and then turned away while a neutral observer kicked over one of the piles. The builder of this pile had the first choice of a fishing section. After him, alternate pile builders had a choice of remaining sections. Formerly,

the neutral observer through a heavy hammer (or mell) into the circle of sand piles with the pile nearest where the hammer landed getting the first choice.

casting weight = the optimum weight that a fishing rod casts, determined by trying various lead weights until the rod feels sluggish. Usually marked above the butt in ounces or grams.

castnet = a method of catching fish in shallow waters by throwing a circular net over them; the net opens in the air to a diameter of about 2 metres and sinks rapidly because of weights attached to its margin. The rim of the net has a draw rope that enables it to be closed. A Newfoundland fisherman could catch 100 lbs (45.5 kg) of capelin in one throw. Also called throw net or trow net.

castnet ball = a lead sinker around the margin of the net.

castnet mould = a hollow form in which lead balls are cast for use as weights in the net (Newfoundland).

cat's paw = a knot used in angling to attach a swivel. A loop is passed through the eye of the swivel and the swivel rotated vertically through the loop three times. Various websites have animated steps showing how to tie this knot.

cata- (prefix) = down, against.

catadromous = running down; those fishes which spend most of their lives in freshwater and which migrate to the sea to reproduce, e.g. *Anguilla* (Myers, 1949; McDowall, 1968).

catalog = see catalogue.

catalogue = 1) a list of materials in a collection in the form of a book or electronic, detailing fish species, collection locality, number of specimens, date of collection, identifier, etc.

catalogue = 2) the process of making a catalogue.

catalogue = 3) a compilation of taxonomic literature within a list of species.

catalogue number = usually all specimens caught at one place and one time are given the same catalogue number. Some museum catalogue numbers use the same number as the accession number. The numbers take various forms, e.g. a series of numbers or a year followed by a number, and each number is preceded by the acronym of the museum in systematic papers.

catapult = used by European anglers to project ground bait or loose feed into the water with accuracy in order to attract fish to an area where the baited hook is fished.

cataract = waterfall, a very steep fall in a watercourse.

catastrophic drift = the massive displacement of organism caused by flooding or pollution.

catazygalia = zygalia (four small cranial bones in Osteolepiformes, perhaps formed from elements of the second to the fourth vertebra, a segment of the primordial cranium. The

anazygalia are located dorsal to the chorda dorsalis, the catazygalia ventral to the chorda dorsalis).

catch = 1) the act of landing a fish dead or alive or of bringing fish on board a vessel. Live catches may be released or retained.

catch = 2) the number or weight of fish caught by a fishery, by fishing gear or by angling. May be the total amount caught, only the amount landed, or not kept but released. Usually expressed in terms of wet weight.

catch = 3) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

catch = 4) ketch (a boat used for fishing and coast work).

catch ceiling = a specific limit placed on the harvest of any given fish species or stock; a quota.

catch composition = the fish species, age, size, numbers, etc. in a catch.

catch control = a measures applied to catches used by managers to regulate fishing.

catch curve = plot of the natural logarithms of the number of fish in various age groups ( $N_t$ ) against their corresponding age ( $t$ ). Often used to estimate total mortality from the descending limb of the curve; shows the decrease in numbers of fish caught as the fish become older and less numerous or available.

catch limit = the number of fish allowed to be caught and kept in one day by an angler, cf. possession limit.

catch out = to deplete the stock of fish in a body of water or in a population. See also fish out.

catch per unit effort = an older term for the catch in numbers or weight taken for a given amount of fishing effort over time using specific gear, expressed as a ratio. Often considered an index of fish biomass or abundance - a decline in CPUE usually indicates a decline in the stock. May be used as a measure of economic efficiency of fishing. Also called fishing success, availability, catch per effort. Abbreviated as C/E, CPUE. The more recent form is catch/effort (C/f or Y/f) where C is catch in numbers, Y is catch in weight, taken by a defined unit of fishing effort, f.

catch, photograph, release = a management tool for preserving angling stocks. Abbreviated as CPR.

catch quota = the maximum catch permitted for a group of fishers, vessel, a fleet or a country from a stock. The quota is set to manage the fishery.

catch rate = the time spent to catch fish expressed as catch in numbers or kilogrammes per unit of effort. Also called harvest rate.

catch share = individual transferable quota (a fixed share of the catch assigned to each fisherman or vessel owner as a tradable right, one that can be sold or leased to others. This may make an operation more efficient as some fishers buy the quotas of others and fleets can be reduced or rationalised with less government interference. As above, results are mixed as wealthier fishers benefit and the owner-operator system is disadvantaged. Abbreviated as ITQ).

catch stream = the catch statistics for a kind or stock of fish over a period of time.

catch-all = anything which contains unmatched or unrelated items; used for a genus with species thought to be unrelated but whose relationships remain to be determined.

catch-and-release = angling where the fish are released to preserve stocks. Also called non-retention, closed to retention and daily limit zero.

catch-at-age = the estimated number of fish caught, tabulated by fish age and year of capture, and by other factors such as gear or nation. Catch-at-age may be estimated on the basis of catch-at-size, using age-length keys or cohort slicing.

catch-at-length = catch-at-size.

catch-at-size = the estimated number of fish caught, tabulated by size class and by other factors such as gear or nation. For any given species, catch-at-size should include all fish killed by the act of fishing, not just those fish that are landed.

catch-at-weight = the estimated weight of fish caught, tabulated by weight class and by other factors such as gear or nation. For any given species, catch-at-weight should include all fish killed by the act of fishing, not just those fish that are landed.

catch-up growth = a form of compensatory growth where underfed or malnourished fish are returned to adequate feeding conditions.

catchability = the extent to which a stock is susceptible to fishing, the part of a stock that is caught over a defined unit of time or fishing effort; quantitatively, the proportion of the stock removed by a defined unit of fishing effort. In pelagic fishes, an inverse function of stock biomass. When it is 0.01 or less it can be used as an instantaneous rate in measuring population change (Ricker, 1975). In fisheries models, the factor ( $q$ ) relating abundance to stock size ( $x = q \cdot N$ ) and fishing mortality to fishing effort ( $F = qf$ ). Also called catchability coefficient, force of fishing mortality. Abbreviated as  $q$  or  $q_f$ .

catchability coefficient = force of fishing mortality (the extent to which a stock is susceptible to fishing; quantitatively, the proportion of the stock removed by a defined unit of fishing effort. In pelagic fishes, an inverse function of stock biomass. When it is 0.01 or less it can be used as an instantaneous rate in measuring population change. Also called catchability).

catchability-led stock collapse = the tendency for small schools of fish to aggregate into larger schools, resulting in a continued high fishing pressure although the total stock has declined. Also called hyperaggregation.

catcher vessel = a fishing vessel that delivers its catch to a mother ship, to shore plants or to catcher-processors.

catch-out pond = a pond stocked with fish for fee-paying anglers to catch.

catch-the-salmon = a game in which two boys take the ends of a piece of rope and chase a third boy until they wrap the rope around him, then pulling him to and fro (British dialect).

catcher-processor = a fishing vessel that both catches fish and processes them, enabling a higher grade of product to be produced at on shore facilities, e.g. a trawler, 100-375 feet long.

catching efficiency = a measure used to compare the catching ability of fishing gear.

catchment = 1) the collecting of water, especially rainfall.

catchment = 2) a reservoir or other basin for catching water.

catchment = 3) the water caught in a reservoir or basin.

catchment = 4) watershed (strictly an elevated boundary area separating tributaries draining to different river systems; often used in American usage to mean a drainage basin, i.e. the area which supplies water by surface and subsurface flow from precipitation to a given exit point. Catchment area is more exact).

catchment area = the area drained by a river or body of water or the area draining into a body of water.

catchment basin = the entire area from which drainage is received by a river or a lake; most generally used in reference to surface runoff.

category = a group or level within a hierarchical classification, the main ones being kingdom, phylum, class, order, family, genus and species. Note - not a taxon (*q.v.*).

catfish = a member of the Order Siluriformes with over 2870 species worldwide in fresh waters with some families primarily marine. Named for their barbels or "whiskers" likened to those of cats.

catfish ball = a mass of juvenile catfish, such as *Ameiurus nebulosus*, that schools, presumably as protection from predators.

catfish death = suicide by drowning (slang).

catfish virus disease = channel catfish disease.

caudad = towards the tail, posteriorly, caudally.

caudal = 1) referring to or concerning the tail.

caudal = 2) towards the tail, although caudad is preferred.

caudal artery = the extension of the dorsal aorta in the tail.

caudal bony plate = any ossified plate helping to support the tail fin. A name given to the first larger pair of uroneurals, situated on the curve of the upturned posterior end of the vertebral column. Preferably called first uroneural.

caudal filament = a thin, flexible, filamentous extension of the caudal fin tip of Chimaeridae.

caudal fin = the tail fin, aiding movement. Also called the uropterygium. The fin at the posterior end of the vertebral column (but in Centriscidae the hind end of the body rotates so that the caudal fin is ventral, and in some Trachipteridae the upper lobe of the caudal may be dorsal (the separate lower lobe may disappear). In other families, such as the Zoarcidae and Anguillidae, dorsal, caudal and anal fins are united and are externally indistinguishable. Abbreviated as C.

caudal fin ray count = usually only the principal or main rays are counted, the tiny rudimentary, often procurent rays are not included. In fishes with branched rays, the principal count is the number of branched rays plus two. These rays are usually markedly larger than the neighbouring ones and originate from the hypural plate. In some fishes there is a gradation in size and all rays are counted (e.g. in Ictaluridae). The count may be expressed in a formula such as iiil7-8liii. The small Roman numerals here represent rudimentary rays, large Roman numerals the unbranched principal rays, and the Arabic numerals the branched principal rays.

caudal flexure = the fold formed at the end of the caudal peduncle when the caudal fin is flexed to determine the position of the posterior edge of the hypural plates. This posterior edge is often difficult to determine as a point for measurement for standard length in fleshy or large fishes; some dissection may be required.

caudal gland = the glandular masses on the caudal peduncle and fin of mature males in the characoid subfamily Glandulocaudinae. The multicellular gland is associated with an enlarged modified scale which overlies the gland on each side. The gland may produce a chemical to attract females.

caudal neurosecretory gland = an area of the spinal cord dorsal to the most posterior vertebrae, e.g. in *Ictalurus punctatus*. This concentration of neurosecretory or Dahlgren cells is of unknown function but is probably involved in osmoregulation or ion balance and possibly in reproduction.

caudal pad = a tongue-shaped posteriorly-directed appendage behind the seminal receptacle in female Holocephali.

caudal peduncle = the wrist-like portion of the posterior part of the body between the end of the anal fin and the base of the caudal fin. Its length is measured between the insertion of the anal fin and the caudal flexure (the fold shown by the hind edge of the hypural plates when the caudal fin is flexed). Depth is measured vertically at the narrowest point. Called tail wrist in angling.

caudal peduncle scale count = includes all the longitudinal scale rows around the circumference of the peduncle at its narrowest point.

caudal photophore = old name for the Prc photophores.

caudal pit = the notch in the dorsal or ventral profile of the caudal peduncle just before the caudal fin in certain sharks.

caudal scale = a modified terminal scale of the pored lateral line series found towards the medial base of the caudal fin in some Characidae, e.g. *Landonia latidens*). In some species it supports the caudal pouch.

caudal skeleton = the urophore, formed from various bones of cartilaginous or dermal origins.

caudal vein = a vein in the tail that returns blood from the trunk and tail to the heart. It leads directly into the axial vein in the posterior trunk.

caudal vertebra = one of the posterior vertebrae lacking ribs, found behind the abdominal vertebrae and extending to the tail, each with a ventral haemal arch, canal and spine. The first caudal vertebrae is near the internal, dorsal tip of the first anal proximal pterygiophore. Note that there are some transitional vertebrae with a rib or reduced remnant of a rib and a haemal arch or an incomplete haemal arch.

caudally = in the direction of the tail; caudad.

cauler = caller.

cauliflower disease = a mildly-infectious viral disease (*Lymphocystis*) of eels and higher aquarium fishes (not cyprinids and catfishes) causing enlarged cells forming lesions on the jaws, and also on fins and skin. The papillomatous lesions can coalesce to form a cauliflower shape. May be pinkish or red when having a vascular supply or grey-brown to black when melanocytes are present. There is no known treatment and the lesions eventually disappear. Also called lymphocystis disease.

causeway = a raised road over wet ground or shallow water.

cave fish = fishes living in subterranean waters including artesian wells. Not necessarily a true cave.

caveached fish = fish cut into pieces, fried in oil, laid in a large earthenware container and pickled in vinegar, salt, spices, onions, etc. (West Indies).

cavernarius = cavernicolous.

cavernicole = an inhabitant of caves.

cavernicolous = living in caves.

cavernous = containing cavities, e.g. the superficial bones of the head in some species of Sciaenidae. The cavities may be empty or filled with mucus.

cavernous tissue = spongy white tissue embedded in the skin near the anus in most, and near the anal fin in some, Cetomimidae.

cavernosus = cavernous.

caviar = 1) the prepared and salted roe of sturgeons (*Acipenser*, *Huso*), or broadly construed, the similarly treated roe of other fishes such as Salmonidae and Cyclopteridae. Only salted sturgeon eggs can be labeled caviar in the U.S.A. The eggs are separated from surrounding tissues, sometimes washed in white wine or vinegar, and pickled with salt or borax, or packed fresh or unsalted and highly perishable. خاگ آور or khāgāvar is Farsi (Persian) for roe-generator.

Caviar = 2) a small nineteenth century city in New Jersey on Delaware Bay, processing sturgeon and caviar for New York. See also Ikranoye.

caviar fish = a common name for Acipenseridae, especially those species producing caviar.

caviar substitute = fish roe prepared like true caviar from lumpfishes (Cyclopteridae), cods, carps, mullets, capelin, salmonids; sometimes dyed and usually with a salt content over 6%.

caviare = caviar.

caviare to the general = a Shakespeare quote meaning not to everyone's taste or appealing only to a highly cultivated taste (Hamlet, Act 2 Scene 2 - general being the general public).

cavil = 1) to extract a hook from a fish mouth by means of a notched stick (Scottish dialect). Also spelled kavle and variants.

cavil = 2) kavle (the rearmost space in a boat where the fishing line is hauled in over the gunwhale and where fish are removed from the hooks. Also spelled kavl, kavel, kavvel, kavvle)).

cavity brooder = a fish that lays its eggs in a cavity, cave or other concealment; the eggs are aggressively guarded by the parents, e.g. in the Cichlidae *Aristogramma*, *Julidochromis*, *Neolamprologus*, and *Pelvicachromis*.

cawf = an eel box (archaic).

cawl = caal.

cawler = caller.

cawmril = cameral.

cay = key (a small, low island near the mainland composed mostly of sand and/or coral. Also spelled kay).

caysie = cassie.

cazzie = cassie.

Ce = photophore at the upper end of the gill cover where it meets the lateral line in Myctophidae.

CE = common era, a non-religious way of expressing years in the calendar based on the years of the Christian era. Note there is no year 0 so the year before 1 CE (or 1 A.D.) is 1BCE (or 1 B.C.).

CE = equilibrium catch (the catch (in numbers) taken from a fish stock when it is in equilibrium with fishing of a given intensity, and (apart from the effects of environmental variation) its abundance does not change from one year to the next (Ricker, 1975). Also called sustainable yield, equilibrium yield).

$C_E$  = CE.

cebiche = ceviche.

Cecil's fast = William Cecil passed legislation in the reign of Queen Elizabeth I requiring fish, not meat, to be eaten on certain days of the week; hence fish dinners are called this.

cecum = a pocket or blind pouch; caecum.

cedar water = blackwater in the eastern U.S.A. in the Pine Barrens and nearby eastern coastal plain (very soft water, rich in humic acids and poor in nutrients with minimal transparency. pH is around 3.5-4.8 and colour is stained by tannins). Also found in tropical areas where it supports a distinct fish fauna.

*cedis incertae* = *incertae cedis* (of uncertain seat, meaning of uncertain taxonomic position or affinities).

Celsius = a measure of temperature on a metric scale used world-wide and by scientists. Abbreviated as C. In North America and in older literature Fahrenheit is used. The conversion is  $^{\circ}\text{F} = (^{\circ}\text{C} \times 9/5) + 32$  and  $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$ . Usually presented as  $^{\circ}\text{C}$  or  $^{\circ}\text{F}$  but strictly  $3^{\circ}\text{C}$  is an actual temperature while  $3\text{C}^{\circ}$  is a range of three degrees.

cement gland or organ = adhesive organ (transient larval organs near the mouth used to attach the larvae to the substrate, e.g. in *Protopterus*, *Lepidosiren*, *Acipenser*, *Esox*, *Macropodus*).

cenote = a flooded depression caused by a collapse in a limestone area (Yucatán, Mexico).

Cenozoic = a geological era, the age of mammals, ca. 65-0 million years ago, comprising the Quaternary and Tertiary.

census = an inventory; in fisheries assessment surveys, a census is used to provide the comprehensive basis for analysis and classification of the fisheries systems and, consequently, the basis for statistically representative sampling programmes.

centauri knot = a knot used by anglers to attach hooks through the eye to the line. It is made with a minimum of friction and so does not distort the line, being useful then across a wide range of line diameters. Various websites have animated steps showing how to tie this knot.

centi- (prefix) = hundredth (1/100); one hundred (100).

Centigrade = see Celsius.

centner = 1) 50 kg in the English version of the German zentner.

centner = 2) 100 kg in Russia.

centra = plural of centrum.

central canal = the fluid-filled narrow cavity in the spinal chord.

central nervous system = the brain and spinal chord. Abbreviated as CNS.

centre-console boat = a fishing boat with the control station at the boat's centre allowing all the deck around the edge of the boat to be used for fishing.

centrepin reel = an angling reel with the line wound directly on to a revolving drum. casting distance is limited but this is offset by good tackle control when trotting or fighting fish.

centrum (plural centra) = the central body of each vertebra.

centrum tendineum = the large aponeurosis (flattened tendon) at the bend of the bilocular muscular stomach, e.g. in Mormyridae.

cephalic = pertaining to the head.

cephalic clasper = a mace-like spiny-headed rod found on the mid-dorsal surface of heads of male Holocephali. Thought to aid in holding the female during copulation.

cephalic fin = the thick flap-like fleshy appendage projecting from the pectoral fins lateral to the mouth of Mobulidae.

cephalic flipper = the thick flap-like fleshy appendage projecting from the pectoral fins lateral to the mouth of Mobulidae.

cephalic index = the length of the head as a ratio of total or standard length.

cephalic lateral line (or cephalic sensory canals) = the head canals opening to the surface in pores and containing neuromasts (sometimes the canals are lost and the neuromasts are exposed). Similar to the trunk lateral line in structure and function but having different innervation. The following canals may be present: supratemporal (abbreviated ST) running across the top of the head connecting the lateral branch of each side; the opercular (OP), an isolated canal on the anterior operculum; supraorbital (SO) above the eye and extending anteriorly to the nostrils; infraorbital (IO) below the eye and above the upper lip; preoperculo-

mandibular (PM) along the preopercle and lower jaw. The pores on the lower jaw are sometimes referred to separately as mandibular pores. Individual pores are sometimes referred to separately by the name of the structure to which they are adjacent:- nasal, postmaxillary, interorbital, etc. The coronal pore is the median dorsal pore (COR) between the eyes formed by junction of branches from each supraorbital canal.

cephalic pit = pore-like structures on the gill covers of snakeheads (Channidae).

cephalic ray = one of the dorsal fin rays on the head behind the illicium.

cephalic spine = one of the spines, probably denticle derivatives, occurring singly or in pairs just behind the orbit on the cheek area in some fossil sharks. May have occurred only in males and may have served to hold the female during copulation, e.g. in the Jurassic genera *Hybodus*, *Asteracanthus* and *Acrodus*.

cephalic spongy sensory area = the area above and behind the eye penetrated by numerous branches and pores of the cephalic lateral line system. Known in *Brevoortia* (Clupeidae).

cephalic tenaculum = cephalic clasper (a supplemental clasper in Holocephali, on the forehead).

cephalic vesicle = the blister-like inflation over the head of larvae of some species of Gadidae.

cephalofoil = the lateral extensions of the head in hammerhead sharks.

ceramic fish = swanky, in reference to a gift or some new purchase (slang). Derived from the TV show *Wheel of Fortune* where, in the earlier transmissions, contestants had to purchase prizes from their winnings and left over amounts, after more valuable items were bought, purchased ceramic fish and similar cheap items.

ceratal = referring to the ventralmost elements of the gill arch, i.e. ceratbranchials, ceratohyal and Meckel's cartilage. Compare epal.

ceratobranchial = a long, deep, endochondral bone in the middle portion of the gill arches between the epibranchials and the hypobranchials. There are usually 5 pairs of ceratobranchials, absent in some Anguillidae, *Polypterus* and *Calamoichthys*. The fifth pair of ceratobranchials are modified in Cypriniformes and Siluriformes into a strong, tooth-bearing bone called the inferior pharyngobranchial bone. Sometimes spelled keratobranchial.

ceratohyal = the endochondral bone articulating dorsally with the interhyal, anteriorly supporting some branchiostegal rays and ventrally joining one or two hypohyals. The ceratohyal and the epihyal are two ossification centres of the same bone and should therefore be named ventral ceratohyal and dorsal ceratohyal respectively. Since the ventral ceratohyal is probably homologous with a hypobranchial, the correct names should be anterohyal and posterohyal, while the two hypohyals should be called dorsohyal and ventrohyal. In cartilaginous fishes it is a paired element on the ventral part of the hyoid arch.

ceratomandibular cartilage = Meckel's cartilage (the functional lower jaw of Elasmobranchii and Holocephali, the embryonic lower jaw of other gnathostomous vertebrates which ossifies at least in part as the mentomeckelian, mediomeckelian, coronomeckelian, articular and

retroarticular. It remains in some adult fishes as a pointed rod embedded in the dentary and angular. Also called mandibular cartilage or primary mandible. See also Bridge's ossicles).

ceratotrich = ceratotrichium.

ceratotrichia = plural of ceratotrichium.

ceratotrichium (plural ceratotrichia) = a long, horny or keratinous, non-cellular, cylindrical, flexible and non-segmented ray which supports the fins of Elasmobranchii and arthrodires. They may replace fin radials or be a third element in fin support in a series basals, radials, ceratotrichia. Used to make shark fin soup. Bony, unsegmented, unbranched rays superficially resembling ceratotrichia of Elasmobranchii are found in the fin membranes of Acanthodii.

cerci = plural of cercus.

cercus = tail filament, e.g. in *Scaphirhynchus* and *Pseudoscaphirhynchus* (Acipenseridae) where the tail ends in a thin core of cartilage sheathed by small scales. More commonly used for the paired appendages at the rear of arthropods.

cerebellum = a thick-walled dorsal swelling of the dorsal metencephalon (anterior hindbrain and perhaps including the posterior midbrain) concerned with locomotory activity. This unpaired structure is found just posterior to the optic lobes, has rounded lateral enlargements which project partially into the fourth ventricle and its posterior end projects dorsally above the fourth ventricle.

ceremonial harvest = a harvest of fish by natives for ceremonies and to support traditional lifestyles. Also called subsistence harvest.

ceroid = yellow-brown pigments of fish, found particularly in the liver and spleen, as end products of peroxidation of unsaturated fatty acids.

cervical = 1) pertaining to the neck (most fish have no neck).

cervical = 2) extrascapula (a small bone bordering the posterior margin of the skull roof in primitive Teleostomi. It apparently originates from enlarged scales. One of a series of from 2-8 bones known variously as nuchals, postparietals, scale bones, supratemporals or tabulars).

cervical notch = a depression where the head and body meet.

cervical photophore = a light organ in Myctophidae located at the upper corner of the gill cover where it meets the lateral line. Abbreviated Ce.

cervical sinus = cervical notch.

cervical vertebra = one of the anterior vertebrae in sharks.

ceviche = raw white fish marinated in lemon or lime juice and served with sweet limes, avocados, onion rings, garlic, cilantro, chillies, boiled corn and tomatoes. Originally from Peru, variously modified. Also called fish cocktail and spelled cebiche and seviche.

*cf.* = *confer*, meaning compare (with). Used with scientific names to indicate a similarity to the named species without certain identification; a provisional identification due to a damaged specimen or other problems.

*cfr.* = *confer*.

cfs-day = the volume of water represented by a flow of 1 cubic foot per second for 24 hours (equals 86,400 cubic feet, 1.983471 acre-feet or 646,317 gallons).

c fsm (cubic feet per second per square mile) = the average number of cubic feet of water per second flowing from each square mile of area drained by a stream, assuming that the runoff is distributed uniformly in time and area.

chafer = chafing gear.

chafing gear = any materials attached to wear points on nets. See also top-side chafer.

chafing hair = elongate plastic chafing gear.

chain bracket = a chain used on an otter board in place of a bracket. Also called angle iron chain, back board chain, board chain, chain triangle, towing chain.

chain mat = a device used in front of a trawl to disturb fish and cause them to be caught by the following trawl net. An interlinked network of lateral and longitudinal tickler chains, *q.v.* Also called a chain matrix.

chain matrix = chain mat.

chain off = moving the warps (*q.v.*) from their normal position above the stern down into the stern ramp of a trawler for shooting away and then back up again as the net is hauled back. Used on boats without hydraulic ice davits.

chain triangle = chain bracket.

chain-of-lakes = a series of lakes connected by streams.

chalky fish = an abnormal chalky-white appearance and a watery texture associated with a rapid drop in pH after capture, e.g. in halibut.

change, mandatory = a change in spelling of a name required by the International Code of Zoological Nomenclature.

change of rank = when a name is moved from one level of a classification system to another, e.g. from subspecies to species.

channel = 1) an area that contains continuously or periodically flowing water that is confined by banks and a stream bed. May be natural or artificial.

channel = 2) a narrow stretch of water between adjacent land masses.

channel = 3) a large strait, e.g. English Channel.

channel = 4) a lead in ice.

channel catfish disease = a disease of fry and fingerlings of channel catfish (*Ictalurus punctatus*) and other Ictaluridae caused by a herpesvirus affecting internal organs. Occurs when water temperatures rise to 25-30°C. Mortality is very high and survivors are carriers for life. Lowering water temperatures below 19°C reduces mortality. Fish show loss of equilibrium, spiral swimming and tend to hang vertically in the water. Haemorrhages of the skin and gills occur along with abdominal swelling.

channel dam = lowhead dam (a dam extending across a river of low height, usually 15 feet (about 5 metres) or less. It impounds the water behind it, has minimal effects on the downstream regime and allows water to fall over its whole width. Quite dangerous as boaters and swimmers may not see it until too late and can be caught in the backwash beneath the dam. Also called run-of-the-river dam).

channel plate = a u-shaped, steel bracing bar on the back of an otter board, *q.v.* Also called back bar and back channel.

channelisation = the process of changing, deepening and straightening the natural path of a waterway.

char = members of the genus *Salvelinus* of the family Salmonidae with about 20 northern hemisphere species. Important food and game fishes of marine and fresh waters. The name is from the Gaelic ceara meaning red or blood-coloured or possibly from the Old English for turner, a fish that swims to and fro. See also charr and charr. The variant number of "r"'s on the end of the name is attributed to a rivalry between the late nineteenth century scientists Albert Günther, who used charr, and Francis Day, who used char.

char dish = a Delftware pottery made to hold char (*Salvelinus alpinus*) preserved in spices. The char came from Lake Windermere in northwest England and the pots were made in Liverpool during the eighteenth century. They measured 2.5-4.0 cm deep by 15-25 cm wide and were often decorated with painted fish.

character = a variable structure or feature of a species or taxon that enables it to be distinguished from another species or taxon. Used in description and identification of species.

character displacement = forced evolution of dissimilar characters in related species where their ranges overlap. Species differ more where they occur together than when their distribution does not overlap. Usually this is detected as morphological features related to resource exploitation.

character polarity = the inferred direction of change of a characters state in a phylogenetic tree. The direction is determined by reference to the character state in an outgroup.

character release = two closely related species become more alike in regions where their ranges do not overlap than in regions where they do. Opposite of character displacement.

character state = the condition of character, e.g. scales present or scales absent, where scales is the character and present and absent are states.

characteristic = often used as synonym of character, strictly it is the distinctive state or expression of that character.

characteristic species = indicator species ((1) a fish species whose status provides information on the overall condition of the ecosystem and of other species in that ecosystem; fish that are sensitive to environmental conditions and which can therefore be used to assess environmental quality).

chardonnay = a mutated strain of zebrafish involving white blood cells, named for the wine. Other mutants are shiarz and chardonnay. These zebrafish (*Danio rerio*) are used in studies of haemoglobin formation as their inner body parts are easily seen in these small and transparent fishes and their genome has been sequenced.

Chargoggagoggmanchauggagoggchaubunagungamaugg = the Algonquin name of a lake in Webster, Massachusetts, incorrectly said to mean "you fish your side of the water, I fish my side of the water, nobody fishes the middle". Really means "Englishmen at Manchaug at the Fishing Place at the Boundary". Longest place name in the United States.

charismatic megafauna = a large charismatic species, e.g. presumably a great white shark in fishes.

charismatic species = any species that has popular appeal and is used to focus attention on conservation campaigns.

[Charlie the Tuna](#) = a cartoon tuna, used as the mascot for the product StarKist tuna from the early 1960s. Charlie had a beret and glasses, believed he had good taste and so was just right for the StarKist company. He was always rejected because the company was looking for tuna that tastes good. The rejection came in the form of a note attached to a hook saying "Sorry, Charlie", which became an American catchphrase (pun unintentional).

charr = char.

charr = alleged Scottish pronunciation of char.

chart datum = a referenced surface from which soundings or tide heights are calculated, e.g. a tidal datum is the lowest a tide will ever reach (very rarely lower tides are found).

charter boat = a boat available for hire by anglers over a short time period. Usually crewed and with gear and bait supplied.

chase spawner = fish in which the male chases the female during spawning, e.g. *Carassius auratus*.

chaud = a dish in which a cod's liver is an ingredient (Shetland Isles dialect).

chauter = chowter.

cheapskate = a miser, a stingy person, unwilling to spend money (nothing to do with skates (Rajiidae); of uncertain origin).

cheater = said of small fish that steal bait meant for larger fish. Sometimes spelled cheeter.

cheater hook = an extra hook added to a single-hook lure. Also called trailing hook.

cheater line = an extra length of line attached to the main line in angling for carrying another lure or hook.

chebacco boat = a fishing vessel employed in the Newfoundland fisheries. The word may be a corruption of Chedabucto, a bay in Nova Scotia, from which vessels are fitted out for fishing or the same as the chebec. Also called pinksterns.

chebec = xebec (a small, three-masted vessel used by Mediterranean pirates and still used in commerce to a limited extent. From the Arabic shabbak. Also spelled zebec).

check = a mark or discontinuity on a scale or other hard structure used for aging, caused by cessation of growth and absorption of deposited material due to spawning (hence a spawning check), injury, disease, parasites, or unseasonal lack of food. Also called split.

check dam = a small dam constructed in a small water course to decrease the streamflow velocity, minimize channel erosion, promote deposition of sediment and to divert water from a channel.

checklist = a list of species arranged in simple format for convenience of use, sometimes annotated with life history notes or other information.

cheek = the area between the eye and the preopercle.

cheek height = the least distance from the orbit to the lower edge of the horizontal arm of the preopercle.

cheek scale count = the number of scales crossing a straight line from the eye to the corner of the preopercle.

cheeks = muscles from the cheek area of a fish sold as a delicacy, e.g. cod cheeks, pickerel (*Sander vitreus*) cheeks.

cheese = a wooden disk placed on a pile of stiff and dry salt cod in a barrel before the fish-screw, q.v., was applied to pack it tightly. Named for its resemblance to a cheese wheel.

cheeter =cheater.

cheironym = an unpublished scientific name; manuscript name.

cheirotype = a type specimen of a species designated by a manuscript name.

chelation = a method of binding or locking up metal ions, used in water treatment in aquaria.

chemical etching = use of acids, bases or other chemicals in making fishing hooks that gives a very sharp point.

chemical filtration = a cleaning process for aquarium water where filters use chemical processes, e.g. protein skimmers and any filter containing chemical media such as activated carbon, molecular adsorption pads, zeolite, peat or resins.

chemocline = a sharp gradient in chemical concentration, e.g. the transition zone between layers in a meromictic lake, *q.v.*

chemoreception = the ability to sense chemicals in the environment, e.g. sharks and blood.

chemoreceptor = the receptors for chemoreception, e.g. taste buds on barbels, skin and in the mouth.

chemosensory = relating to taste and smell operating on chemicals, dissolved in water in the case of fish.

chemotropic = turning towards a chemical stimulus.

chemotype = chemically characterised portions of morphologically indistinguishable populations.

cherry bomb = a form of small explosive formerly used by purse seiners in California to frighten and concentrate a fish school.

chest = 1) the anterior ventral surface of a fish, just behind the head; may include the lower jaws and the chin.

chest = 2) a wicker box trap used to catch salmon (Scottish dialect).

chest waders = waterproof boots extending to the chest used by anglers and scientists when fishing. Made of latex, neoprene, Gortex, etc.

chevron = 1) a V-shaped scale found along the edge of the abdomen of clupeids, often providing the belly with a sharp, serrated edge.

chevron = 2) the earliest developmental form of myomeres in larvae where the angle is formed by the epaxial and hypaxial muscle masses.

chhandi jal = a drift gill net used for catching *Hilsa ilisha* (Clupeidae) in India.

chianti = a mutated strain of zebrafish lacking haemoglobin, named for the wine. Other mutants are shiraz and chardonnay. These zebrafish (*Danio rerio*) are used in studies of haemoglobin formation as their inner body parts are easily seen in these small and transparent fishes and their genome has been sequenced.

chiasma = the crossing of the fibres of the optic nerve.

chicken haddie = a commercial term for canned haddock, cod, cusk or hake or any combination thereof, that has not been ground. No chickens involved.

chicken of the sea = 1) originally albacore, yellowfin tuna and skipjack tuna canned in oil.

chicken of the sea = 2) a commercial brand name for fish and other marine products and used as a term for any marine food that is light and tasty.

chicken of the sea = 3) angler slang for a seagull.

chiddles = chitlings.

chidlins = chitlings.

chikuwa = a variety of Japanese fish paste cake; kneaded flesh wrapped around a stick and then baked.

chilile = inshore lake bottom.

chill storage = storage of fish at or just above 0°C as a means of preventing spoilage.

chilled fish = fish stored near freezing but not frozen.

chilled water stowage = storing commercial fish in chilled fresh or salt water using ice or mechanical refrigeration. Limited to about 3-4 days as some fish take up water and salt, their eyes become cloudy and gills are bleached as blood is lost.

chiller = 1) a device for cooling water in aquaria.

chiller = 2) choller.

chimaera = 1) an organism having tissues of two or more genetic types. Results from mutation or abnormal chromosome segregation.

chimaera = 2) members of the Order Chimaeriformes which has about 33 species in marine waters world-wide. Anatomical characters are a mix of those found in bony fishes and cartilaginous fishes, leading to the name (the mythical Greek monster had a lion's head, a goat's body and a serpent's tail).

chimaera poisoning = poisoning resulting from eating the flesh or viscera of ratfishes. The oviducts of *Hydrolagus* are toxic to mice. The flesh of chimaeras is reputed to have a stupefying effect.

chimneyfish = someone who smokes and drinks a lot, often simultaneously (slang).

chin = the tip of the lower jaw or the area between the rami of the lower jaw.

chin appendix = Schnauzenorgan (a German word for the chin protuberance of elephant nose fishes (Mormyridae), where there is the highest density of electrical receptors).

chin crest = an outgrowth of the dentary bone of the lower jaw. The crests from each side of the lower jaws converge anteriorly. Also called mental or submental crests.

chine = 1) backbone.

chine = 2) cut through the backbone.

chine = 3) a cut of fish (and meat) including at least part of the backbone.

chined = a fifteenth century word for dressing salmon (preparing this fish for consumption), no longer in use.

Chinese fishing net = a shore-operated lift net, 20 metres or more across and 10 metres or more tall, found in Cochin (Kochi), south India. The net is a cantilever with the net suspended over the sea and large stones suspended from ropes as counterweights at the other end. Requires up to six fishermen to operate. Named for their supposed Chinese origin.

Chinese herbology = use of herbs in traditional Chinese medicine. Seahorses, for example, are ground up with various herbs and used to treat impotence. Import and export of seahorses has been controlled under the Convention on International Trade in Endangered Species since 15 May 2004.

Chinese major carps = commercially important fishes of the family Cyprinidae, used in aquaculture, namely *Ctenopharyngodon idella*, *Cyprinus carpio*, *Hypophthalmichthys molitrix*, *Hypophthalmichthys nobilis*, and *Mylopharyngodon piceus*. See also Indian major carps and Indian minor carps; there does not appear to be any Chinese minor carps.

chinook salmon disease = infectious haematopoietic necrosis (an acute Rhabdovirus-group viral disease of salmonids transmitted from fish to fish and by eggs in western North America, e.g. in chinook and sockeye salmon and rainbow trout. The disease destroys the haemopoietic tissues in the kidney and spleen. Fish become lethargic or hyperactive, dark in colour, develop popeyes, anaemia (pale gills) and a swollen belly, and produce faecal casts. Haemorrhages on the skin, viscera and fins occur. Particularly affects fish less than 5 cm long in water below 10°C with high mortality. Potentially dangerous to humans. Abbreviated as IHN).

chip = 1) fish chip (a delicatessen, potato chip-like product made of equal parts of fish and potato).

chip = 2) potato chip fried in fat or oil and often served with fried fish (fish and chips).

chip = 3) said of salmon, to cut the surface of the water without leaping (Northumberland dialect).

chipper = chippy.

chippie = chippy.

chippy = 1) a fish and chip shop in Britain. Also spelled chippie.

chippy = 2) a carpenter.

chirashi-zushi = "scattered sushi", a bowl or box of sushi rice with a variety of sashimi (usually nine, a Japanese lucky number).

chironym = cheironym.

chirotypes = cheirotype.

chirping = gulping of air which is then emitted through the gills in fine bubbles causing a chirping sound, e.g. in *Glandulocauda inequalis* (Characidae).

chistlings - chitlings.

chitlings = small parts of cod intestines cooked as a delicacy (Newfoundland). Also spelled chiddles, chidlins and chistlings.

chloramine = an ammonia-chlorine chemical sometimes used as a bactericide in municipal water supplies. It is poisonous to fish, but can be removed with special compounds available in aquarium stores, e.g. a double dose of sodium thiosulphate. Unlike chlorine, it will not evaporate from water by itself. Fish with chloramine poisoning dart around rapidly and may leap out of the water, show pigment changes and exhibit hypoxia, and may die.

chloride secreting cell = a cell in the gills, especially along the bases of the secondary gill lamellae and the pseudobranchs when present, or in the opercular epithelium, which excrete chloride, potassium and sodium ions in marine fishes. These cells maintain the osmotic balance from the loss of water via the gills and the necessity of drinking sea water. Also called ionocyte.

chlorine poisoning = similar to effects of chloramine and like it may be chronic with no specific signs or acute as detailed above. The fish should be removed from the contaminated aquarium.

chlorinity = the total amount in grams of chlorine, bromine, and iodine contained in one kilogramme of seawater, assuming the bromine and iodine to be replaced by chlorine. Salinity in parts per thousand (‰) =  $1.80655 \times Cl (\%)$ . Abbreviated as Cl.

choana (plural choanae) = an internal canal connecting the nasal and the buccal cavities; internal nares, e.g. in derived Sarcopterygii. The analogous structures in Diploï are not true choanae.

choanae = plural of choana.

chocolate fish = a chocolate-covered marshmallow fish, often given as a treat or offered as a reward (New Zealand slang).

choice = 1) the designation of a high quality cure or cull of salted cod-fish.

choice = 2) prolific in fish, in reference to a fishing ground.

choke = 1) a triangular piece at the wing end of a purse seine, used to get the float and load lines while heaving the net by a power block.

choke = 2) a method of baiting herring for slow trolling.

choke = 3) killing fish in a gill net, the squeaking noise made when a herring is removed from a gill net, the act of killing them by removing them from the water, or a combination of the above. See herring choker.

choline = hydroxyethyl trimethyl ammonium hydroxide, a structural component in adipose and nerve tissue which may cause poor growth in fish when deficient.

choller = the gills of a fish (British dialect).

cholly = choller.

chondral = of or pertaining to cartilage.

chondro- (prefix) = of or pertaining to cartilage.

chondroblast = a precursor cell of a chondrocyte; these cells migrate to centres of cartilage formation during development.

chondrocranium (chondrocrania) = the cartilaginous skeleton enclosing the brain, olfactory region, eye and inner ear. Part of skull first formed in the embryo. Forms the whole skull in Cyclostomata, Elasmobranchii and Holocephali. Covered by dermal bones in Teleostomi and replaced by the osteocranum with only remnants between bones allowing for growth. Sometimes called the neurocranium or endocranum.

chondrocyte = a cell that makes the supporting matrix (collagen) of cartilage; usually found in lacunae embedded in the supportive matrix. Derived from chondroblasts.

chondroneurocranium = the cartilaginous braincase of Chondrichthyes.

chop = slapping the surface of the water with the tail when swimming in schools or enclosed in a net. said of cod in Newfoundland.

chop-stick = a cross-stick of iron wire, whalebone, or other materials attached to a sea-fishing line to keep the snood and hook clear of the sinker (British dialect).

chopped herring = pickled herrings finely chopped with apples, bread, onions and eggs, and vinegar, oil and sugar (Ashkenazi cuisine).

choppy sea = short and rough waves falling with a short and quick motion, easily breaking at the crest.

choran = a lake formed near river channels (India).

chorda dorsalis (chordæ dorsales) = notochord (the skeletal rod consisting of a sheath firmly packed with cells which lie above the gut and below the nerve cord. The notochord is persistent when it remains as a continuous skeletal support (e.g. Amphiobi, Holocephali, Acipenseridae, Petromyzontiformes, etc.) and is constricted when displaced by vertebral centra, occupying anterior and posterior cavities).

chorda mesoderm = the notochord rudiment.

chordacentrum = the vertebral centrum formed by the conversion of the chordal sheath into a series of ring-like cartilaginous segments around the notochord and subsequently biconcave discs. The bases of the neural and haemal arches abut the chordacentrum. Found only in Elasmobranchii.

chordal = referring to the notochord.

chorion = an embryonic membrane, elaborated by the follicle cells, which encloses the egg. The eggs of truly viviparous fishes are non-chorionated. Usually hardens on contact with the water; after fertilization the egg secretes fluid and shrinks inward leaving a perivitelline space. May lie external to the zona radiata. Called egg shell in fish.

chorionic thread = one or a series of threads on the chorion of some eggs, the number and length varying with the species.

choroid = a black pigmented vascular layer of the eye between the retina and the sclera, preventing reflection of light in the eye.

choroid fissure = an indentation at the ventral margin of the eye marking the invaginated borders of the optic cup in larval fish. Usually associated with narrow eyes and often pigmented.

choroid gland = a gland on the dorsal half of the fish eyeball.

choroid tissue = a primordial vascular tissue mass lying below the eye, often unpigmented. In studies of larval fishes its length is measured along its longitudinal axis from the interface with the pigmented portion of the eye to the tip of the choroid mass.

choroidal guanine tapetum = the tapetum lucidum, *q.v.*, in Elasmobranchii.

chorology = study of the processes governing natural geographical distribution.

chorotype = an unofficial term for a local type. In palaeontology, a fossil from the same stratum as the type but a different locality.

chorusing = sound production in fishes associated with reproduction. Various websites have recordings of the sounds made.

chott = a depression surrounding a salt marsh or lake, or the bed of a dried salt marsh (in North Africa). Also spelled shott.

chouder = an older spelling of chowder.

chowder = 1) fish chowder (a thick soup mix of cooked fish and/or shellfish and potatoes in a broth made from pork, flour, seasonings and fish stock).

chowder = 2) a fish monger (archaic).

chowter = a female fish-monger (English dialect).

chresonym = an unofficial term in nomenclature for the later citation of a name than the one which established the name. The later publication often has a fuller description.

Christmas fish = dried and salted cod eaten on St. Stephen's Day, 26 December in Newfoundland.

Christmas tree = a purse seine with fishes stuck in the mesh.

chrom(o)- (prefix) = colour.

chromaffin tissue = an endocrine tissue located in or near the kidneys which secretes adrenaline and which controls the blood pressure and regulates the chromatophores.

chromatophore = a dermal pigment cell; sometimes seen in the epidermis. Aggregation or dispersion of the pigment by expansion or contraction of a circular muscle surrounding an individual chromatophore effects color changes. Chromatophores are of two types, biochromes and schematochromes, q.v. See also melanophore, erythrophore, xanthophore and iridocytes.

chromer = angling term for a bright fresh fish (in British Columbia).

chromosomotype = an unofficial term in nomenclature for the type of a new species based only on chromosomal evidence.

chryopsin = a golden colored retinal pigment found in deepsea teleosts. Its absorption curve is similar to the spectral emission curve of bioluminescence, indicating that eyes containing it are probably used for observing photophores, e.g. in *Myctophum punctatum*.

chub = 1) a name applied to various unrelated fishes which have short, thick and rounded bodies and large heads.

chub = 2) a foolish fellow, easily imposed on, from the fish easily caught (obsolete slang).

chub-cheeked = having chubby cheeks, from the rounded appearance of the chub fish.

chub-faced = having a chubby face, from the rounded appearance of the chub fish.

chubber = a hollow, plastic float fished with large bulk shot.

chubby = round and plump; overweight. Supposedly derived from the thick-bodied and round-cheeked cyprinid fish *Leuciscus cephalus*, the chub of Europe.

chug = a jerk or pull on a fishing line given by a fish.

chugger = a top-water plug having a cup-shaped mouth, splashing or chugging when retrieved. Smaller than a popper, *q.v.*

chum = cut up fish or meat mixed with blood and garbage and used to attract fishes, such as sharks, to a fishing area. In a sense the British ground bait, *q.v.*, is a form of chum used to attract non-predatory coarse fishes.

chum bag = a mesh bag filled with chum and hung overboard from a boat or, as a small bag, trolled deep.

chumline = throwing live bait in ones and twos behind a boat to attract fish.

chumming = the act of spreading chum in the water.

chumslick = cut up fish pieces in a bag kept in the water alongside a boat to form a slick attractive to fish, particularly sharks, or the narrow band of water extending behind a boat from chumming.

chundery headed = having a large head, e.g. a lean cod (Orkney dialect).

chunk = 1) a commercial definition of a mixture of pieces of fish flesh which mostly has dimensions of not less than 1.2 cm in each direction and in which the original muscle structure is retained.

chunk = 2) a cross-section of a large dressed fish containing the backbone. Ready for cooking.

church key = a name for the small key-like device supplied with canned fish such as sardines used to roll open the can. Mainly used for the differently-shaped beer openers and hence church key is sarcasm.

chute = rapidly flowing water over steep, narrowly enclosed bedrock. The surface water is smooth and without the turbulence occasioned by rocks and boulders.

chutoro = medium fatty tuna, from the upper belly, as served in a sushi restaurant.

ciénaga = a marshland (Spanish).

cigar fish = faeces in a swimming pool or the ocean.

cigar minnow = a scad family member sold as frozen bait in Florida, firm textured. Used for catching offshore fish.

ciguatera poisoning = a poisoning resulting from eating ciguatoxic fishes (or sometimes algae or invertebrates), with tens of thousands of cases each year. Symptoms 3-5 hours after ingestion usually include abdominal pain, nausea, vomiting, watery diarrhoea, and numbness and tingling in the mouth region which spreads to the extremities. Painful ejaculations and burning sensations during intercourse are also reported and can last for a month. Acute symptoms

disappear in 8-10 hours, most in 24 hours in moderate cases. In severe cases weakness, visual disturbances, skin disorders, temperature perception reversals, coma and even death (up to 20% mortality) may occur. Death appears to result from asphyxia. The toxin appears to be an "irreversible" anticholinesterase. An attack does not impart immunity. Diagnosis should be confirmed by history of ingestion and by the observation of the effect of atropine (will cause marked atropinization unless anticholinesterase intoxication is present) and by the estimation of acetylcholinesterase level in red blood cells. Treatment consists of artificial respiration with oxygen added as needed, atropinization (after recovery from cyanosis), dosing with protopam chloride and indicated symptomatic measures. The stomach should be emptied by gastric lavage, emetics or saline purges as soon as possible.

ciguateratoxin = ciguatoxin.

ciguotoxic fishes = those fishes causing ciguatera poisoning. These are usually insular marine fishes in the tropics, subtropics or warm temperature zones, best known in the tropical Pacific and Indian Oceans and West Indies. But geographical occurrence is spotty, and fish may be poisonous in only part of an island. Numerous species have been found to be ciguotoxic but in other places or in other years they are safe. Ciguotoxic fishes are usually bottom dwellers or feed on bottom dwelling fishes. Toxicity may be due to consumption of an algae (benthic dinoflagellate) by the fish or by one of its prey. The principal dinoflagellate is *Gambierdiscus toxicus*. Examples of ciguotoxic fishes include Muraenidae, Holocentridae, Acanthuridae, Lutjanidae, Scaridae, Serranidae, Sphyraenidae.

ciguotoxication = poisoning from ciguotoxic fishes.

ciguatoxin = the poison causing ciguatera poisoning. Exact chemical and pharmacological properties are unknown. May be a complex biotoxin with several fractions or several chemically unrelated compounds. May be a phospholipid. The formula C<sub>28</sub> H<sub>52</sub> NO<sub>5</sub> C<sub>1</sub> has been proposed.

cilia = plural of cilium.

ciliate = ciliated.

ciliate scale = a scale having comb-like, smooth teeth along its free edge, e.g. in characoids.

ciliated = fringed with projections.

ciliated scale = a ctenoid scale having very elongate, soft, flexible ctenii (spines) on its posterior margin, e.g. *Capros aper*.

ciliiform = hair-like.

cilium (plural cilia) = a fin thread of cytoplasm projecting from the surface of a cell. Moves fluid surrounding it by beating or is sensory as in the lateral line system, q.v.

cinch knot = clinch knot.

cingulum pectorale (plural cingula pectoralia) = pectoral girdle (the bony support of the pectoral fin behind the gills and usually attached to the posterior part of the skull; the "shoulder" girdle. Composed of the following basic elements (some of which may be lost): coracoid, scapula, pterygials, postcleithrum, cleithrum (main bone), supracleithrum and posttemporal. The "primary" pectoral girdle includes actinosts, scapula, coracoid, and sometimes mesocoracoid cartilage or endochondral bones and supports the fins directly. The "secondary" (and more primitive) pectoral girdle encloses the dermal post-temporal, supracleithrum, cleithrum, and two postcleithra, which are membrane bones and is only indirectly related to the fins. Also called scapular girdle).

cingula pectoralia = plural of cingulum pectorale.

cioppino = a fish stew in Italian cuisine, usually made from the catch of the day including shellfish as well as fish with fresh tomatoes in a wine sauce. Served over spaghetti and toasted buttered bread.

*circa* = about. Abbreviated *ca.*

circadian = pertaining to a daily and rhythmic biological cycle.

circalittoral = the lower sublittoral zone in the sea dominated by photophilic algae; the depth zone between 100 and 200 metres.

circannual = approximately one year.

circle gill net = a gill net in shallow water drawn around a school of fish so that the fish may be scared into gilling themselves

circle hook = a wide circular hook with the point curved in such a way that most fish are hooked in the mouth. Useful for catching and releasing fish as it is seldom swallowed. Compared to j-shaped hooks, this hook holds bait better, has greater holding power, and more hookups. The harder the fish pulls the more strongly the hook is embedded.

circular pond = a circular, concrete raceway with a central drain, water being introduced in such a way as to ensure an even circular current. Common in aquaculture.

circular tank = a round tank with an outflow in the centre; common in aquaculture.

circuli = plural of circulus.

circulus (plural circuli) = the concentric ring or polygon found on scales; also called ridge.

circum- (prefix) = around, about, surrounding.

circumaustral = around the southern hemisphere in the higher latitudes.

circumboreal = around the northern hemisphere in the higher latitudes.

circumference scale count = count of all the longitudinal scale rows around the body starting with the scale immediately in front of the dorsal fin.

circumglobal = around the world, as in distribution of certain fishes.

circumnarial fold = a skin fold around the nostrils in Chondrichthyes. Also called perinasal groove or circumnarial groove.

circumnarial groove = circumnarial fold.

circumneutral = said of water with a pH of 5.5 to 7.4.

circumoral teeth = the innermost row of teeth lateral to the mouth of lampreys (Petromyzontiformes).

circumorbital = one of a series of superficial dermal bones encircling the eye including the suborbitals and supraorbitals. A complete circuit of bones is found only in such primitive fishes such as *Lepisosteus* and some Osteoglossidae.

circumorbital sulcus = the groove in the epidermis surrounding the orbit that facilitates rotation of the eye in its socket. Present in many fishes but absent in *Lepidogalaxias salamandroides* (Lepidogalaxidae) which has an immobile eye.

circumpeduncular scale count = number of scales around the narrowest portion of the caudal peduncle.

circumpolar = having a more or less continuous distribution around either pole.

circumscribe = to make a circumscription.

circumscription = the defined or diagnostic limits of a taxon, or the sum of individuals within those limits, as defined by an author.

circumtropical = organisms which occur around the tropics of the world (in sea or on land).

cirrhi = plural of cirrus.

cirrus (plural cirrhi) = cirrus.

cirri = plural of cirrus.

cirrose = with cirri.

cirrus (plural cirri) = fringe-like fleshy appendages, usually slender and elongate.

*cit.* = abbreviation for *citatus*, meaning to cite, cited.

*citatus* = to cite, cited.

CITES = the Convention on International Trade in Endangered and Threatened Species. Regulates trade in live and dead animals and plants in an effort to conserve those species in danger of extinction.

clacker = a metal device added to buzzbaits, *q.v.*, to make additional noise.

clade = a group defined by at least one shared derived character or synapomorphy inherited from a common ancestor; all descendants of any given species; a monophyletic higher taxon, a branch on a cladogram.

cladism = cladistics.

cladistics = a method used by systematists to determine evolutionary relationships. The distribution of shared derived characters (synapomorphies) is used to test relationships and taxa can thus only be defined by genealogy or descent. Relationships of taxa are presented as cladograms, *q.v.* The number of characters used is important as the best cladogram will be one supported by the most characters. Characters should be independent of one another so that they are not redundant (expressing the same character state in a different fashion, e.g. large eye and small snout may not be independent as a large eye in a head of uniform size may be larger at the expense of snout length). Each cladogram is a hypothesis subject to testing and rejection. Also called cladism or phylogenetic systematics.

clado- (prefix) = branch, offshoot.

cladodont = a form of early shark tooth, characteristically with a large central cusp, a broad base and smaller lateral cusps, found in sharks such as *Cladodus* from the Upper Devonian. See also diplodont, hybodont and symmorid.

cladogenesis = the development of a new clade; the splitting of a single lineage into two distinct lineages; speciation.

cladogram = a dendrogram or tree-like diagram expressing the evolutionary relationships among a group of organisms in terms of recency of common ancestry or descent. All taxa are terminal in position, the identity of nodes (ancestors) are not specified and connecting lines represent shared derived characters (synapomorphies). Any two branch tips sharing the same immediate node are most closely related. A cladogram only specifies the relative degrees of phylogenetic relationship (sistergroup relationships) of the analysed taxa, as well as their monophyly.

clamp = a type of fish spear with several prongs that hold a fish without excessive injury. The prongs may be pointed and barbed too but the purpose of the clamp is to secure the fish with little damage.

clamped fins = a posture adopted by a fish where it holds its fins tightly against its body. Usually a sign of distress or sickness.

Clarenville boat = a small wooden motor-boat built at Clarenville, Newfoundland by the government during World War II and later converted to refrigerator ships.

clarity = the degree of visibility in a body of water. Determined by water colour and turbidity.

Clark = a measure of hardness. English degrees of hardness are rarely used in the UK. One degree Clark is equal to 14.3 mg/l CaCO<sub>3</sub>.

Clarissa = an individual *Cyprinus carpio* weighing about 44 lbs caught in Redmire Pool, Herefordshire, England by Richard Walker in September, 1952. This was a record for the species in Britain, a country not noted for large freshwater fishes. Clarissa became legendary among anglers and lived out the rest of her life at the London Zoo.

clasper = the rod-like extension of the medial portion of the pelvic fin in male Elasmobranchii and Holocephali. Claspers are used as intromittent organs (not in clasping), the grooves on their facing surfaces together forming a tube for the transmission of sperm when the claspers are held together. The anterior proximal opening is called the apopyle, the posterior distal opening the rhipidion. Claspers are also known as myxopterygia. A unilateral pectoral clasper is known in certain poeciliids. See also cephalic clasper.

clasper gaff = the hook-like structure on the inside of the clasper. Derived from denticles, e.g. in *Squalus*.

clasper hook = the reversed denticle on claspers which point toward the base. Found in certain Scyliorhinidae.

clasper spine = one or more needle-like spines which project from the distal end of claspers and are proportionally much larger than clasper hooks. Derived from denticles, e.g. in *Squalus* and the Jurassic *Paleospinax*.

clasper spur = the conical or claw-like structure formed by fusion of tesserae on the claspers of certain sharks, e.g. *Heterodontus*, *Ginglymostoma*, *Alopias*, *Cetorhinus*.

clasping = a common reproductive act in fishes where the males uses his fins to clasp or wrap around the female. The action stimulates egg deposition, brings genital openings close together or facilitates intromission.

clasping organ = clasper.

class = the taxonomic group above order and below phylum. The class-group includes subclass, class and superclass and is not covered by the International Code of Zoological Nomenclature, e.g. Class Actinopterygii.

class frequency = 1) number of individuals occurring in a given class, possessing common attributes.

class frequency = 2) frequency of occurrence of a given class, e.g. age group.

classical = pertaining to a name that is derived from Latin or ancient Greek.

classification = like organisms grouped within a hierarchical system, the process of arranging these organisms.

clat = a bunch of worms, having worsted drawn through them (English dialect).

clathrate = resembling an open latticework.

clatter = a fisher for eels.

clatting = fishing for eels with a cluster or clot of worms, each of which has had a strong worsted drawn through the length of its body (English dialect). See also quod, clotting and reballing.

claustrum = the first of the four Weberian ossicles, *q.v.* It receives vibrations from the scaphium and transmits them to the perilymph of the sinus impar.

clavate = club-shaped.

clavicle = paired dermal bone ventral to the cleithrum in Acipenseridae and Amiidae. Lost or fused with the cleithrum in Teleostei. Clavicle was sometimes misapplied for cleithrum.

clavicula (plural claviculæ) = clavicle.

claviculæ = plural of clavicula.

clavicular spine = a spine in the shoulder region.

claviform = club shaped.

clavus = the rudder-like lobe at the hind end of the body in Molidae.

clay = a sedimentary material with grains smaller than 0.2 mm (or 0.004, sources vary) in diameter.

cleach-net = a hand-net or dip-net used in shallow, muddy waters to catch small fish (English dialect).

cleacher = a fisherman using a cleach-net (English dialect).

cleaching-net = a large bag net drawn across rivers in time of flood (English dialect).

cleaching-water = shallow or rain swollen and murky water in which a cleach-net or cleaching-net may be used (English dialect).

clean = water with abundant plankton for the fish but lacking the organisms which cause slub (*q.v.*) to clog nets (Newfoundland). A good area for fishing even though the water is murky. See also dirty.

clean fish = mended fish (post-spawning fish that have or are recovering).

clean the fish = to skin or lead on a victim as in a carnival game. See also feed the fish.

cleaner = a fish which picks dead tissue and parasites off other fishes. Cleaner fish may establish a cleaning station and have a particular behaviour (dance, invitation posture) and colouration which clues other fishes into their function and prevents them from being eaten.

cleaning = the act of cleaning a fish for food. See fish cleaning in Symbols.

cleaning station = a site visited by fishes, often on a reef where cleaning shrimp or fish remove parasites from their bodies.

cleanplate herring = herring filleted by a machine which removes fins, bones and part of the belly wall.

clear fish soup = fish broth, bouillon.

clear water method = raising larval fish where food is cultured separately and added to the larval tank at intervals.

cleared and stained = a specimen with some tissues rendered transparent by various chemical treatments while others are stained to enhance their visibility. In fish osteological studies, the flesh is cleared with enzymes or potassium hydroxide and the bones stained red with alizarin red S and the cartilage blue with alcian blue. Abbreviated as c & s on labels and in museum catalogues.

clearwater = water with low suspended solids and a high transparency, cf. blackwater.

cleat hitch = a knot for tying up a boat to a wedge-shaped cleat made by passing a line around the arms of the cleat in a figure 8, then partially forming another turn, closing it to make a loop and pulling it taut. Various websites have animated steps showing how to tie this knot.

cleavage stages = initial stages in embryonic development where divisions of blastomeres are clearly marked. Usually the first through sixth cleavages (2-64 cells).

cleek = 1) a barbed hook used to land salmon; a salmon gaff (Ayrshire dialect). Also spelled click, cleik, kleek, kliek and cleeque.

cleek = 2) to hook, catch up or fasten on a hook or to fish out with a hook. Also spelled click, cleik, kleek, kliek and cleeque.

cleek = 3) a salmon net set in a river in a curve form (Scottish dialect).

cleeque = cleek.

cleft = a slit-like opening, e.g. the interruption in the thickened lower lip in Catostomidae.

cleidoic = said of an ovum containing enough nutritive material for the production of a complete embryo.

cleik = cleek.

cleithra = plural of cleithrum.

cleithral = adjective from cleithrum.

cleithral head spine = a spine on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

cleithral stripe = a stripe, usually dark and evident, running from the upper gill opening down to the pectoral fin base.

cleithral symphysis = the junction of the ventral and anterior ends of the cleithra, often visible as a cartilaginous ridge in larvae.

cleithrum (plural cleithra) = the principal bow-shaped bone of the pectoral girdle, dermal in origin, forming the rear margin of the gill cavity. It articulates dorsally with the supracleithrum and ventrally with the scapula and coracoid, and meets its opposite pair medially under the heart. Used in age estimation, where it is more reliable than scales in some species, e.g. *Esox masquinongy*.

clems = fish and potatoes fried together (Cornish dialect). Also called pick-up.

clevis = a swivel attached to a spinner blade which allows it to rotate on retrieval.

clew = corner of a fish net.

click = 1) a cork shaped like a fish used to catch seagulls. It was covered with mackerel skin, baited with meat, and armed with two hooks.

click = 2) cleek.

click drag = a drag or resistance on a reel which makes a clicking sound. It slows and tires a hooked fish.

click hook = a large barbed hook for catching salmon, comprised of hooks bound together shaft to shaft, used in poaching. Poachers throw them beneath the fish, and with a sharp click strike them into the belly.

click net = a net used for holding over the water to catch salmon as they jump.

clicker cork = a styrofoam cork, thin and about 3 inches long, mounted on an 8 inch wire. A yanking retrieval produces a clicking sound similar to the one that shrimp make and this attracts fish to bite. Used on shrimptail jigs above a grass bottom.

clidost = urohyal (a flat, median, deep, endochondral bone below the ceratohyal; a tendon bone arising in the septum between the longitudinal muscles of the isthmus. Absent in such primitive fishes as *Lepisosteus*. Also called clidost, episternal, interclavicle and parahyoid).

clinch knot = half blood knot (a knot used by anglers to attach swivels, hooks and lures to the main line. Various websites have animated steps showing how to tie this knot).

clinched half blood knot = a knot used by anglers to attach swivels, hooks and lures to the fishing line; seemingly a tautology. Various websites have animated steps showing how to tie this knot.

clinching net = a bag net used for fishing. The net is attached to a semicircular hoop, having a transverse piece, to the centre of which a pole is fixed. The net is put gently into the stream, and drawn towards the bank when the river is in flood, and the fish drawn to the sides (English dialect).

cline = a geographical gradient in a character, e.g. increase northwards in number of vertebrae in fish.

clinker = a form of seaworthy boat construction built with planks overlapping the one below. Also called lapstrake.

clinolimnion = that part of the hypolimnion of a lake where the rate of heating falls exponentially with depth.

clip = 1) clamp.

clip = 2) a gaff or strong iron hook with a wooden handle, used for landing fish (British dialect). Also spelled clep, clipe, klip and klepp.

clipe = clip.

clip-on weight = a flattened lead weight with prongs and of various sizes which can be clipped on to swimfeeders (*q.v.*) for added weight.

clipfish = salted whole dried fish, often cod (*Gadus morhua*). Famous in Norway where it is dried in the sun (from the Norwegian klippfisk, klepp being a rock by the water and fisk being fish).

clipped herring = brined herring with the heads and most of guts removed. Also called cut herring.

clipped roe fish = alewives (*Alosa pseudoharengus*) with the heads and guts removed but with the roe left inside.

clipper = high-quality swordfish or dolphin (fish) caught and frozen at sea.

clippet = a large hook fastened to the end of a stick, used in landing fish in sea fishing (English dialect).

**cloaca** = the vestibule into which empty the urogenital and digestive canals and which opens ventrally to the exterior, usually just in front of the anal fin, e.g. in Elasmobranchii, Acipenseridae.

**cloacal appendage** = tissue next to the cloaca, enlarge and often pointed.

**cloacal aperture** = the opening of the cloaca.

**clone** (noun) = 1) a group of descendants of the same genetic constitution from a single parent; see gynogenesis.

**clone** (verb) = 2) to produce clones.

**clonotype** = an unofficial term for the phenotype or homogenous product of cloning.

**cloop** = a distinctive sucking sound made by fish such as carp (*Cyprinus carpio*) at the surface when feeding.

**close** = gutted but not fully split open fish.

**close fish** = a whole smoked haddock with its backbone retained, usually gutted and headed (Scotland). Initially cold smoked for several hours, then hot smoked. Also known as Arbroath smokie, Auchmithie cure, pinwiddie.

**closed area** = an area closed to fishing by season or temporarily to protect spawning fish or juveniles.

**closed basin** = a basin without visible surface outflow.

**closed containment system** = an aquaculture facility on land or in the sea in which water is re-used, has a processing system for wastes, and escapes of farmed fish are impossible.

**closed mating system** = a breeding programme in which no outside fish are allowed. This ensures the progeny are from a known parental combination.

**closed sea** = 1) a part of the ocean hemmed in by narrow straits or headlands.

**closed sea** = 2) a part of the ocean within the territorial jurisdiction of a state. Opposite of open sea.

**closed season** = a fishing ban by season but also by time, area, or species, usually to protect spawners or young, cf. open season.

**closed system** = closed containment system.

**closed to retention** = for conservation purposes, fish caught by anglers must be returned alive to the water. Also called catch and release, non-retention and daily limit 0.

**closed waters** = waters where it is illegal to fish.

closed-cycle system = an aquaculture unit where the water is treated and re-used rather than being replaced with fresh water.

closed-face reel = an angling reel with a fixed spool enclosed by a housing and the bail arm replaced by a small pick-up pin. The line emerges from a central hole. Used in spinning and light float fishing.

closure = 1) the banning of fishing during a particular time (temporal closure) or place (spatial closure) or both.

closure = 2) completion and start-up of a dam.

clotting = clatting.

cloudbait = a fine groundbait which forms a cloud in the water to attract fish to the hook and its bait. Necessarily used in still or slow moving waters.

clough = a steep-sided valley or tributary to another valley (Lancashire).

clouser minnow = a streamer (*q.v.*) pattern that imitates baitfish, named for the designer Bob Clouser.

clout = a measure of nets, about 4 yards long (British and Scottish dialect).

clove hitch = a knot used to attach a boat, for example, to a post quickly. It is made by dropping two half-hitches (see double half-hitch) over and around the post. Various websites have animated steps showing how to tie this knot.

clown = a colour used in hard jerk baits comprising a chrome body with a chartreuse back and red head or face.

club = 1) a device used to stun or kill a fish when captured on hook and line or in a trap. Can be a simple piece of wood or intricately shaped and carved as with the Haida fish clubs of western Canada.

club = 2) an association of individuals devoted to angling. See also anglers association.

club = 3) an association of individuals devoted to keeping fish in aquaria.

club cell = a specialised, club-shaped cell in the epidermis which produces, e.g., pheromones in members of the Cypriniformes.

clubbing = swelling of the tips of the gill filaments.

clubcell = club cell.

clupeoid fish poisoning = clupeotoxicism.

clupeotoxic fishes = those fishes causing clupeoid fish poisoning; certain clupeiform members of the families Clupeidae, Engraulidae and Elopidae in the tropical Atlantic Ocean, Caribbean Sea and tropical Pacific Ocean. Tropical clupeiform fishes according to some reports are most likely to be toxic during the warm summer months. Toxicity may be due to the fishes consumption of a dinoflagellate.

clupeotoxin = the poison in clupeotoxic fishes. It is a neurotoxin, palytoxin, found in marine algae and presumably ingested by the fish.

clupeotoxicism = a form of fish poisoning caused by eating clupeotoxic fishes. A sharp metallic taste on ingestion may be followed by nausea, dryness of the mouth, vomiting, malaise, abdominal pain and diarrhoea, nervous disturbance such as dilated pupils, muscular convulsions, coma and death. Symptoms ensue very rapidly - death may occur in less than 15 minutes and the fatality rate is high (about 45%). Treatment is symptomatic.

cluster = 1) a temporary grouping of a few schools or elementary population of fishes.

cluster = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for porcupinefish.

cluster analysis = a method of grouping taxa on the basis of similarity or distance.

cluster eggs = portions of roe with membranes and eggs adhering.

clustering = milling about exhibited by territorial fishes. May include displays and chases.

clutch = the number of eggs laid at any one time. May refer to groups of eggs laid in a nest.

clutch overlap = superfetation (the simultaneous development of several broods within the ovary where they are nourished; enabled by the entrance and storage of sperm in the ovary, e.g. in Poeciliidae. Also spelled superfoetation).

clutch size = clutch.

clutch tender = an ecological group of reproductive guilds (*q.v.*) where the fish look after the eggs once laid.

clystotremic = pertaining to tide pools.

C-mormyromast = electroreceptor (an organ which detects the presence of an electric current).

cm<sup>3</sup> = cubic centimetre (0.0338 fl oz, 0.00211 pt, 1.0 mL).

CNS = central nervous system.

co- (prefix) = together, sharing, with, jointly.

co-adventurer = a member of a fishing crew whose pay depends on the value of the catch rather than on a fixed wage (Newfoundland).

co-management = the sharing of authority, responsibility, and benefits between government and local communities, non-governmental organisations, research institutions, etc. in the management of fish stocks.

co-range line = a line linking all points on a map having the same tidal range.

co-tidal line = a line linking all points on a map having the same tidal stage or phase.

coachman = a fly-fisher's rod, in allusion to whipping the stream (slang).

Coad = 1) dweller at a wood (Celtic), or pre-7th Century "cod(e)" meaning bag (Old English), or a nickname for a fishmonger from "codde" meaning appropriately fish (Middle English), or a variant of Cody which is an Anglicized form of the Gaelic O Cuidighthigh meaning descendant of Cuidightheach, a byname for a helpful person (also appropriately).

COAD = 2) chronic obstructive airway disease.

coagulant = a chemical compound used in water clarifiers in aquaria. It causes fine particles to stick together such that they are more easily removed by the filter.

coalesced = fused, e.g. teeth of Scaridae are coalesced in varying degrees to form a "plate".

coarse fish = those kinds of fish not sought after by sports fishermen, or regarded as of lesser importance, perhaps caught for sport but not food. In Britain sport fish are basically Atlantic salmon and brown trout, all other fish being considered coarse fish including northern pike and perch considered as sport fish in North America. Coarse fish are often various members of the carp family (Cyprinidae) in Britain. Catch and release is the norm and keeping coarse fish is against the rules on many waters. Some fish, particularly carp, have been caught many times and are very suspicious of baits and much sought after. Most coarse fishing is static with a bait remaining for long periods in one place (except in rivers), boats are seldom used, groundbait or chum is used to attract fish to a swim or fishing spot, casts can be over a hundred yards away from the angler, rods are very long and rigs are highly specialised and refined. Lures are not in common use in Britain because most coarse fish are not predators and do not chase them. See also match fishing and pole for further details on British methods of fishing.

coarse sediment = sediment with a particle size greater than 2.0 mm. Includes gravel, cobbles and boulders.

coarse vegetation = a loosely used term for emergent plants, especially coarser ones such as reeds.

coast = the contact between the terrestrial and aquatic environment. Variously defined as equivalent to the shore or much wider than the shore. Extends inland to the first major change in terrestrial features.

coast fishery = 1) an inshore fishery.

coast fishery = 2) specifically, the inshore cod fishery of Newfoundland.

coast ice = sea-ice which forms and remains fast along the coast, attached to the shore or to grounded icebergs. Also called fastice.

coastal aquaculture = fish farming in sheltered bays in coastal areas or on low-lying land on the coastal plain.

coastal pelagic = an offshore fish that migrates along the coast but is not a true open ocean fish.

coastal zone = extends from the continental shelf break or 200 nautical miles offshore (the seaward extent of the exclusive economic zone) to the shoreline and up coastal rivers to the head of tidal influence.

coaster = a brook trout (*Salvelinus fontinalis*) that spends part of its life at sea or in the Great Lakes.

coastline = seaward margin of the land, which is usually equivalent to the high tide shoreline.

coating = fish products may be marketed with a coating, e.g. of batter and breadcrumbs.

coaxer = decoy (an imitation of a fish used to attract fish close enough to be speared. Used in ice fishing in North America).

cob = 1) a heap of salt herrings (English dialect).

cob = 2) a young herring (archaic).

cobb = cob.

cobbin = a piece or slice of an eel, or of any other fish (obsolete).

coble = a flat-bottomed, single-masted North Sea fishing boat. See also plosher (1).

cobble = 1) substrate particles that are smaller than boulders and larger than pebbles, and are generally 64-256 mm in diameter (other sources have 64-128 mm). Can be further classified as small and large cobble. Commonly used by salmonids in the construction of a redd, q.v.

cobble = 2) coble (2).

cobble = 3) to throw stones into a hole in the river bed in order to drive fish into shallower water (Cumberland dialect).

cobblestone = cobble.

cobesta = cabesta.

coble = 1) an open or deckless fishing-boat used principally on the north-east coast of England, with sharp bows, flat, sloping stern, and without a keel.

coble = 2) a short, flat-bottomed rowing-boat, used in salmon fishing (English dialect). See also net and coble.

coble-gate = the right of salmon-fishing with a coble; as much as can be fished by one coble (Northumberland dialect).

cobleman = a person who used a flat-bottomed boat for fishing.

coccidiosis = a disease caused by various species of the protozoan *Eimeria*, affecting skin, the intestine, liver and testes, causing nodules, ulcers and granulomas. Important in carp culture.

cochleariform = ear-shaped.

cock = 1) a male salmonid; also used for some other fish species. Hen is the female fish.

cock = 2) cock-boat.

cock-anterbury seed = a fish-poaching drug, *Anamirta coccus*, the seeds of this plant being made into a paste which fish swallow and float to the surface intoxicated where they are easily scooped up. Does not work in running water (Somerset dialect). See also fish berry.

cock-boat = a small rowing boat (English dialect).

cock-fare = a period of fishing for herring using the cock-boat (Sussex dialect).

cock-heaks = the fishing nets of a cock (2).

cock-tail = a small row-boat carried by the larger luggers, with which they communicate with other vessels (Kentish dialect).

cocktail = 1) use of two types of bait on the same hook, e.g. corn and worm, caster and worm.

cocktail = 2) cock-tail.

cocoon = the hard covering of dried mucus formed by Dipneusti inside a burrow formed of dried mud. The cocoon extends into the mouth cavity where it connects the pharynx and lungs with an opening to the burrow so the fish can breathe.

cod = 1) Atlantic cod, *Gadus morhua* (Gadidae), a former mainstay of the fisheries and cultural life eastern Canada and in Europe with many terms associated with its fishery. Many of these terms are in dialects of English or are archaic.

cod = 2) a member of the cod family Gadidae, or related members of the Order Gadiformes (which has over 555 species world-wide), mostly in marine waters. Several species are of major economic importance.

cod = 3) to horse around (British slang).

cod = 4) to fool someone (British slang); i.e. to rise to a bait like a cod fish.

cod = 5) to harass someone by continual criticism or carping.

cod = 6) cash on delivery.

cod = 7) collect on delivery.

cod = 8) a husk, pod, bag or scrotum from the Old English codd.

cod = 9) false or imitative, e.g. cod-Italian cafe, an imitation Italian cafe (British slang).

cod = 10) computing on demand (pay per usage).

cod = 11) mud containing shells from a river bottom.

cod banger = a vessel used in the cod fishery.

cod bank = a submarine bank where cod are found and fished.

cod block = fresh filleted cod, packaged frozen.

cod blubber = cod livers rendered for their oil (Newfoundland).

cod box = an area of the North sea or Irish sea where cod fishing is not allowed during the spawning season.

cod brick = compressed pieces of salted, dried cod.

cod cheek = a delicacy, the muscles between the eye and the preopercle.

cod chest = a chest in which cod are kept alive.

cod chowder = a chowder with cod as its main ingredient.

cod equivalent tonnage = a conversion factor applied to any species subject to TAC (*q.v.*) management and national quotas, equating each species' market value to that of cod (= 1.0). Used as the basis upon which nations exchange quota in different species.

cod farmer = an aquaculturist raising cod to sellable size.

cod fish = to catch cod (*Gadus morhua*). See also cod fish.

cod fisher = 1) a fisher for cod.

cod fisher = 2) a vessel used in the cod fishery.

cod fisherman = cod-fisher (1).

cod fishery = 1) fishing for cod, especially referring to a locally-organised fishery.

cod fishery = 2) the main commercial fishery for cod, *Gadus morhua*, particularly that of Newfoundland.

cod flake = a platform built on poles and spread with boughs for drying split and salted cod (Newfoundland).

cod glut = catch of cod in excess of the capacity to handle or process.

cod hauler = a fisherman engaged in the Newfoundland cod fishery.

cod house = a house built with the profits from the trade in cod in the nineteenth century, e.g. on Jersey whose merchants dominated this trade.

cod jigger = an unbaited hook set in lead sinker, jerked up and down sharply to take cod.

cod jigging = the process of fishing for cod with a cod jigger.

cod head = the head of a cod, used as fertilizer; the fleshy parts being a delicacy in Newfoundland. See also cod's head.

cod line = an eighteen-thread line used for catching cod.

cod liver meal = residues of cod livers after the oil is extracted used in animal feeds.

cod liver oil = 1) oil extracted by boiling the livers. May be made from other gadoids such as haddock. Once used as a basis for paints, to tan leather, and as a dietary and medicinal supplement as it contained vitamins A and D (tastes awful from long personal experience (BWC) in the 1940s and 1950s when taken in liquid form, only marginally better when encapsulated).

Cod Liver oil = 2) a Newfoundland song based on the product above, which in that country was sun-cured and sold raw in bottles.

cod liver paste = a paste made from cod livers with spices and other flavourings.

cod man = a vessel used in the cod fishery.

cod net = twine net placed vertically in the water to enmesh cod by the head and gills; gill-net.

cod nobbin = a fleshy piece cut from the neck of the fish when the head is removed while preparing the body for salting.

cod oil = 1) an inferior cod liver oil used in leather manufacturing.

cod oil = 2) cod liver oil.

cod pitchings = the lowest quality of cod liver oil, formerly made by allowing cod livers to decompose.

cod preserves = the island of Newfoundland (slang).

cod run = movement of cod to inshore waters in Newfoundland.

cod seine = a large seine net, up to 600 feet (182.8 m) in length, used to capture cod (*Gadus morhua*).

cod seine boat = a large, undecked fishing boat used to set and haul a cod-seine in the coastal fishery of Newfoundland.

cod seine crew = six or more men engaged to fish with a cod-seine under the direction of a seine master (Newfoundland).

cod seine fishery = the pursuit of cod with seines.

cod seine skiff = cod-seine boat.

cod sound = swimbladder of *Gadus morhua*.

cod smack = a vessel used in cod fishing.

cod stage = an elevated platform on shore on which cod are landed and processed before drying.

cod tongue = the tongue and hyoid apparatus of *Gadus morhua*. It has a glutinous, jelly-like consistency and delicate flavour when lightly fried, and may be salted.

cod trap = a pound net designed to capture cod. Consists of a net floor and walls in a box-like shape with a small opening on one wall called the doors. Leader nets running from the shore or a shoal directed the fish into the net.

cod trap berth = a place on the fishing ground where a cod trap is placed, the position assigned by lot.

cod trap crew = a group of 3-6 men working under a skipper on the share system to operate cod traps.

cod trap fishery =

cod trap linnet = twine knitted or made into meshes to form a trap.

cod trap season = the summer months when cod appear in schools in inshore waters of Newfoundland.

cod trap twine = hemp, cotton or nylon thread used in knitting or making a cod trap.

cod trap operator = 1) the captain of a cod trap crew.

cod trap operator = 2) operator of a boat which uses cod traps.

Cod Wars = a series of disputes between Iceland and Britain over the rights to fisheries off the coasts of the former country from 1958 to 1976. On three occasions, the Icelanders extended their territorial limits from 7 km to 19 km, from 19 km to 80 km, and then to 370 km (200 nautical miles). Nets were caught, rammings occurred and some shots fired. The limit was accepted when Iceland threatened to close the NATO base at Keflavik, an important defense against the Soviet Union in the Cold War (and Cod War may be a tabloid press play on words from Cold War).

cod whanger = a resident of Newfoundland involved in processing cod on shore.

cod worm = a parasitic annelid transferred to cod by seals.

cod's head = 1) the head of a cod (*Gadus morhua*) used as fertiliser or the fleshy part eaten as a delicacy (Newfoundland). See also codhead.

cod's head = 2) a type of woollen mitten (Newfoundland).

cod's head = 3) a stupid fellow (English slang).

cod-bag = a net in which cod were kept in the water until they could be loaded onto a vessel or towed ashore for processing (Newfoundland).

cod-banger = a vessel used in the cod fishery.

cod-bank = a submarine bank where cod are found and fished.

cod-chest = a chest in which cod are kept alive.

cod-chowder = a chowder with cod as its main ingredient.

cod-end = 1) the end of a trawl net which retains the catch and the part of the net where most size-selection takes place. In shape either cylindrical or tapering. Cod end mesh sizes and structure are usually regulated. From the Anglo-Saxon codd, a small bag.

cod-end = 2) a netting bag comprising one or more panels of the same mesh size attached together along their sides in the axis of a trawl by a seam where a side rope may also be attached.

cod-end knot = an easily released but secure knot opening the cod-end and releasing the fish onto the deck.

cod-fish = cod (1), and the usual form for naming this species in cultural works and the Newfoundland fishery. See also cod fish.

cod-fish weather = the foggy and chilly weather associated with the appearance of cod in coastal waters of Newfoundland in June and July.

cod-fisher = 1) a fisher for cod.

cod-fisher = 2) a vessel used in the cod fishery.

cod-fisherman = cod-fisher (1).

cod-fishery = fishing for cod, especially referring to a locally-organised fishery.

cod-hauler = nickname for a fisherman engaged in the Newfoundland cod fishery.

cod-man = a vessel used in the cod fishery.

cod-napping = the theft of the Sacred Cod of Massachusetts (*q.v.*) on 26 April 1933 by members of the Harvard Lampoon magazine, as a practical joke. It was later returned.

cod-oil = 1) an inferior cod liver oil used in leather manufacturing.

cod-oil = 2) cod liver oil.

cod-pitchings = the lowest quality of cod liver oil, formerly made by allowing cod livers to decompose.

cod-seine = a large seine net, up to 600 feet (182.8 m) in length, used to capture cod (*Gadus morhua*).

cod-seine boat = a large, undecked fishing boat used to set and haul a cod-seine in the coastal fishery of Newfoundland.

cod-seine crew = six or more men engaged to fish with a cod-seine under the direction of a seine master (Newfoundland).

cod-seine fishery = the pursuit of cod with seines.

cod-seine skiff = cod-seine boat.

cod-smack = a vessel used in cod fishing.

cod-trap = cod trap.

codder = a person or vessel engaged in the cod fishery.

coddling = fishing for cod.

Code = the International Code of Zoological Nomenclature, a system of rules and recommendations regulating nomenclature. The most recent version of the Code is the Fourth Edition published in September 1999 and taking effect on January 1st 2000.

coded-wire tag = a small (0.25 mm diameter x 1 mm length) wire etched with a distinctive binary code and implanted in the snout of a fish (usually a salmonid) for mark-recapture studies. Abbreviated as CWT.

codend gag = hauling leg (a wire rope extension of the halving becket joined to the lazy deckie (both q.v.). Also called bag becket leg, gagline and lazy deckie leg).

codend lashing = codline.

codend lift = 1) the part of a trawl containing fish hauled on board in a single operation.

codend lift = 2) the act of emptying the codend; usually involves several stages when the catch is large.

codfish = cod-fish.

codfish aristocracy = any pretentious, newly-rich people. Based on the Boston nouveau riche of the late eighteenth and early nineteenth centuries who made their money in the cod fisheries.

codfish ball = flaked salt cod and mashed potatoes.

codfish brick = pieces of salted dried cod compressed by mould into solid brick of about 1 to 2 lb weight (New England).

codfish cake = flaked salt cod and mashed potatoes.

codfish vertebrae = a medical condition in humans characterised by an exaggeration of the concavity of the upper and lower end plates of the vertebrae, as demonstrated radiographically in various types of thinning of the bone mass.

codge = a tangle in fishing lines.

codhead = a person from Fleetwood, Lancashire, a traditional fishing port. See also cod's head.

codland = the island of Newfoundland (slang). See also bacallaos and cod-preserves.

codlin = a small cod. See also codling.

codline = a rope closing the rear of a cod-end (sometimes also strengthening chafers). The knot can easily be loosened by hand or mechanically to let the fish catch out.

codling = a small cod. See also codlin.

codology = nonsense, the science of fooling someone. See cod.

Codpeace Foundation = an organisation set up in Newfoundland in 1979 in mockery of anti-sealing groups like Greenpeace and to support the "noble cod".

cods = 1) two or more cod (*Gadus morhua* or related fish).

cods = 2) testicles.

codswallop = nonsense, rubbish. Origin obscure and probably not connected to the cod (*Gadus morhua*). May be derived from a bottle with a glass marble in the neck invented by Hiram Codd and sold with mineral water - the slang for fizzy ale was wallop, hence codswallop.

coefficient of condition = condition factor.

coefficient of decrease = the ratio of number of deaths per unit of time to population abundance during that time, if all deceased fish were to be immediately replaced so that population does not change. Also called instantaneous rate of total mortality.

coeliac artery = a branch of the coeliaco-mesenteric artery (from the dorsal aorta) that serves the stomach, particularly the right side, and has branches serving the swimbladder and anterior dorsal mesentery (pneumatic artery), the liver (hepatic artery), the spleen (splenic artery), the enlarged proximal loop of the intestine and the intestinal diverticula (anterior intestinal artery), the straight posterior terminal portion of the intestine (posterior intestinal artery), and the dorsal surface of the ovary (ovarian artery)(the spermatic artery runs from the coeliaco-mesenteric artery to the left testis and from the gastric artery to the right testis).

coeliaco-mesenteric artery = a branch of the dorsal aorta that itself branches immediately into the gastric and coeliac arteries, *q.v.*

coelom = the fluid-filled abdominal cavity or body cavity containing the guts, gonads, kidneys, etc.

coelomic funnel = a ring-shaped peritoneal fold in female Salmonidae, for example, that guides the mature ova into the genital cavity from whence they exit to the exterior.

coeval = of the same age; existing or originating in the same time period.

coffee grinder = slang for a spincaster reel, *q.v.*

coffin = 1) a large container, often of stainless steel, used for storing large fish specimens in a museum.

coffin = 2) a box in which bluefin tuna are delivered to the Tokyo fish market.

cofilament = an angling line made of a core, low-stretch polyester and an outer layer of tough and flexible nylon. Less stretch than nylon monofilament and more sensitive to bites.

coggle = a small fishing boat.

coghel = a fishing net, generally an eel net, long and bag-like, narrowing to a point, and fixed on a hoop (Irish dialect). Also spelled cahill.

cognate = related through common ancestry.

cognomen = a working name or number used to label specimens thought to be a new species but not yet formally given a scientific name. Also called informal name, interim name, provisional name or taxon label.

cohort = a group of individuals of the same age recruited into a population at the same time, e.g. the 1999 cohort refers to fish age 0 in 1999, age 1 in 2000, etc. Also called age class, q.v.

cohort analysis = virtual population analysis (an algorithm for computing historical fishing mortality rates and stock sizes by age or length, based on data on catches, natural mortality, and certain assumptions about mortality for the last year and last age group. Assumes that, in a given time period, all fishing takes place instantaneously in the middle of the time period. Essentially reconstructs the history of each cohort or year class over its life in a fishery, assuming that the observed catches are known without error).

cohort replacement rate = the rate at which each subsequent cohort or generation replaces the previous one.

cohort slicing = a method used to assign ages to fish, given length measurements, e.g. used to convert catch-at-size data into catch-at-age data before the application of age-structured assessment models. Cohort slicing assumes that there is a one-to-one correspondence between length and age, i.e. the approach ignores individual variability in growth.

coil = 1) a Danish seine rope with 2½ leads and a length of 120 fathoms. Up to 20 coils may be set, linked by G-shaped hooks.

coil = 2) line or rope arranged in a circular pattern, and the act of arranging thusly.

coiled = said of the gut when it is convoluted in a regular, circular fashion.

coins = fish appear on various coins as they have long been important economically and symbolically.

coish = cosh.

colbert = where the backbone and bones are removed leaving the fillets attached to the head, usually in sole or whiting.

cold chain = the series of steps from capture through transport to preparation for eating where a fish is refrigerated to maintain its commercial viability.

cold fish = a person who is very reserved or aloof in manner or who lacks normal cordiality, sympathy, or other feeling; emotionless; a sexually frigid person.

cold marinade = acetic acid and salt as marinade in which fish are immersed without heat.

cold monomictic = said of a lake with a summer overturn and with a temperature never above 4°C.

cold resistance = the ability to survive temperatures below 0°C.

cold rooz = close the net, a word of command given in pilchard fishing (Cornish dialect).

cold seep = an area of the deep sea floor where cold water, rich in sulphides and/or methane, emerges, supporting bacteria and thus a food chain including fishes without sunlight.

cold smoking = salt cure fish smoked at less than 33°C to prevent cooking of proteins.

cold storage = fish stored well below the freezing point.

cold storage flavour = an unpleasant flavour and odour found in lean fish during frozen storage. Likened to wet dogs, to turnipy, leathery and carboardy odours (presumably in their wet states). The chemical involved is hept-*cis*-4-enal formed by oxidation of phospholipids. Not all people can detect this odour, about 10-15% being insensitive.

cold store flavour = cold storage flavour.

cold water = 1) water bodies characterised by summer temperatures not exceeding 20°C.

cold water = 2) the species found in water bodies characterised by summer temperatures not exceeding 20°C.

cold-smoked = said of fish that have been lightly brined and smoked at a low temperature; such fish must be cooked before consumption, cf. hot smoked.

coldkill = a mortality among marine fishes caused by a sudden drop in temperature.

coldwater disease = a bacterial disease of juvenile and yolk-sac fry of salmonids caused by *Cytophaga psychrophila* (or *Flexibacter psychrophilus*). It occurs at temperatures below 10°C and is an external and systemic disease with lesions on the fins skin and muscles, often concentrated on the caudal peduncle. Survivors may lose the caudal fin. Severe outbreaks leave fish lethargic and spinal deformities develop, or some fish may show spiral swimming, dorsal swelling and dark pigmentation on one side of the body; mortality is common. Also called peduncle disease or low temperature disease.

coldwater fish = fish found in waters of 20°C or less, optimally 4-15°C.

coldwater period = the stable period of water temperature of very late fall and winter to early spring.

coldwater pond = a pond for aquaculture where waters are 20°C or less.

coldwater *Vibrio* = a disease of farmed Atlantic salmon among others caused by certain *Vibrio* species active at temperatures below 10°C and producing muscular and myocardial degeneration. Red or bloody streaks appear on the body and fins and can lead to fin and tail rot with, in severe cases the tail and/or fins falling off. Also called red pest and Hitra disease.

colère = a breaded fish skinned, eyes, gills and fins removed, and the tail bent around into the mouth, e.g. in whiting.

coll. = abbreviation for collector (a person or institution who finds and secures specimens. Abbreviation often occurs on labels and is scientific descriptions of species. See also leg.).

collapse = reduction of a stock abundance by fishing and/or other causes to levels at which the production is negligible compared to historical levels. Normally used when the reduction is sudden. May be wrongly used to describe overfishing.

collar = 1) a ring of feathers or hair arranged immediately behind the head of an artificial fly.

collar = 2) collar bone.

collar boat = a small rowboat (Newfoundland).

collar bone = the bone at the shoulder of a fish that forms the leading edge of a belly flap, *q.v.*, in preparing fish as food. The collar is discarded when a fish is made into a steak or fillet but left on headless fish for sale because it helps retain the fish's shape. Also called lug bone, nape bone and shoulder bone.

collar day = the date on which sharemen and fisheries servants commence their voyage (1 May) (Newfoundland).

collar punt = collar boat.

collar time = spring, the period of preparation for the summer fishery in Newfoundland.

collateral type = any specimen, other than the primary types (holotype and paratypes), used in a species description.

collecting pool = a place where fish concentrate during the drying up or draining of a pond, usually behind the monk, *q.v.*

collection = 1) a permanent repository of preserved fish specimens available for scientific study and display.

collection = 2) a group of specimens with a common association such as geography or taxonomy.

collection = 3) the act of collecting fish for study.

collection and bypass system = a system at a dam that collects and holds the fish approaching the dam for later transportation or moves them through or around the dam without going through the turbine units.

collection manager = a person responsible for the care, maintenance, documentation, organisation, development and access to a collection.

collective group = an assemblage of nominal species that cannot be placed with certainty in known genera; names proposed expressly for collective groups are treated as generic names. Also applies to life stages such as eggs or larvae.

collective group name = 1) a name established expressly for a collective group. As collective groups have no type species their names cannot compete with other genus-group names for priority, but they do compete with them for homonymy.

collective group name = 2) a name established for a nominal genus or subgenus and later used for a collective group.

collective noun = a noun that denotes a collection of persons or things regarded as a unit. For ichthyology these include:-

army = herrings

battery = barracuda

bed = eels

bind = eels

bind = salmon

brood = dogfish

cast = fish

catch = fish

celebration = tuna (Richard Ellis, 2008)

cluster = porcupinefish

company = archer fish

cran = fish

draft = eels

draught = fish

draught = salmon

drift = fish

drought = fish

elongation = anglers

exaggeration = fishermen

family = sardines

**fleet** = bass

**float** = tunas

**flote** = fish

**flotilla** = swordfish

**flutter** = fish

**fray** = fish

**fry** = eels

**glean** = herrings

**glide** = flying fish

**glint** = goldfish (coined)

**grind** = blackfish

**haul** = fish

**herd** = seahorses

**host** = angelfish

**hover** = trout

**knot** = eels

**lap** = cod

**leap** = salmon

**leash** = trout

**nest** = fishes

**pack** = perch

**party** = rainbowfish

**pod** = billfish

**pod** = sailfish

**pod** = whiting

quantity = smelt

release = anglers (coined as a joke)

run = fish

run = salmon

scale = fish

scale = ichthyologists (coined as a joke)

scholl = fish

school = butterflyfish

school = salmon

school = sharks

shiver = sharks

shoal = barbels

shoal = fish

shoal = herrings

shoal = mackerel

shoal = minnows

shoal = perch

shoal = pilchards

shoal = roach

shoal = salmon

shoal = shad

shoal = sharks

shoal = sticklebacks

shoal = trout

spread = sticklebacks

steam = minnows

stream = minnows

swarm = dragonets

swarm = eels

swarm = minnows

take = fish

throw = fish

troop = dogfish

troop = tunas

troubling = goldfish

troup = trout

troup = tunas

warp = fish

wisp = eels

collective species = superspecies (a monophyletic group of allopatric species that are too distinct to be regarded as a single species; a cluster of incipient species (semispecies)).

collector = 1) a person or institution who finds and secures specimens. Abbreviated as coll. Abbreviation often occurs on labels and is scientific descriptions of species. See also leg.

collector = 2) a person who stores specimens including those not personally collected.

collector = 3) a boat used to transport live cod from a cod trap to a cod farm (Newfoundland).

collectotype = a joke name in nomenclature for specimen(s) in a private collection recognised by an expert as a new species but which the collector refuses to surrender for a formal description.

coller an eel = cooked eel pieces packed in a gelatin preparation. See also jellied eels.

colloquial name = 1) a common name, *q.v.*

colloquial name = 2) a locally used name for a species but one that would not be found in a general dictionary.

collum = an interruption in the sulcus acusticus of an otolith which marks the location of the nucleus.

Colombo cure = Indian mackerel gutted and cured in wooden barrels with salt and tamarind.

colonisation = the establishment (reproduction) of a species in an area not currently occupied by that species. Colonisation often involves dispersal across an area of unsuitable habitat.

colony = a protective grouping of spawning fish to protect young from predators.

Colorado blade = in angling, the basic rounded blade pattern of a spinner or spoon. Produces the most vibration and is good at night or in murky water.

coloration = combination of colour with pattern.

colour = 1) water may be coloured, affecting light penetration, plant growth and fish habitat. May be measured in colour units related to a standard.

colour = 2) fish have a characteristic colour depending of the type of commercial cure, e.g. light-salted fish have a yellowish cast, may show a slightly greenish cast and are translucent near the surface while green, heavy-salted fish are white to near white in colour.

colour = 3) fish have a variety of colours and colour patterns, varying with sex, season, developmental stage, trophic characters, lighting, behaviour, in water and out of water, etc.

colour enhancer = a chemical added to fish food; reputed to make the fish more colourful.

colour morph = a group of pigmented individuals, one of several such that may be fixed but also subject to individual change.

-colous (suffix) = to inhabit, inhabiting.

colt = a young seahorse (*Hippocampus* spp.).

column feeder = a fish that takes food in mid-water or near but not at the surface.

columna vertebralis = vertebral column (the vertebrae from the skull to the caudal fin, protecting the spinal cord and haemal artery and forming an attachment for muscles used in swimming).

columnar = column-shaped.

columnaris disease = a systemic and skin disease of young-of-the-year freshwater fishes caused by *Flexibacter columnaris* (or *Flavobacterium columnare*). Usually occurs in summer and is associated with stress, crowding, injury and poor water quality. Virulent forms may show no external symptoms, less virulent forms show grey-white lesions on the body, fins and gills. Lesions first appear on the caudal fin and progress to the head. Heavy infections appear yellow or orange. Scaleless fish show lesions comprising a dark blue area overlain by a milky veil and with

a red-tinged margin. See also saddleback, saddlepatch disease, mouth fungus and mouth rot, depending on locality on body.

colvert salmon = calvert salmon.

comb hook = hooks aligned on a bar and dragged along the bottom to snag bottom fishes.

*comb. nov.* = abbreviation for *combinatio nova*, meaning new combination.

*comb. rev.* = abbreviation for *combinatio revivisco*, meaning combination revived when a combination is reinstated , e.g. from an earlier synonymy.

combined live bearer = a reproductive guild (*q.v.*) with eggs having a large yolk volume and density (lecithotrophy) combined with feeding on sibling remains, histrotrophe and with simple placenta-like structures. Large specialised young are produced at parturition, e.g. *Latimeria chalumnae*.

combination = a scientific name comprising a genus group name followed by one or more names peculiar to the taxon.

combination vessel = a vessel capable of more than one type of fishing, e.g. longliner/dragger, midwater trawler/purse seiner, bottom trawler/purse seiner.

combination polyculture = aquaculture of fishes with vegetables, fruit trees, ducks, pigs, chickens, etc. in various combinations.

*combinato novum* = new combination. A new name results from a change in rank or position of an epithet from an earlier name, e.g. transfer to a new genus producing a new combination.

combined description = when a monotypic species description uses the same character states to describe both genus and species.

combined gill net/trammel net = gear set on the bottom made of a gill net, the lower part of which is replaced by a trammel net. Bottom fish are caught in the trammel net while semi-demersal or pelagic fish are caught in the gill net.

comfort zone = a fish species ideal environmental conditions, water temperature, oxygen, pH, etc.

*comm.* = abbreviation for *communicavit*, meaning (s)he communicated.

common of piscary = the right to fish in another man's waters (legal).

commensal parasite = a parasite which derives its substance from the food of its host.

commensalism = the close association members of different species which live together to the benefit of one without harm to the other, e.g. *Amphiprion* with a sea-anemone. See also symbiosis.

commercial abundance = commercial stock.

commercial catch = fishes caught by commercial fishing activities.

commercial extinction = fish stocks too rare to catch profitably.

commercial fish culture = aquaculture carried out for profit and/or socio-economic benefits.

commercial fishery = a fishery intended to harvest one or more species of fish for the purpose of selling them to fish buyers or directly to the public. Includes fisheries resources, fishermen, businesses related to harvesting, processing and sales.

commercial fishing boat = a boat used to earn a living by catching fish.

commercial harvest = commercial fishery.

commercial nape fillet = a fillet of fish with the belly flap removed, essentially boneless.

commercial size = minimum size that may be caught in a fishery.

commercial stock = that part of a commercial fish stock which could potentially be used by the fishery.

commercial yield = that part of the total fish stock which a commercial fishery could, or does, obtain.

commminuted = minced or fragmented fish flesh. It may be mechanically comminuted such that the type and form of the fish is no longer recognisable, or be fish fillets minced after removal of skin and bones, or disintegrated fish with some protein removed as in surimi (*q.v.*).

Commission = the International Commission on Zoological Nomenclature (ICZN). The duties and operation of the Commission are regulated by the Code (*q.v.*), and the powers and duties of the Commission are authorized by the International Zoological Congresses.

commissure = a site of union of corresponding parts, e.g. the jaw symphysis.

commodity = any fish which has value and is produced or gathered for consumption or sale.

common cardinal vein = the duct of Cuvier. The anterior cardinal vein returns blood from the head and the posterior cardinal vein from the trunk, joining together as the common cardinal vein (also called incorrectly the vitelline vein). The jugular vein from the lower jaw also empties into the common cardinal vein. The two common cardinal veins empty into the sinus venosus, *q.v.*

common of fishery = common of piscary.

common of piscary = the common law right of someone to fish in another person's waters.

common fishery = those fisheries not belonging to any state; the right to fish in all public waters, Compare free fishery and several fishery and, particularly, common of fishery.

common language = a language in use today as opposed to a classical one like Latin or ancient Greek used to form a scientific name. See also vernacular name.

common law right = in England, the right of access to the commons, including that of taking fish in tidal waters, dating from Magna Carta in 1215.

common name = the vernacular name of a species, varying from place to place, by language and over time. Scientific names, in contrast, are in Latin or latinised Greek world-wide and are subject to rules of usage that cannot apply to common names. Some common names of rare or deepsea species are artificial "book names" as these species are never seen by the general public. They are coined simply to provide a consistent format in books where common names are used or to provide a means of communication with people unfamiliar or uncomfortable with Latin names. Official common names are an attempt to standardise usage and some countries have recommended lists. The Latin or scientific name provides accurate identification and should be used at least once in any article to fix the identity of the species being discussed. Of course, popular articles will use names without reference to official lists and restricting the common name to one choice loses diversity, cultural significance, history, etc. See also name.

common pool resource = a natural resource (e.g. a fishery) that is difficult to divide up or control such that the take by one person affects that of another.

common property resource = a fishery resource owned by the public and regulated by the government. Not the same as open access since regulated.

*communicavit* = (s)he communicated.

community = 1) the different species of fish kept together in an aquarium. Certain species thrive while others cannot be kept together because of predatory behaviour, aggressiveness, different environmental requirements, etc.

community = 2) a group of organisms in a given place and at a given time, at different trophic levels, and implying known or assumed relationships between the organisms (in contrast to an assemblage, *q.v.*).

community development quota = allocation of a portion of a catch to small communities which then form partnerships with large fish companies to harvest, process and market their share of the catch, e.g. along the Bering Sea shore of North America.

community fishery = fishing activity exerted in public or communal waters generally designed to meet community needs. May involve different levels of community involvement and participation.

community stage = a waterfront facility erected to serve the common needs of fishermen for landing and handling of a catch (Newfoundland).

compactor = a storage system where shelving or other storage units are mounted on rollers and tracks and moved together to minimise space and apart for access. Often used to store specimens in museums.

companion cell = a Sertoli or follicle cell enveloping the cysts of spermatogenic cells in the testis.

company = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for archer fish.

company and fish stink after three days = guests should not outstay their welcome.

compatible = said of fish species that can live together without mutual harm, whether in aquaria, aquaculture or nature.

compensation = 1) management activities that replace all or part of fish stocks or their habitat lost through development or other activities.

compensation = 2) mechanism by which the effect of one factor on a population tends to be counteracted or compensated for by a consequential change in another factor, e.g. compensatory growth, reduction in egg production may be compensated for by an increased survival rate of eggs.

compensation = 3) the maintenance of an appropriate physiological rate in the face of temperature change.

compensation depth = the depth at which oxygen production by photosynthesis is balanced by respiratory uptake (usually correlated with the depth at which light is 1% of its incident intensity). This is the lower limit of the photic zone below which there is no net plankton growth.

compensatory growth = an increase in growth rate shown by fish when their populations fall below certain levels. This may be caused by less competition for food and living space.

compensatory survival = a decrease in the rate of natural mortality that some fish show when their populations fall below a certain level. This may be caused by less competition for food and living space.

competing name = one of two or more scientific names that are available or legitimate that must be taken into consideration when determining the correct name for a taxon.

competition = the detrimental interaction between two or more organisms of the same or different species which utilise a common resource (excludes predation).

competition index = a measure in the change in yield in aquaculture when raising several species together rather than a single one.

competitive exclusion = two species cannot coexist when they have identical needs of a limited resource, one is excluded, the species that is the poorer competitor.

competitive release = the expansion of a species' ecological niche, associated with the lack of competition with other species.

competitive total allowable catch = a total allowable catch (TAC), q.v., under which participants are not allocated a portion of the total catch limit but the catches from all participants are summed to ensure that the sum of all catches does not exceed that TAC.

complemental male = the small, usually degenerate (except for gonads) male which lives attached to the female, e.g. some Ceratioidei. Also and less preferably called parasitic male.

complementary distribution = two taxa occupying adjacent geographical areas with little or no overlap.

complementary fish = a freshwater fish, often diadromous and belonging to marine groups which become dominant in freshwater faunas only in paucity or absence of primary, secondary, and probably also vicarious freshwater faunas, e.g. *Agonostomus*, *Joturus*, *Cestraeus*, *Sicydium*, *Sicyopterus*, *Stiphodon*, certain New World Gobiesocidae.

complemented survey = an angling survey using two or more contact methods.

complete = whole, entire, having all its elements, e.g. a complete lateral line runs from the head to the base of the tail and generally all scales in the line are pored.

complete diet = in aquaculture, a diet that satisfies all the nutritional requirements of a fish.

complete fertiliser = in aquaculture, a fertiliser with a full or complete complement of the necessary elements (especially nitrogen, phosphorous and potassium).

completed trip interview = an interview in an angling survey conducted as the angler finishes fishing.

complex = 1) a group of closely related species that have yet to be adequately described and distinguished.

complex = 2) a group of closely related species which are not easily distinguished although named.

complex life cycle = a life cycle that consists of more than one stage, e.g. ammocoete and adult.

complexing = items that add complexity to a stream channel, altering flow and providing shelter for fish , e.g. rocks, vegetation.

composed hook = a hook consisting of several pieces, usually natural material such as whalebone, mother-of-pearl, tortoiseshell, thorn, horn, wood, etc.

composite = the use of two or more materials in constructing a fishing rod, usually carbon fibre and fibreglass.

composite fish culture = aquaculture of two or more fish species that are compatible but have different feeding habits.

compound = a word or scientific name formed from two or more words combined excluding prefixes and suffixes, e.g. *novaehollandiae*.

compound epithet = an epithet formed from two or more words.

compound feed = a fish feed composed of several ingredients.

compressed = flattened from side to side, e.g. Chaetodontidae, Embiotocidae. Opposite to depressed.

compressed pellet = a type of fish feed formed by forcing steam-conditioned ingredients through a die under pressure. Less durable than expanded and extruded pellets.

compressiform = flattened from side to side, compressed. Usually fish having a body depth at least one-third of standard length (length without tail fin). Opposite to depressiform.

con- = together, with, joint, e.g. conspecific.

concave = curved in, e.g. a fin in which the middle rays are shorter than the outer. Opposite to convex.

concealment = methods used by fish to hide from predators and prey, e.g. counter shading, vegetal colouration, camouflage.

conceit net = a fishing-net inclined upwards and fixed by poles, enclosing a portion of a tidal river or bay (Scottish dialect).

concentrate = in aquaculture, a feed that is low in fibre and high in total digestible nutrients.

concentration phase = a stage in the life cycle of a fish at which the individuals are particularly concentrated, e.g. spawning in streams, marine fish larvae in surface waters.

concept, hypothetical = a taxonomic concept that when published contained no animal then known to exist in nature, past or present, but only in the mind of the author whether a prediction or not.

conch = a large sea-shell used to signal the arrival of bait fish in inshore waters of Newfoundland.

concholin(e) = a protein concentrated in the opaque zone of otoliths causing the dark appearance of this zone.

concoctotype = an unofficial term in nomenclature for a complete holotype made from several incomplete specimens.

condensed fish solubles = a thick syrup (40-50% solids) produced during fish meal manufacture. May be marketed as such or added back to the press cake before drying. Also called stick water.

conder = [huer](#) (formerly a sentry on a high cliff, pointing out pilchard schools (reputedly by waving a small bush) in Cornwall to seine netters. Also called balker, herring caller).

condition = the nutritional status of a fish or the amount of flesh on a carcass, varying with reproductive status and feeding. A measure of plumpness and general health.

condition coefficient = a figure calculated from length and weight which expresses the plumpness or fatness of a fish or the changes in the food reserves stored in muscle. The condition factor (K) is the ratio of the weight of the fish (without the gonads) to the cube of its length ( $K = W/L^3$ , where w = weight in grams less the weight of the gonads and L = standard length in mm). A coefficient factor (C) can similarly be calculated using the English system with total length in inches and weight in pounds. Conversion from C to K may be made using the formula  $C = 36.1 r^3 k$  where r = the ratio of standard length to total length. Low K values indicate a fish in poor condition while fish at sexual maturity will typically have a high K. Also called condition factor, condition index and coefficient of condition.

condition factor = condition coefficient.

condition index = condition coefficient.

conditional = 1) of a proposed scientific name which is made with strong reservations about its status.

conditional = 2) of the inclusion of a taxon in another taxon at a higher rank, made with stated reservations.

conditional fishing mortality rate = the fraction of an initial stock which would be caught during the year (or season) if no other causes of mortality operated (Ricker, 1975). Also called annual or seasonal fishing mortality rate. Abbreviated as m or *m*.

conditional natural mortality rate = the fraction of an initial stock that would die from causes other than fishing during a year (or season), if there were no fishing mortality (Ricker, 1975). Also called annual natural mortality rate, seasonal natural mortality rate.

conditionally suppressed name = in nomenclature, the older of two names considered as subjective synonyms which may still be used when either the taxa denoted by the names are regarded as distinct or it is the valid name of a taxon subordinate in rank to, and included in, the taxon denoted by the later name, e.g. a subgenus within a genus.

conditioning = 1) keeping young fish in a confined space so that the gut is emptied.

conditioning = 2) keeping fish in a confined space so that they become accustomed to it or to other environmental variables.

conditioning = 3) preparing adult fish in aquaria for spawning, e.g. feeding live foods, raising the water temperature, changing the light regime, changing the water, etc.

conditioning = 4) softening frozen fillet blocks slowly so that fish fingers or fillets can be made from them without damaging and losing parts of the block.

conductivity = the ability of water to pass an electric current as determined by the negatively-charged anions (chloride, nitrate, sulphate, phosphate, etc) and the positively-charged cations (sodium, magnesium, calcium, aluminium, iron, etc). Temperature also affects conductivity, rising with increased temperature. Measured in micromhos (mho) or siemens (S). Used as a general measure of water quality.

conduit spring = freshwater spring where the water has flowed through large subsurface openings.

condyle = the articulating, rounded surface of a bone, e.g. the occipital condyle is the surface of the skull articulating with the atlas vertebra.

condyli = plural of condylus.

condylus (plural condyli) = condyle.

condylus occipitales = occipital condyle (see above).

cone of vision = the area above, below, in front and behind a fish which it can see.

confamilial = confamiliar.

confamiliar = belonging to the same family.

*confer* = compare (with). Abbreviated as *cf.*, *cfr.*

*conferre* = *confer*.

confluence = 1) the meeting or junction of two or more streams or the place where these streams meet.

confluence = 2) the stream or body of water formed by the junction of two or more streams; a combined flow.

confluent = 1) joining another smoothly, flowing into another, e.g. dorsal, anal and caudal fins in Zoarcidae.

confluent = 2) a stream which unites and flows with another.

conformer = an organism which has a physiological state identical to and varying with the environment, e.g. for most fishes, body temperature is the same as the water.

confused name = a name based on heterogenous elements from which it is not possible to select a lectotype (*nomen confusum*).

congeneric = belonging to the same genus. Congeneric applied to generic names usually implies that the names refer to the same taxon, i.e. synonymous genera.

congenital transmission = transmission of a pathogen at the time of gamete release.

congener = a member of the same genus.

conger = 1) *Conger* is a genus of marine eels (Congridae).

conger = 2) a term of abuse (in Shakespeare's Henry IV, part II).

conger cuddling = a fund-raising game for the lifeboat in Lyme Regis, England where two teams try to knock each other off six-inch high wooden blocks using a dead conger eel suspended from a rope. The eel is usually about 5 feet long. A derivative of mangel dangling where a mangel-wurzel is used to knock people off the blocks.

conger douce = conger doust.

conger doust = the conger (*Conger conger*) dried and powdered for making fish soup (Cornish dialect).

conger head = a term of abuse.

conglomerate = gathered into a mass, e.g. fish eggs.

congruence sign = ( $\equiv$ ) used to indicate objective synonyms (q.v.) in nomenclature.

conical = cone-shaped.

conjoined = coming together to touch or overlap.

connective tissue = any animal tissue with much dead, secreted material between the cells, e.g. ligaments, fibrous tissue, blood, bone, cartilage, fat.

connectivity = the movement of organisms from place to place through dispersal or migration.

conner = to fish for the wrasse *Tautogolabrus adspersus* (Newfoundland).

connivent = converging; said of nostrils in some balitorid loaches.

conodont = the problematical small tooth-like fossil of the Cambrian, Silurian and Devonian periods which could well be a tooth of Cyclostomata.

cons. = abbreviation for *conservandum*, meaning to be conserved.

consecutive hermaphrodite = a protandrous or protogynous hermaphrodite, q.v., where either the male or the female sexual organs become functional first followed subsequently by the other one.

*conservandum* = to be conserved. Abbreviated as *cons*.

conservation = 1) in the museum context, maximising the usefulness and endurance, and minimising the deterioration, of specimens.

conservation = 2) the science of examining and treating museum specimens and the study and improvement of their museum environment in order to safeguard them.

conservation = 3) the planned management of natural resources.

conservation = 4) the act of conserving (see conserve).

conservation pool = a pool in a reservoir maintained at times of low water to conserve fish stocks.

conservation storage = storage of water for later release, e.g. for power generation, irrigation, municipal water supply.

conservator = a person trained in the preventative care, maintenance and restoration of museum specimens and in the research on methods to do this.

conserve = to set aside or modify any provision of the Code, *q.v.*, so as, e.g. to preserve or permit the use of a name as a valid name by removing the obstacles to such use, to preserve the use of a name in a taxonomic sense that would otherwise be incorrect, or to deem a work to be published or available despite its not satisfying the normal criteria. In each case conservation is by a ruling of the Commission using its Plenary Power.

conserved name = a generic or family name that is retained by authorization of the International Commission on Zoological Nomenclature by the use of its Plenary Power although strictly it contravenes the Code (*nomen conservandum*).

conserved type = a name conserved with a particular nomenclatural type. Also called *typus conservandus*.

conserved work = a work (i.e. a publication) that the International Commission on Zoological Nomenclature has ruled to be an available work.

conservotype = a joke term in nomenclature for a type described so that it will have the status to be listed as an endangered species.

consexual = of the same sex.

conspecies (noun) = two or more species belonging to the same genus.

conspecific (adjective) = belonging to the same species, conspecific subspecies are subspecies belonging to the same species. Conspecific applied to species names usually implies that the names refer to the same taxon, i.e. synonymous species.

constructed hook = composed hook.

consummatory behaviour = a feeding behaviour where the food item is taken into the mouth, tasted and then accepted or rejected.

consumer surplus = the difference between the amount consumers would be willing to pay for fish and the amount they actually pay.

consumptive harvest = total number or weight of fish that are caught and retained in a fishery over a time period.

consumptive use = activities such as fishing, which remove parts of the resource.

consumptive wildlife use = consumptive harvest.

contact method = any method used to contact anglers for a survey, e.g. mail, email, telephone, door-to-door, roving, aerial, access, etc.).

contact organ = the dermal bony outgrowth or spicule projecting from a fin ray or scale margin and surrounded by the epidermis through which bony outgrowths may protrude. Present in those parts of the body and fins of the male which come in direct contact with the female during the spawning act. May be tactile in function. Found in 9 families of 3 orders: Cypriniformes, Atheriniformes, and Scorpaeniformes (Wiley and Collette, 1970).

container = a receptacle that holds a specimen(s) and its preserving fluid, e.g. a vial, bottle, jar, tank.

container list = a list of materials in a container, used to facilitate retrieval and especially useful for large tanks that are not as visually accessible as glass jars where both a label and the fish specimen can be seen.

contaminant = any substance present in a fish product and originating from outside sources. The contaminant affects the safety or quality of the product. Contaminants can be environmental or from processing and include chemicals and various foreign bodies.

contemporary evolution = directional selection as human activities change ecosystems. In fisheries, size limits on catches restrict fishing to the larger specimens. In Atlantic cod, for example, this has led to maturity at smaller sizes and, since smaller fish produce less eggs, this hinders recovery of the stock. Arguably, catches should be restricted to medium-sized fish, allowing young to grow to catchable size and for some to survive to be very large and reproductively effective.

contiguous fishery zone = the area seaward from the territorial limits.

continental margin = the zone, generally consisting of shelf, slope and rise, separating the continent from the abyssal plain or deep sea bottom.

continental rise = the area of gently sloping sea bottom between the base of the continental slope and the abyssal plain at 2000-5000 metres.

continental shelf = the area of gently sloping sea bottom from the shore out to a depth of about 200 metres. It may be only a few kilometres offshore where the sea floor descends rapidly to great depths or may be extensive and form an accessible habitat for many commercial fishes.

continental slope = the steeply sloping sea bottom from 200 to 2000 metres (or 100-300 m to 1400-3200 m) and 3-6°C. Average angle of slope is 4° with a maximum about 20° near the upper margin.

continuity = the principle that a continuity of usage of a name should take precedence over strict priority of publication in determining which of two or more competing scientific names should be adopted.

continuity, principle of = uniformitarianism (the present is the key to the past. The physical and biological factors which link today's variations must have been in operation in the past).

continuous = unbroken, uninterrupted; used to refer to a lateral line without a break or a dorsal fin with the spiny and soft portions joined.

continuous breeder = a fish that may breed at any time of the year.

continuous culture = aquaculture where the larger fish are removed continually, and young fish continually stocked, rather than the whole pond being drained and re-stocked (batch culture).

continuous fishing = removal of fish from a net such as a trawl by pumps, rather than hauling the net onboard, or the continual removal of fish from the neighbourhood of an attractant like light or an electrode.

continuous smoking = a process of smoking fish where they are loaded and unloaded without interruption.

contortotype = a joke term in nomenclature for a badly twisted or dried type specimen.

contour pond = an aquaculture pond on sloping ground.

contra- (prefix) = opposite, against.

contralateral = opposite side. Opposite of ipsilateral.

contranatant = swimming or migrating against the current; movement of adults towards the spawning area. Opposite of denatant.

control dam = a dam with gates to control water flow from an upstream reservoir or lake.

control date = the date established for defining the pool of potential participants in a given management programme for a fishery, e.g. control dates can be a range of years in which a participant must be active in the fishery to qualify for a quota share.

control rule = a protocol for specifying harvest rates in relation to stock status and limit and target reference points. A harvest strategy expected to result in a long-term average catch

approximating the maximum sustainable yield. Also called decision rules or harvest control laws.

controlled access = a chart showing the number of fish caught in certain categories, e.g. weights. A cumulative frequency distribution shows the number in a category, plus the number in previous categories. See also limited entry.

controlled drift = fishing while drifting with the current or wind but using oars or motors to effect greater control.

controller = a device which measures some parameter of an aquarium, and then switches on and off another device to affect the aquarium. Typical controllers include redox, and pH.

controls = various measures that managers impose to regulate fishing; may be effort controls or catch controls, depending on what they intend to regulate.

conus arteriosus = a chamber in the heart, *q.v.* It leads blood out of the heart to the ventral aorta.

conveniotype = a joke term in nomenclature for a type that still has its distinguishing characters to be established.

conventional tag = any marker used to identify an individual fish, e.g. tags, dyes, disks, flags, etc.

convergence = 1) evolution of similar characters in unrelated taxonomic groups, in cladistics a synonym of parallelism, e.g. fin-like structures in fishes and whales.

convergence = 2) the meeting of ocean currents or water masses with different physical properties (temperature, salinity, density) with the result that colder, saltier or denser water sinks, or the line or area where convergence occurs.

convergence = 3) deep cell movement toward the dorsal side of the embryo during the gastrula and early segmentation periods.

convergence zone = the line where two oceanic water masses meet.

convergent evolution = convergence (1).

conversion efficiency = a measurement of fish growth as a %, equal to  $G/R \times 100$  where G is the specific growth rate and R is the ration in % weight of body weight per day.

conversion factor = a multiplier to convert landings into nominal catches. These factors vary with the species involved and with the whether the fish are fresh, frozen, gutted, etc. May also vary by country and over time.

conversion rate = an index in kilogrammes of the amount of food needed to produce one kilogramme of fish.

converter smack = a vessel used for both trawling and drifting.

convex = curved outward, e.g. a fin in which the middle rays are longer than the outer rays. Opposite to concave.

convoluted = twisted, coiled.

co-occurring stocks = different stocks of fish that swim near one another and may be caught together.

co-ordinate = of names or categories within a given group that are of equal nomenclatural status.

Cook and Traganza method = a means of estimating the original fresh weight of all fish from archaeological remains. All bone is weighed and multiplied by a factor to give total edible weight. The original factor was 20 based on the observed ratio of dead bone to fresh weight. This was increased to 40 since some bones could have been thrown away, carried off by animals or used for other purposes. See also White's method.

cooked marinade = a marinade where the fish are preserved by acid and salt content and also by heat or pasteurisation.

cookie = a disk of rubber strung on a wire or chain to protect the trawl net from abrasion and to stir up mud and scare fish into the net. May be stamped out from tyres.

cool water = 1) water bodies characterised by summer temperatures of 20-24°C.

cool water = 2) the species found in such waters.

cooler = cooling tub.

cooling tub = a wooden container or half-barrel used for washing fish (Newfoundland).

cooling water = water used for cooling canned fish; has a chlorine residual of 2 p.p.m.

coolwater fish = fish species living in relatively cool waters, optimally 10-21°C.

coop = 1) a circular and wickerwork trap used in, e.g. Ceylon, narrowing from a five foot circumference at the bottom to an arm's width. A light is used to attract and distract the fish over which the coop is plunged and extracted via the narrow end. See also fish-coop.

coop = 2) a hollow vessel made of twigs with which fish are caught on the Humber River, used to take eels.

coop = 3) a large trap net made of stakes or a fence.

cooperative = a jointly owned organisation furthering the catch, processing and sale of fish. Abbreviated as fish-coop (pronounced co-op).

coordinate name = a family, genus or species group name; names within the groups have equal status. See Principle of Coordination.

coordinate status = said of names subject to the Principle of Coordination (*q.v.*).

Cope's Rule = size tends to increase during phylogeny.

Copenhagen jar = a wide-mouth glass container with a snap-on polyethylene lid. Also called Danish jar.

coprolites = fossilized faeces. Those of some sharks for example may be recognized because of the distinctive form produced by the spiral intestine.

copropel = a mixture of plant fragments, algal remains, spores, pollen, aquatic arthropod fragments, grains of sand, etc.

coprophagy = feeding on faecal material.

copula = 1) dermal bone(s) overlying the basihyals.

copula = 2) united basibranchials in sharks.

copular plate = the tooth plate on the basibranchials of Cetomimidae.

copulin = a substance secreted by male *Poecilia reticulata* which reportedly triggers growth of the ovipositor in females and synchronizes their oestrus cycles. Further studies by other investigators do not support these findings.

copyist's error = an incorrect spelling made in copying, not intended by the original author.

Coquitlam = a town in British Columbia whose name derives from "smell like fish" or "stinking of fish slime" in the Halkomelem language. Local Indians sold themselves into slavery during a famine and while preparing salmon for their masters became covered in fish slime.

COR = abbreviation for coronal pore.

coracle fishing = the use of a pair of coracles to catch fish. The coracle is mainly a Welsh boat shaped like half a walnut shell, with a shallow draught, difficult to manoeuvre but light enough to be carried. Each fisherman uses a paddle with one hand and handles the net spread between the coracles with the other. When a fish is trapped in the net, each fisherman pulls up his end of the net and the two coracles are brought together and the fish is secured.

coracoid = the lower, paired endochondral bone on which the pterygials or actinosts of the pectoral fin rest. Dorsally it has a notch which, with a similar ventral notch on the scapular, frames the scapular foramen. It attaches anteriorly to the cleithrum.

coracoid bar = coracoid cartilage.

coracoid cartilage = a U-shaped bar comprising the ventral part of the pectoral girdle in Elasmobranchii, supporting the pectoral fins.

coral = 1) the rocklike deposits consisting of the calcareous skeletons secreted by various Anthozoa. Coral deposits can form reefs or islands in warm seas and are major habitats for fishes.

coral = 2) fish eggs or the egg-filled ovary, having a grainy texture.

coral fish disease = gold dust disease (an infectious disease caused by dinoflagellates evidenced by a golden or brownish dusty appearance on the fish skin through mucus production. The fish may show irritability, flashing, respiration difficulties and clamping of the fins. A very contagious and often fatal disease in aquaria. Called velvet disease when *Oodinium* (or *Piscinoodinium*), coral fish disease when *Amyloodinium*, and also rust from the appearance).

coral rock = consolidated material, greater than 3 cm in diameter, made of fragments of dead coral and which may include cemented sand, coralline algae and sedimentary rocks, Used in the aquarium trade. See also live rock.

corallivore = a feeder on corals, e.g. parrotfishes (Scaridae) which are important agents of marine bioerosion and sand formation.

corallivory = coral feeding.

corallophile = coral loving, in the sense of species limited to coral reefs, e.g. *Scarus coeruleus*, *Acanthurus coeruleus*, *Pomacanthus arcuatus*.

corange line = a line passing through places of equal tidal range.

cordate = heart-shaped.

core = the area surrounding the primordia of a otolith and bounded by the first prominent D-zone. Salmonidae have multiple cores.

core area = 1) the area of habitat essential in the breeding, nesting and rearing of young, up to the point of dispersal of the young.

core area = 2) the central and most highly protected part of a protected area.

core fish = undried salted cod (Newfoundland). See also corved.

corf = a basket used for taking fish (obsolete).

corf-house = a house or shed erected for the purpose of curing salmon, and for keeping nets in, during the close season (Scotland).

corft = fish boiled with salt and water.

coriaceous = having a leathery texture.

corium = the dermis, the lower skin layer.

cork = float (a plastic, cork or wood device that enables a baited hook to be suspended in the water column and enables fish biting on the hook to be detected by movement of the float. Usually painted distinctively, e.g. fluorescent colours, particularly at the tip. Floats are attached to the fishing line through small holes at the bottom of the float or by means of silicone tubes slipped over the float with the line trapped between the tube and float. Split shot or some other weight is attached to the line below the float so that the line sinks and the float achieves a suitable level above the water and is sensitive to bites. Bites may be evidenced by the float zooming underwater, by wiggling movements, by a slight rise as a fish picks up bait off the bottom, and other subtle movements. Strikes can be made immediately the float moves or delayed to give the fish time to take in the bait - this varies with bait type, species of fish and sophistication of the individual fish. Immense number of types and materials used, some with carbon fibre stems and tips or heavy and stable lignum stems. Also called bobber in North America or waggler in Britain).

corkline = the top line of a net that has cork floats for support.

cormorant fishing = the use of tame cormorants (*Phalacrocorax* spp.) to catch fish, originating in China and also seen in Japan, Korea and other parts of Asia, and, later, as a hobby in Europe. The cormorant wears a ring around the neck to prevent large fish being swallowed and disgorges the fish on its owner's boat. Small fish may be swallowed despite the ring. Up to 150 fish an hour can be caught by a cormorant. The cormorant may be attached by a rope to the fisherman in the boat or may be free-diving. James I and Charles I of England had a Master of the Cormorants but this was more of a sporting venture than for serious food gathering. See also bird fishery.

cornea = the thin and transparent anterior part of the sclera, *q.v.*, of the eye allowing light to fall on the retina for vision.

corned alewife = washed and lightly-salted alewife (*Alosa pseudoharengus*) without guts, packed in salt in barrels.

corner = the angle formed by any two walls of a cod trap (Newfoundland).

corneous = in reference to keratinised epithelium.

cornification = conversion into horny tissue; hardening.

cornified = corneous.

Cornish duck = a pilchard (*Sardina pilchardus*, Clupeidae).

[Cornish sardine](#) = a pilchard (*Sardina pilchardus*, Clupeidae). In Britain pilchards are regarded as somewhat inferior food although the juveniles, called sardines, *q.v.*, are popular. The name Cornish sardine was invented as a marketing ploy in 2003 and increased the sale of pilchards ten times. The name is now a Protected Geographical Indication, *q.v.*

cornobbled = hit with a fish. Note some sources state it means an itch, anything causing one to fidget, or anxiety. Joseph Wright's English Dialect Dictionary (1898-1905) gives the definition as "to beat on the head" and other sources suggest that the original was "hit with a fist" which got mis-transcribed at some point.

cornua = plural of cornus.

cornus (plural cornua) = a horn-like projection, usually from the head area and used in osteology.

coronal commissure = the branch of the head canal sensory system extending across the top of the head between the eyes joining the two supraorbital canals.

coronal head spine = a spine on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

coronal pore = the dorsal median pore of the cephalic lateral line system (*q.v.*) at the point of juncture of the branches from each supraorbital canal. Abbreviated COR.

coroner of the seas = Receiver of Wreck (a British government official concerned with shipwrecks and their legitimate ownership. Also tasked with disposing of Royal fish, *q.v.*

coronoid = a paired dermal bone bearing teeth located on the upper edge of Meckel's cartilage. One pair is found in Acipenseridae and two pairs in *Amia* and *Lepisosteus*. Also called presplenial, splenial, prearticular and intradentary.

coronoid process = a dorsal hump on the dorsal wing of the dentary, or on the angular or on the posterior end of Meckel's cartilage.

coronomeckelian = a small bone on the postero-lateral part of Meckel's cartilage of the lower jaw. Often a point of insertion of the adductor mandibulae muscle. Also called sesamoid angular, supraangular, sesamoid articular, articular sesamoid, splenial, os meckeli or *d* bone.

corpus = 1) body; used in anatomical descriptions or to any solid part of an organ.

corpus = 2) that portion of the stomach next to the oesophagus (as opposed to the pylorus next to the intestine). A term preferred over "cardiac" region.

corpus cerebellum = cerebellum.

corpuscles of Stannius = the bud-like evagination(s) from the wall of the pronephric duct anterior to the opisthonephros (Holostean) or in the posterior region of the opisthonephros (Teleostean) in the kidney. Function unknown according to some, said to be that of parathyroid glands of other vertebrates, which are lacking in fishes. This organ secretes hypocalcin (teleocalcin) to regulate calcium metabolism.

*corr.* = abbreviation for *correctus*, meaning corrected (by).

corral = an enclosure formed of nets supported on poles; fish are trapped in the enclosure when the tide falls because of the narrow, v-shaped entrance.

corral fish culture = a pen made of a frame of bamboo, sticks, twigs or similar materials stuck in the bottom of a shallow lake with netting strung on these materials.

corre fish = core fish.

corrected name = *nomen correctum* (a corrected name or 'improved' name, an available name which is a mandatory and allowable emendation of an imperfect name or of a taxonomic name higher than family (which is not subject to name form and ending regulations). Does not depend on transfer in taxon rank or assignment (an emended name).

*correctus* = corrected (by). Abbreviated as *corr.*

corrie loch = tarn (a small mountain lake, often occupying a cirque or corrie).

corrigenda = plural of corrigendum.

corrigendum (plural corrigenda) = a note published by an author, editor, or publisher of a work, expressly to cite one or more errors or omissions in that work together with their correction.

corroboration = a term used in age determination studies where two people agree on the numbers of annuli or two different structures give the same results.

corrugated = having a surface of parallel and alternate ridges and grooves.

corselet = scaly armour or enlarged scales behind the pectoral fin in some Scombridae.

corved = undried salted fish, cod or herring.

Corynebacterial disease = bacterial kidney disease (a bacterial infection with *Renibacterium salmoninus* or *Corynebacterium* sp. affecting salmonids, usually when temperatures are falling. The disease may be chronic or acute and has no treatment. Causes swelling of internal organs (oedematous, grey and corrugated kidneys with off-white lesions) and haemorrhages. Lesions may occur also in the liver and spleen and muscle contractions occur. External symptoms may be absent or include exophthalmia, skin darkening, abdominal swelling, and skin ruptures and vesicles. Also called Dee's disease and kidney disease).

cosh = a river estuary cut off from the sea at low tide (Newfoundland). Also spelled coish.

cosmic fish = a symbol of the whole of the physical universe.

cosmine = a form of dentine covered by a layer of enamel and with clusters of dentinal tubules which open to the surface pores and lead into flask-shaped cavities. The cavities are connected by canals (the "pore-canal system"). Enamel may or may not penetrate and cover all or a part of the inner surface of the pore cavity. The pore-canal system has been suggested to

house an electrosensory organ but there is no clear evidence of this (Bemis and Northcutt, 1992).

cosmoid scale = scale with four layers, an outer, thin, porous layer of vitrodentine (sometimes denticulate or lacking denticles, adenticulate), a middle layer of dentine with pulp cavities or canals (cosmine), a spongy deeper layer of loose spongy bone containing osteoblasts, and lastly a laminar layer of isopidine with osteocytes and Sharpney's fibres. Grows by adding to inner layer only, e.g. Crossopterygii, Placodermi; not found in extant fishes.

cosmopolitan = occurring in all the oceans or all the continents (excepting usually Antarctica, or the Arctic and Antarctic Oceans).

coassack = a form of salmon trap used in Scotland on rivers. The entrance comprises two light doors or leaves which the swimming motion of the fish pushes open, and these leaves close behind the fish.

costal = pertaining to a rib.

costiasis = an infection of the skin, fins and gills of aquarium and hatchery fish by the flagellate protozoan *Costia necatrix* (or *Ichthyobodo*; and also *Chilodonella*, *Trichodina*). Found in young fish just as they start feeding externally, in colder waters. Stress may be a factor. Fish may show lethargy, appetite loss, flashing, respiratory distress in the form of gill flaring and gasping, fin erosion, and produce abundant mucus, giving a cloudy appearance, hence the other names blue slime disease or skin slime disease. The skin and scales may peel away in strips in acute cases.

costiform = rib-shaped.

costule = a short, vertical ridge on the inner and/or outer tooth crown base in Chondrichthyes.

cotidal line = a line on a chart or map passing through places having the same tidal hour.

cotriade = a Breton stew of several species of fish with potatoes usually poured over toasted French bread. Does not contain shellfish like bouillabaisse (*q.v.*).

cottoid bubblemorph = a large space under the skin in larvae of the Liparidae; it may help to maintain buoyancy.

cotton seed cake = a cake or compressed pellet of the seeds of *Bombyx malabaricum*, the Indian cotton tree used as fish feed.

cotton wool disease = a fungal disease caused by *Saprolegnia* sp. and *Achylya* sp. Appears as fluffy, whitish growths often at the site of an injury or diseased part of a fish. The fungi may turn grey to reddish-brown over time owing to dirt or algal accumulation. Can prove fatal if untreated as it will spread to healthy tissue. Occurs, for example, on salmonid gills and mouth, and on fins it is called fin rot. May also attack fish eggs, especially those that are infertile or damaged, but it may spread to healthy eggs (parental care fishes usually pick out infected eggs and broadcasts spawners usually have the eggs widely dispersed). Stress, chilling, old age and poor aquarium husbandry all contribute to this disease. Mouth fungus and columnaris disease

(*q.v.*) have a similar appearance and may be called cotton wool disease but are bacterial diseases.

cotyle = an articulation in the form of a rounded pit. Also called cotylus.

cotyloid = cup-shaped.

cotylus = cotyle.

cotype = obsolete term for either syntype (*q.v.*) or paratype (*q.v.*), not recognised by the International Code of Zoological Nomenclature.

coulee = a streambed or stream, often dry in summer, or a deep ravine with a stream also often dry (U.S.A.).

count = the number of items in a fixed weight or volume when marketing fish. The product is sorted and packaged by count ranges. Size ranges have such names as small, large and jumbo which need not be the same in all markets even though size grades will be harmonised.

count-it-down = countdown method.

countdown method = estimating the depth at which to start retrieving and fishing a lure by counting as the lure sinks. Special lures are designed to be used with this method. Also called count-it-down.

counter-current heat exchange = exchange of heat between blood vessels going to surface structures with vessels going deeper into the body. This exchange preserves core body temperatures and reduces surface heat loss so that the fish can function more effectively in cool waters or penetrate cooler waters not otherwise favourable.

counter-illumination = having bioluminescent organs that are concentrated on the ventral surface so as to increase the effect of countershading, *q.v.*

countershading = condition of fish in the water column that are dark-colored on top but light-colored on the bottom. The effect is to obscure the image of the fish to predators by blending with the dark sea floor when viewed from above, the light sky when viewed from below, and with the general diffused pattern of light when viewed from the side.

country of harvest = in food inspection, the country from which the fish species comes.

country fishery = all the fisheries of a country. May be used for a fishery by native groups.

country food = fishes forming a significant part of the diet of native people, caught locally by traditional or modern methods but not commercially packaged and sold.

country mile = an informal measurement of distance, usually longer than the statute mile (1760 yards or 1609 metres) or straight distance of one mile, as it can involve winding roads or rough terrain. More a measure of traveling time than distance, being the time needed to cover a

certain portion of a route between two places. Still used in some countries to the confusion of the metrical scientist. See also farsakh.

country of origin = the country where a species is native.

coup = a basket used to catch salmon (Scottish dialect). Also spelled coupe, cowp, and cowpe.

coupe = coup.

couplet = a pair of contrasting descriptive statements; used in identification keys to give a choice leading to a species identification or to the next couplet.

courge = a basket hung on the side of a se-fishing boat, used to keep bait and fish alive (English dialect).

course = the path over which something moves as in water in a river (watercourse).

course-bag = in the Newfoundland Bank fishery, a container from which lots are drawn assigning areas for dories to fish.

court = fish court (the holding chamber in a trap net or the last chamber in any net).

court bouillon = court-bouillon.

court-bouillon = a stock of salt water, black pepper, spices, herbs, vegetables, vinegar and white wine used in cooking fish. Court means short in the sense of not rich, and generally the bouillon (thin broth) is not served as part of the finished dish.

cove = a small, sheltered indentation in the shore of lake or sea.

covel = a half-barrel or tub with handles or rope affixed to the sides or with holes for inserting a staff for two men to carry in Newfoundland.

cover = 1) any materials placed in a water body to create fish habitat, spawning and nursery areas.

cover = 2) natural items such as weeds, logs, overhanging banks, boulders, roots, etc. providing shelter for fishes.

cover bait = plugs and other lures designed for use in heavy cover.

cover net = castnet.

cover pot = a wide-mouth basket with a smaller hole in the opposite end, plunged into the water over a fish spotted by a wading fisher, the fish being caught and extracted by hand through the smaller hole. Often used in turbid water or areas of rich plant growth. See also fish dance (2). Also called plunge basket. See also lantern net.

covering bone = dermal bone (any of the the superficial bones in Teleostomi derived from the dermis and overlying the deeper elements of the skull. Primitive fishes have more dermal bones than higher ones, e.g. the armour of Ostracodermi. Dermal bones are a form of membrane bones, i.e. they arose directly from connective tissue membranes without the cartilaginous precursors which precede endochondral bones. They may be divided into laterosensory canal bones that develop in relation to the sensory canals, bones derived from mesenchymous tissue and anametic bones (*q.v.*). Also called achondral, membrane and investing bones).

cow = an egg-laden sturgeon.

cowble = coble (2).

cowell = cowl (2).

cowl = 1) fish bladder (Cornish dialect).

cowl = 2) a fish basket carried on the back (English dialect).

cowl-net = a large hand-net used in salmon poaching (Yorkshire dialect).

cown = a basket for catching fish.

cowp = coup.

cowpe = coup.

CPR = abbreviation for catch, photograph, release.

CPUE = catch per unit effort.

CPY = current potential yield.

CR = critically endangered.

cracken = crackin.

crackin = the refuse of fish liver after oil has been extracted (Scottish dialect). Also spelled cracken and cracking.

cracking = crackin.

cradle = a device to hold a fish while the hook is extracted, the fish measured and weighed, or photographed. It consists of two long poles with a soft mesh between them. The fish is cradled in the device while still in the water so that stress and injury is lessened.

craft = 1) a group of boats (there is no plural, "crafts").

craft = 2) fishing gear (Newfoundland).

craft liftnet = a framed liftnet which is placed on the bottom of a water body, baited, and then hauled to the surface rapidly at intervals to secure a fish catch.

craiging = a tradition where the first fish brought into a boat had its neck broken, some blood squeezed out and then rubbed over the hands (Scotland).

Crail's capon = a dried haddock (*Melanogrammus aeglefinus*, Gadidae). See also capon.

craive = cruive.

cran = 1) an old unit of measure for fish such as herrings by volume (ca. 37.5 Imperial gallons or 170.5 litres) equivalent to about 750 fish or over 1000 fish (sources differ). 5.5 crans is 1 metric tonne. May now be used informally to indicate a volume of fish weighing one hundredweight (112 pounds or 50.8 kg).

cran = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

crania = plural of cranium.

cranial = 1) pertaining to the skull.

cranial = 2) to the direction of the skull.

cranial endothermy = maintenance of elevated temperatures of the eyes and brain in fishes that move from warm to cold water on migrations. This condition is thought to stabilise vision, e.g. in lamnid sharks, billfishes, mackerel and tunas.

cranial nerves =

Nerve	Motor (M) or Sensory (S)	Origin	Function
0 Terminal (Preoptic)	S	Telencephalon; ventral border of olfactory bulb	Smell? and sensory endings of snout
I Olfactory	S	Telencephalon; anterior end of olfactory bulb	Smell
II Optic	S	Diencephalon; optic lobes	Sight
III <u>Oculomotor</u>	M	Mesencephalon; posterior ventral end of medulla between optic lobes and	All eye muscles but lateral rectus and superior oblique

		cerebellum	
IV <u>Trochlear</u>	M	Mesencephalon; dorso-lateral anterior surface of medulla	Movement superior oblique muscle
V Trigeminal	MS	Mesencephalon; anterior lateral border of medulla oblongata	a) sensory to snout, conjunctiva, cornea, iris, ciliary body (ophthalmicus); b) sensory to upper jaw and snout (maxillaris); c) sensory to lower lip and teeth, motor to mastication muscle (mandibularis)
VI <u>Abducens</u>	M	Metencephalon; anterior ventral end of medulla oblongata	Lateral rectus eye muscle and retractor bulbi muscles in part
VII Facial	MS	Metencephalon; lateral border of medulla oblongata just posterior to trigeminal and with acoustic	Motor to muscles of hyoid arch (hyomandibular); sensory to geniculate ganglion, sensory to taste bud system; sensory to lateral line organs of snout
VIII Acoustic	S	Myelencephalon; with facial from lateral border of medulla oblongata	Sensory to equilibrium, hearing, acceleration
IX Glossopharyngeal	MS	Myelencephalon; posterior lateral border of medulla with vagus	Motor to third visceral arch; sensory to pharyngeal area and posterior tongue region; sensory to lateral line components of posterior head region
X Vagus (Pneumogastric)	MS	Myelencephalon; posterior lateral border of medulla with glossopharyngeal	Sensory to pharynx, oesophagus, thoracic and abdominal viscera. Pharyngeal musculature, visceral musculature. Trunk lateral line. Visceral arches behind third. Respiratory movement.

craniobuccal pouch = Rathke's pouch (an embryonic invagination of the stomodeal ectoderm (roof of the embryonic mouth) which migrates dorsally to come into contact with diencephalon. It differentiates into the anterior pituitary gland or adenohypophysis. It becomes a blind naso-hypophyseal canal in some Agnatha or develops secondary opening to the outside with or without a connection to the mouth).

cranium (plural crania) = the skull.

crank = the technique in angling used to retrieve a plug, either a deep-diving one or a shallow one, continuously reeling in the lure to give it its proper action.

crankbait = an imitation fish or plug designed to dive when retrieved (or cranked) slowly, usually having a lip at the front, larger lips giving deeper dives.

crap = crop.

crape = creep.

crappen = crappin head.

crappie-doo = a ball of oat meal mixed with chopped onions and seasonings and boiled in fish stock (Scottish dialect).

crappin head = crappit head.

crappit head = heads of haddocks or cod stuffed with a compound of oatmeal, suet, onions and pepper. See also crappen and crappin head and variant spellings using k instead of c.

crate = wooden container in which cod are processed in the Newfoundland Bank fishery.

crateriform = having the form of a shallow bowl.

cravat = a fillet tied in a knot.

crave = cruive.

craw-pockies = the eggs of sharks and skates (Orkney Islands dialect).

crawler = a surface lure that is designed to have the appearance of crawling across the water surface when retrieved.

crease = 1) the area where fast and slow water meet, often with fish in the slower water next to the crease conserving energy and picking up food as it passes in the faster flow.

crease = 2) a depression containing the backbone which is left in a cod when it is split (*q.v.*) (Newfoundland).

creasing = an increase in the number of meshes to alter the shape of a net.

crèche = a congregation of unrelated young, often under the care of some parental fish.

credit water = fish credit water (water set aside in reservoirs for release downstream to maintain fish stocks).

creek = 1) a small fast-flowing stream. A creek is smaller than a river and larger than a brook, but actual dimensions are relative according to locality and usage varies. Often pronounced "crik" in North America.

creek = 2) or a small bay or inlet of the sea.

creel = 1) a basket-like structure used for carrying angling gear and caught fishes, usually and traditionally made of wicker.

creel = 2) the number and kinds of fishes caught in a day.

creel = 3) a wicker trap for catching fishes (and crayfishes).

creel census survey = creel survey.

creel survey = the estimation of anglers' catches, usually by a sampling program involving interviews and inspection of individual catches on a particular stream, lake or other area; a survey of the recreational fishery that quantifies the fish landings at public piers and docks. Components include type of fishing, time of fishing, time spent, species caught, size, catch per unit effort, waters fished, baits and gear, etc.

creeler = a fish worthy of putting in a creel.

creep = dragging the sea bed for lost nets with a grapnel or creeper.

creeper = a grapnel, a device with one or more hooks for grasping or holding. Used for searching out lost lines or drawing up night lines for eels.

creeve = cruive.

credit system = the arrangement in which a fisherman is supplied by a merchant with supplies and gear against the season's catch (Newfoundland). Also called truck system.

credit time = the period of preparation for the summer fishery (Newfoundland).

crenal = adjective for crenon. Also spelled krenon.

crenal zone = an area of headwater springs.

crenate = margined by small, rounded scallops.

crenated = 1) margined by small, rounded scallops.

crenated = 2) shrunken.

crenicolous = living in springs or streams fed by springs.

crenobiont = organisms found in springs and spring brooks.

crenocoae = the biotope and biocenosis of a crenal zone.

crenon (adjective crenal) = strictly the organisms in an area of headwater springs but also used in the sense of crenal zone.

crenophile = an organism preferring spring environments but may also occupy similar habitats.

crenulate = minutely crenate or scalloped.

crenulate scale = a scale intermediate in form between a ciliate and a ctenoid scale, e.g. in characoids.

crep = to strike an anchor on the bow head of a skiff on moonless nights, thus startling fish which could be seen by phosphorescent trails (Scottish dialect).

crepuscular = relating to dawn or dusk, often used in the sense of when a species is active.

crescentic = shaped like the moon in the first or last quarter.

crest = a ridge; a median bony or fleshy ridge on the upper surface of the head.

Cretaceous = a geological period of the Mesozoic Era ca. 140-65 million years ago. Abbreviated as K.

crevicular = inhabiting crevices.

crib = 1) a fish shelter placed in lakes lacking sufficient cover for bait fish and smaller sport species. May be built of logs in a cabin shape and then filled with brush. Can be towed into position and sunk or built on ice in northern lakes and left to sink in spring.

crib = 2) a solid structure of logs, rocks and other materials used to support a stream bank, bridge, road, etc.

crick = creek.

cricket can = a container used to keep crickets alive when used as bait in fishing.

crickotype = an unofficial term in nomenclature for a holotype and only known specimen that has been ground up for DNA analysis.

crimp = 1) crimp sleeve.

crimp = 2) a cruel manner of cutting up fish alive, used by London fishmongers in the past to render the flesh firm. Once a favourite dish among epicures.

crimp sleeve = a small cylinder of metal used in angling for making connections in wire or very heavy monofilament line; the sleeve is crimped with pliers.

crimping = transverse slashes across the flesh of fish being sold to prevent toughening when rigor mortis sets in.

crisp = fish crisp (a delicatessen product made from fish mince mixed with starch and sugar, expanding when cooked in oil and not like a potato chip).

crista (plural cristae) = crest.

crista ampullaris = a ridge at the bottom of the ampullae, the widening in the base of the semicircular canals of the inner ear. This ridge bears sensory epithelia.

crista inferior caudae = the crest or ridge extending along the ventrolateral surface of the tail region (behind the anus) in Syngnathidae.

crista inferior trunci = the crest or ridge extending along the ventrolateral surface of the trunk in Syngnathidae.

crista media trunci = the crest or ridge extending along the midlateral surface of the trunk in Syngnathidae.

crista neglecta = macula neglecta or crista quarta, q.v.

crista occipitalis (plural cristæ occipitales) = occipital crest (a vertical blade on the occipital bone formed from ossification of the connective septum separating occipital myomeres).

crista quarta = macula neglecta (a sensory structure located in Teleostomi in the utriculus of the inner ear near the opening of the ampulla of the posterior vertical semicircular canal, in selachians within a duct (posterior canal duct) through which the posterior vertical semicircular canal connects with the sacculus, while in the batoids it lies in the wall of the sacculus adjacent to the opening of the duct. It may have a neuromast associated with its sensory tissue. This structure has been demonstrated to be a sensitive vibration receptor in *Raja*. Also called crista neglecta or papilla neglecta.

crista superior caudae = the crest or ridge extending along the dorsolateral surface of the tail region (body behind the anus) in Syngnathidae.

crista superior trunci = the crest or ridge extending along the dorsolateral surface of the trunk of Syngnathidae.

cristae = plural of crista.

cristate = having comb-like ridges or crests.

cristiform = crest-shaped.

critch = crutch.

critical age = the average age of the fish in a year-class at which the instantaneous rate of natural mortality equals the instantaneous rate of growth in weight for the year-class as a whole. At this age, the biomass of the age class is maximum.

critical depensation level = level below which a stock or population cannot sustain itself even in the absence of harvest.

critical flow = 1) minimum flow needed to prevent fish deaths.

critical flow = 2) very high flows impeding fish migrations.

critical habitat = a habitat crucial to the life cycle of a fish, e.g. spawning area, nursery area.

critical period = supposedly the time in larval life when yolk is exhausted and there may be high mortality through starvation.

critical size = the average size of the fish in a year-class at the time when the instantaneous rate of natural mortality equals the instantaneous rate of growth in weight for the year-class as a whole (Ricker, 1975). Also called optimum size.

critical standing crop = when natural food is fully utilised for maintenance and maximum growth of fish.

critical stock = a stock of fish experiencing production levels that are so low that permanent damage to the stock is likely or has already occurred.

critical thermal maximum = in fish exposed to a constant rate of heating, the temperature at which there is a loss of equilibrium or onset of muscle spasm. Abbreviated as ctmax.

critical thermal minimum = in fish exposed to a constant rate of cooling, the temperature at which there is a loss of equilibrium or onset of muscle spasm. Abbreviated as ctmin.

critical velocity = a flow through which fish will not swim.

critically balanced = a fishing rig where the bait is counterbalanced by a small weight near the hook so the bait only just floats above it.

critically endangered = in the IUCN Criteria for threatened species, a taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future. Abbreviated CR.

critter cam = a camera attached to an organism, e.g. a shark, recording picture, sound, temperature, depth, etc., allowing the daily life of fish to be studied in real time.

criv = cruive.

crive = cruive.

cro = croy.

croakwood = horn-like devices which make a hollow, croaking sound when thrust into the water. Used to attract the European wels, *Silurus glanis*, through a similarity to frogs croaking or to the sounds made by female wels.

crock = a large glass or ceramic container, usually cylindrical, and used for preservation of fish specimens in a museum. The glaze of ceramic crocks is penetrated by preservatives over time and the seal is often poor. Replaced with stainless steel containers and lids.

crockuns = remains of fish livers after the oil has been extracted (Scottish dialect).

croffis = cruive.

crooked as a barrel of fish hooks (very dishonest).

croos = a dumpling filled with fish liver (Shetland Isles).

croove = cruive.

crop = 1) to supply a fisherman from a merchant with personal equipment, supplies or fishing gear against the profits of a voyage (Newfoundland).

crop = 2) crop note.

crop = 3) yield (1) catch in weight. Catch and yield are often used interchangeably. Amount of production per unit area over a given time. A measure of production. The sustainable yield is the quantity of fish which can be taken from a stock (usually on an annual basis) without severely depleting or eliminating that stock). crop note = a merchant's chit authorising personal equipment, supplies or fishing gear to a fisherman against profits from the voyage (Newfoundland).

cropping moggie = the liver of a cod mixed with flour and spice, and boiled in the fish's stomach (Shetland Isles dialect). See also liver moggie, liver muggie and livered moggie.

cropshen = herring refuse, headless and broken fish, gills, eyes, intestines, etc. Once made into compost (Norfolk dialect).

croquette = a patty of at least 35% fish and/or crab, mixed with breadcrumbs or another binding material.

cross cut fillet = a flatfish fillet where the flesh from each side is removed as a single piece.

cross pile = to make a rectangular pile of dried cod with each layer at right angles to the one below (Newfoundland).

cross-over point = junction of two threads in knotless netting.

cross-row of scales = the diagonal scale row (the almost vertical rows of scales slanting backwards and downwards across the sides of the body. Divided into scales above the lateral line starting at the front of the dorsal fin (from, but not including, the scale in the middorsal row, to but not including, the lateral line scales) and below the lateral line similarly ending at the front of the anal fin. The number of transverse rows themselves along the body may also be counted).

cross-sectoral issue = an issue where the actions of one sector affect one or more other sectors. Habitat degradation is an important cross-sectoral issue for fisheries.

crossbar = a vertical pigmentation, usually referring to one on the base of the tail.

crossbreeding = reproduction between two distinct conspecific gene pools, e.g. between evolutionarily significant units (ESUs). Note that hybridization refers to reproduction between distinct species or higher taxa.

crossfish = not a fish but another name for starfish (Echinodermata).

crosshanded = a single fisherman on board a vessel who fishes with jigs or handlines.

crosshanded dory = a dory so rigged that one man could handle it and fish (Newfoundland).

crossing over = cutting over.

crotch trolling = use of stick to throw a bait out without a fishing rod. A reel is used to retrieve the line. Used by poachers as there is no rod to attract attention (Norfolk).

crove = cruive.

crowd = a fishing crew as an organised group (Newfoundland).

crowding externality = the effect of one fisherman's catch of a species on another fisherman's catch of the same species, cf. stock externality.

crowis = cruive.

crown = 1) the top of the head, or of other anatomical structures like teeth.

crown = 2) an enamel tooth part.

crown = 3) a shoal area on a fishing ground (Newfoundland).

Crown Brand = an official mark on barrels of pickle cured herring packed in Scotland and northeast England to indicate that contents conformed to regulations governing size, condition and cure. No longer in use but some terms still used to describe various products:- large full = full of milt or roe and not less than 11½ inches long; full = full of milt or roe and not less than 11½ inches long; matfull = full of milt or roe and not less than 9½ inches long; medium= maturing or filling fish not less than 9½ inches long and with the long gut removed; and mattie = not less than 9 inches long and with the long gut removed.

crown group = all the taxa descended from a major cladogenesis event, recognized by possessing the clade's synapomorphy.

crownfull = a certain quantity of herrings (Shetland Isles dialect).

croy = a semi-circular enclosure or pen, made on the beach, for catching fish on the falling tide (Scottish dialect).

crucial habitat = habitat that is basic to maintaining viable populations of fish during certain seasons of the year or specific reproduction periods.

crucifix = 1) a Christian symbol (†) used before the name of an author to indicate (s)he died before publication or, in an ongoing website with several authors, that this contributor is deceased. Also called a dagger.

crucifix = 2) in a synonymy, used to indicate a misidentification. Also called a dagger.

crucifix = 3) a footnote marker. Also called a dagger.

crucifix fish = *Ariopsis felis* (hardhead sea catfish, Ariidae) head skeleton sold as having attributes of the crucifixion of Jesus Christ. The arrangement of bones on the ventral surface of the head resemble a crucified person, a section looks like the shield of a Roman soldier, another section looks like a Roman sword and, when shaken, a sound like dice being cast is heard, reminiscent of Roman soldiers gambling for Christ's garments. The sound is presumably loose otoliths.

cruciform = 1) having the form of a cross.

cruciform = 2) x-shaped (incorrectly).

crude density = the number of individuals in an area.

crudo = raw fish or sashimi, Italian-style.

crue = a wickerwork fish trap.

cruiser = a migratory fisherman catching cod from a schooner on the Labrador coast.

cruising = in angling, used for fish looking for food.

cruising speed = extended swimming by fish without stress or fatigue.

cruive = a fish trap made by enclosing a space in a river, traditionally with wicker or wood (English dialect). Also spelled criv, craive, crave, crove, croove, crowis, coffis, cruve and crive.

crumble = food particles compounded artificially as fish food, of a certain size for ingestion and made not to disintegrate in water.

crumenal organ = bilaterally flattened pair of somewhat angular pouches or purses involving the last two gill arches and the anterior oesophagus whose posterior origin is supported by the fifth ceratobranchial and the posterodorsal tip of the fifth epibranchial (bones of the gill arch) which are united by special accessory cartilage in the Argentinoidei (Argentinoidea and Alepocephaloidea). Food particles are trapped dorsally in the pouches by large interlocking toothed gill rakers.

cruncheons = scrunchins (pieces of fish liver after the oil has been removed (Newfoundland). Also spelled scrunche(o)ns, scrunchings or scrunchions).

cruppy-dow = a cake made of oatmeal and fish (Northumberland dialect).

crura = plural of crus.

crus (plural crura) = the functionally distinct anterior lobe of the pelvic fin in Rajiidae. It has three flexible joints and is used to push skates off the bottom, enabling them to glide a short distance.

crus commune = that part of the inner ear where the vertical canals meet.

cruisie = an iron basket filled with knobs, resinous fir roots, burned to give light for poaching fish (Scottish dialect).

crutch = a forked structure fastened to side of boat to hold the head of a net or cod trap above water (Newfoundland).

crutching = a form of fish locomotion which is hesitant, using the pectoral fins in a manner similar to that used by humans on crutches, e.g. in mudskippers and frogfishes. Also called amphipedal progression.

cruve = cruive.

crux herring = a class of herring for curing. Caught on or after 14 September (Exaltio Crucis).

cry stinking fish = belittle one's own goods; to foul one's own nest.

cryal = adjective from cryon. Also spelled kryal.

cryocoa = the biotope and biocoenosis of a cryal zone.

cryal zone = the area of a glacial stream or river, or a sea ice community .

cryo- (prefix) = pertaining to cold, cold.

cryogenic freezing = blast freezing, *q.v.*, accelerated by using liquid nitrogen or carbon dioxide sprays at -150°F or less. Used for individually quick frozen products (*q.v.*).

cryon (adjective cryal) = the organisms of a glacial stream or sea ice community.

cryopelagic = at or near the water surface under ice.

cryophilic = association with temporary or permanent ice.

cryoprotectant = chemicals such as sucrose and sorbitol that can be added to fish muscle before freezing to prevent adverse chemical reactions. Usually added to surimi (*q.v.*) before it is made into blocks and frozen.

crypsis = hidden, concealed, camouflaged. Often used in terms of colour or fringes and flaps used by fishes to conceal themselves from predators.

cryptic = adjective for hidden, concealed, camouflaged. Often used in terms of colour or fringes and flaps used by fishes to conceal themselves from predators.

cryptic biomass = the fraction of the stock that is unavailable to a fishery.

cryptic introduction = an undocumented introduction of a species to a drainage to which it is not native.

cryptic species = 1) those valid species that are morphologically indistinguishable but reproductively isolated. Also called sibling species.

cryptic species = 2) species names in the literature that have not been used for long periods of time.

cryptocaryon = a ciliated protozoan parasitic infection of marine fishes in aquaria caused by *Cryptocaryon irritans*. White spots develop on the body and fins and fish will scratch themselves against rocks. Gills may become infected and respiration affected. Also called white spot disease.

cryptodepression = a lake basin with its deepest parts below sea level.

cryptogenic = of obscure or unknown origin, e.g. a species may be an exotic or a native but little is known of its natural distribution and no conclusion can be made.

cryptophilic = loving concealment.

cryptotype = 1) an unofficial term in nomenclature for a type published in an obscure place such as a newsletter or non-scientific magazine.

cryptotype = 2) an unofficial term in nomenclature for a type from a private collection that was not labelled as such.

crystal flash = a trade name for synthetic material available in string shapes and used in streamer (*q.v.*) patterns to add flash and colour.

crystal waggler = a transparent plastic waggler, *q.v.*, supposedly less visible to fish.

crystallised otolith = an otolith displaying inadequate calcification making age determinations difficult if not impossible due to missing annuli.

ctenactinia = plural of ctenactinium.

ctenactinium (plural ctenactinia) = the curved rod-like clasper on the posterior side of the priapium in Phalostethidae.

ctenidia = plural of ctenidium.

ctenidium (plural ctenidia) = microscopic tooth-like structure or a row of spines, e.g. in Poeciliidae.

ctenii = plural of ctenius.

ctenius (plural ctenii) = small spines or denticles on scales, usually most evident on the posterior margin but sometimes covering the whole scale. The scales are termed ctenoid scales on this basis. Each ctenius consists of a base and a spine. Also used for bony combs along the pelvic fin rays of some fishes. Also called spinules.

ctenoid scale = a scale having small spines (ctenii) on the posterior exposed portion and which hence feel rough when stroked towards the head. Typical of many Teleostei.

ctenus = incorrect spelling of ctenius.

cubbag = a small bag of leather used for carrying bait or fish (Caithness dialect).

cube = bite (a small piece of fish breaded or coated with batter, weighing less than 1 oz. Of various shapes such as round, square, or irregular. May be cut from regular blocks or blocks of minced fish. Generally sold by count, 25-35 per lb. Also called nuggets, petites, and tidbits).

cubic centimetre = 0.0338 fl oz, 0.00211 pt, 1.0 mL. Abbreviated as cm<sup>3</sup>.

cubic foot = 957.5 fl oz, 59.84 pt, 28.317 mL, 0.0283 m<sup>3</sup>. Abbreviated as ft<sup>3</sup>.

cubic feet per second = 28.317 L/s, 7.841 gal/sec. Abbreviated as ft<sup>3</sup>/s.

cubic metre per second (m<sup>3</sup>/s) = rate of discharge, typically used in measuring streamflow. One cubic metre per second is equal to the discharge in a stream of a cross section one metre wide and one metre deep, flowing with an average velocity of one metre per second.

cuckoldry = in nest building fishes, a male that is not the parental nest-guarder fertilises some eggs. Sneaker males dart out from hiding while satellite males mimic females to gain access to the nest site.

cuckoo-fish = upside-down catfishes (*Synodus multipunctatus* and *S. petricola*, Mochokidae) in Lake Tanganyika that lay their eggs at the same time as mouth-brooding Cichlidae. The cichlids pick up these catfish eggs along with their own but the catfish eggs hatch more quickly, being smaller, and the young feed on the cichlid's eggs.

cue = a stimulus, e.g. temperature is often a spawning cue.

cuesta = a ridge with a steep slope on one side and a gentle slope on the other.

cul du canard feather = fine, downy feathers from the rear end of duck used in fly-tying. There are few of these on each duck and they have a natural flotation because they are impregnated with preen oil.

cull = 1) the removal or killing of selected fish in a breeding stock or a group of fry, to improve overall quality.

cull = 2) removal of poor quality fish products by inspectors.

cull = 3) removal of damaged or duplicate specimens from a museum collection or lot.

cull = 4) releasing smaller fish caught in a contest as larger ones are taken when there is a limit in number of fish eligible for prize winning.

cull = 5) the lowest commercial grade of cod in the Newfoundland fishery.

cullage = the inferior fish from a cull.

culler = a person who sorted dried and salted cod into grades by cure, quality and size (Newfoundland).

culling board = a wooden table, or even simply a plank, used for sorting and grading dried, salted cod in Newfoundland.

culprit worm = an artificial plastic worm with a ribbon tail, originally manufactured by a company of that name.

cultigen = a species or subspecies cultivated by humans and not occurring naturally.

cultivation of ponds = agricultural usage of dried-out ponds so as to improve their productivity when used again.

cultrate = with a knife edge.

cultriform = knife-shaped.

cultural eutrophication = enrichment of the nutrient load of water bodies by human activities. Contributes to deterioration of the life-supporting features of the water body.

cultural keystone species = a fish that has major significance in the lives and traditions of a group of people, e.g. eulachon (*Thaleichthys pacificus*, Osmeridae) in the Pacific northwest to the Nuxalk. See also grease trail.

culture = the artificial breeding and raising of fish.

culture-based capture fishery = capture fisheries which are maintained by stocking with material raised within aquaculture installations.

culture-based fishery = supplementing or sustaining stocks beyond the natural level. May include introduction of a new species, stocking, habitat improvement, removal of undesirable species. Often used in the sense of stocking hatchery-reared juveniles into the natural environment for recapture when grown.

cultured stock = a stock that depends upon spawning, incubation, hatching, or rearing in a hatchery or other artificial production facility.

culturist = a person engaged in aquaculture.

*cum* = with. Abbreviated as *c.*

cumulative catch limit = cumulative limit.

cumulative limit = the total allowable amount of a species of stock that can be taken over a set time. Usually measured in weight that a vessel can take and keep, possess or land. The vessel or fisher can take or land as much fish as they like as long as they do not exceed the cumulative limit during the designated time period.

cumulative catch limit stacking = cumulative limit stacking.

cumulative limit stacking = the association of cumulative limits with permits rather than vessels. A vessel with multiple limited entry permits can harvest multiple cumulative limits. Also called permit stacking.

cund = to show which way a school of fish has gone (archaic).

cuneate = wedge-shaped.

cuneiform = wedge-shaped.

cuneiform area = the thickened wedge-shaped area on the dorsum of the caudal appendage ventral to the proximal portion of the Batoidean sting (spine). The glandular epithelium of the cuneiform area is believed to produce venom.

cuneiform bone = rocker bone (a prominent, median, bean-shaped bone in Ophidiidae and Carapidae which is drummed against the anterior end of the gas bladder for sound production).

cup = a kind of fishing-net or trap (English dialect).

cuprinol = a copper naphthenate solution used as a preservative on nets.

cupula = a gelatinous rod or flap enclosing the sensory hairs of the neuromast cells in the acoustico-lateralis system (trunk and head lateral line and inner ear). Sometimes called cupula terminalis.

curation = the identification and organisation of museum specimens according to a set system and in accordance with the scientific literature, thus adding to scientific knowledge.

curator = a person responsible for a collection of organisms, for carrying out research on them, for increasing and improving that museum collection and for exhibiting the materials to the public.

curd = 1) a creamy material covering the surface of canned salmon and tuna produced from previously frozen fish. It is coagulated, denatured protein formed during poor cold storage prior to heat processing and is considered unsightly, reducing marketability.

curd = 2) thick slime on the exterior of spoiled fish.

cure = preserving fish by salting, smoking, fermenting, drying or pickling, or any combination of these.

curing = 1) preserving fish as food by smoking, salting, drying, fermenting, acid curing and various combinations of these. Often removes moisture from the fish to retard bacterial growth but is now used to give a pleasant flavour and refrigeration is used to prevent or retard decay.

curing = 2) processing of cod-liver oil (Newfoundland).

curio = any rare, unusual or curious article. In the fish world, various items have been curios in the past and some, to the detriment of conservation, today, e.g. dried seahorses and pipefishes, shark jaws, puffer fishes and porcupinefishes in an expanded state, sawfish saws, Jenny Hanivers (*q.v.*), fur-bearing trout and furfish (*q.v.*), crucifix fish, etc. Sharks, seahorses and porcupinefishes are the three marine fish groups most traded in the U.S.A. which imports about one million fish annually as curios worth more than \$1.7 million.

current = 1) a part of a body of water moving in a definite direction.

current = 2) in general circulation or use; in progress.

current annual yield = the one-year catch that can be taken from a stock which maximises the average catch at an acceptable risk level.

current meter = an instrument for measuring water velocity. A wheel with cups is rotated by the current and gives the velocity.

current potential yield = the catch that can be taken given the current resource abundance and prevailing ecosystem considerations. Abbreviated as CPY.

current system = areas strongly influenced by currents, e.g. tidal currents, geostrophic flows, longshore currents, all *q.v.* Important in transporting fish eggs and larvae, in productivity, in habitat formation, and in flushing pollutants.

currie = a small stool used by fishermen (Scottish dialect).

curve cast = a fly casting technique that avoids an obstacle or minimises the influence of water current or wind on the fly or line.

cusec = abbreviation for cubic foot per second. Used outside North America where the equivalent is cfs.

cusp = projection or point as on a tooth or spine.

cuspate = with cusps.

cuspid = with cusps.

cuspidate = with cusps.

cusplet = a small or secondary cusp; also a denticle.

custom cut = regularly shaped triangle cut from a block of frozen fish. Usually breaded and battered.

custom processor = a business which does not own the fisheries resources it is processing.

customary right = a customary right is a right of individuals or groups founded upon customary, long continued practices and usage, such as a fishing right.

cut = 1) a narrow body of water cutting through land.

cut = 2) a canal.

cut = 3) a portion of netting in a cod trap raised by ropes so as to force the fish back toward the end of the net for easy removal (Newfoundland).

cut = 4) a cross-section of a fish.

cut bait = any bait cut into small pieces or chunks, but usually fish.

cut herring = headless and mostly gutless pickled and spiced herring. Also called clipped herring.

cut lunch herring = marinated split herring with the skin and bones; cut into small pieces and packed in vinegar or wine sauces.

cut pole = fir branch or thin trunk, needles removed, used as a fishing rod (Newfoundland).

cut spiced herring = filleted and skinned herring cured in salt, sugar and spices and packed in brine with vinegar, sugar and spices. May refer to herring prepared this way but cut into small pieces.

cut surface = the exposure of a fleshy surface in a fish product by forming steaks, by heading, by heading and gutting, by filleting or splitting.

cut-off = 1) a new natural or artificial channel circumventing a river bend.

cut-off = 2) a lake formed by the closure or cutting off of a bend in a river.

cut-off the linnet = cut (3).

cut-off the twine = cut (3).

cut-tail = a cod identified by a notch or cut in its tail made by an apprentice fisherman or supernumerary such fish being held only share of the voyage's profits (Newfoundland).

cut-throat(er) = member of a fish-cleaning crew in Newfoundland who cuts the throat of the cod-fish and slits the belly open from gills to vent in preparation for heading, splitting and salting. A two-edged knife used in this process.

cutaneous = pertaining to the skin.

cutaneous artery = an artery running horizontally near the lateral line and serving the superficial muscle layers. It is formed from the joined superficial branches of the intercostal arteries.

cutis = dermis, the lower skin layer.

cutlet = flesh cut from both sides of a fish joined at the back. Herring cutlets may be packed in wine, sour cream or tomato cocktail sauces. Also called block fillet, *q.v.*

cuttbow = a hybrid between cutthroat and rainbow trout, having the red cut throat and rainbow flank stripe.

cutter = 1) a single-masted fore and aft rigged sailing vessel.

cutter = 2) a steam-powered fish carrier which brought the catch to market.

cutter = 3) a fish filleter, a person who prepares fish for eating by removing fins, internal organs and bones and cuts large fish into fillets and steaks.

cutthroat = a person who cuts the throat and splits the belly when a fish is processed.

cutting board = a piece of wood used for cutting up fish or bait and protecting expensive boat gunnels.

cutting edge = 1) the leading edge of a fin.

cutting edge = 2) the ridge on the mesodistal edge of the crown in shark teeth.

cutting over = a disruption of the circulus pattern on scales resulting from erosion of the edge. Circuli formed after the erosion appear to intersect or cross over others that had been formed earlier. If the scale edge erosion is an annual event, the cutting over marks may be used to detect annuli. Also called crossing over.

cutting rate = the sequential cutting of meshes to reduce net width at a given rate.

cuttlefish = not fish but a cephalopod mollusc with 10 arms and a calcified internal shell.

Cuvierian duct = the common cardinal vein. The anterior cardinal vein returns blood from the head and the posterior cardinal vein from the trunk, joining together as the common cardinal vein (also called incorrectly the vitelline vein). The jugular vein from the lower jaw also empties into the common cardinal vein. The two common cardinal veins empty into the sinus venosus, *q.v.*

Cuvierian sinus = large vessels at the back of the gills which collect venous blood from the body and return it to the heart.

CWT = abbreviation for coded-wire tag (a small (0.25 mm diameter x 1 mm length) wire etched with a distinctive binary code and implanted in the snout of a fish (usually a salmonid) for mark-recapture studies).

cwt = hundredweight (50.802 kg (long), 45.359 kg (short)). Abbreviated as cwt, long and cwt, short respectively.

cyan = dark blue.

cyanide fishing = use of sodium cyanide (or another cyanide compound) to stun and capture coral reef fishes for the aquarium and live food trade.

cyano- (prefix) = dark blue.

cyanomorph = a colour morph with a dominant blue colour.

cyarlin = 1) a line or net that has not caught any fish (from the witch whose spell binds the nets or lines, the spell being broken only when the first fish has been caught) (Scottish dialect). Also spelled kyarlin.

cyarlin = 2) the first fish caught on a line or in a net (Scottish dialect). Also spelled kyarlin.

cyarlin = 3) fines imposed on fishermen whose nets or lines catch the fewest fish, the various fines being pooled to provide a feast for the whole crew (Scottish dialect). Also spelled kyarlin.

cyclamen = *Cyclamen*, a genus of plants of the Primulaceae, the Primrose family, used as a fish poison in a paste or thrust among rocks, enabling fish to be scooped up.

cyclo-ctenoid scale = a scale intermediate in form between cycloid and ctenoid scales; teeth are present but are small, smooth and few in number, e.g. in characoids.

cycloid = having a smooth-edged margin.

cycloid scale = a smooth-edged round or oval scale composed of acellular dermal bone lacking small spines on the posterior exposed edge. Typical of many Teleostei. Some cycloid scales may have a serrated margin and are then termed spinoid scales.

cyclomorial = fish scales of a form in which large, stout units are added anteriorly and light thin, elongated units are added posteriorly. The bases of the large lepidomorial units grow concentrically around the previously added bases and are partially fused.

cyclospondylous = a type of vertebra consisting of calcified rings around the notochord in Elasmobranchii and Holocephali. The calcification extends only to the chordacentrum or notochordal sheath, the arches are cartilaginous.

cyclospondyly = the condition of a cyclospondylous vertebra.

cyclostome poisoning = poisoning from eating Myxinidae or Petromyzontidae generally characterized by nausea, vomiting, dysenteric diarrhoea, tenesmus, abdominal pain, and weakness, with recovery within several days. Most poisonings are reported as due to failure to de-slime the fish. Poison is reported removed or inactivated by covering the fresh fish with salt and leaving it in concentrated brine for several hours prior to cooking.

cylinder pump = a type of air pump for aquaria which can produce great volumes of air. Noisier than the more common diaphragm pumps.

cylindriform = cylindrical in shape.

cypress swamp = a wetland with cypress trees as the dominant species, usually with areas of permanent water cover (in the southeastern U.S.A.).

cypriere = a cypress swamp in Louisiana.

cyprinid herpesvirus I (CHV or CyHV-1) = carp pox (one of the oldest known fish diseases found in cultured carp, other cyprinids, pike-perch and aquarium fishes. It is caused by *Herpesvirus cyprini*. Also known as carp papillomatosis, epithelioma papulosum, and fish pox. Skin lesions appear as the water temperature drops in winter as small milky-white spots that merge and cover large skin areas).

cyprinid herpesvirus II (CyHV-2) = a haematopoietic necrosis herpesvirus which affects goldfish and is closely related to carp pox or CyHV-1 and koi herpes virus or CyHV-3. A member of the family Herpesviridae as above.

cyprinid herpesvirus III (CyHV-3) = also known as koi herpes virus (KHV). This is a deadly virus affecting carp including koi. A member of the family Herpesviridae as above. There is no cure for the disease and it is difficult to detect.

cyprinin = the toxic substance obtained from the milt of the carp, *Cyprinus carpio*.

crioplesiotype = an unofficial term in nomenclature for the principal or typical specimen among several plesiotypes (q.v.).

cystic vein = one of several veins draining capillaries of the gall bladder to the hepatic portal vein.

cystoarian condition = where peritoneal folds grow around the gonad and form oviducts which conduct the eggs to the exterior. The duct may also function to conduct the sperm to the egg in groups with internal fertilization, e.g. Clupeoidei. Compare gymnoarian.

cytotype = an unofficial term in nomenclature for a portion of a type prepared to show identical cytological features, e.g. chromosomes, as those originally described for the taxon.

## D

D = 1) abbreviation for dorsal fin (rays).

D = 2) Devonian, a geological period within the Palaeozoic Era ca. 413-365 million years ago; called the Age of Fishes.

D1 = abbreviation for first dorsal fin (rays).

D2 = abbreviation for second dorsal fin (rays).

D3 = abbreviation for third dorsal fin (rays).

D30 = number of dorsal fin rays to the 31st vertebra, e.g. in Carapidae.

D200 = number of dorsal fin rays to the 201st vertebra, e.g. in Nemichthyidae.

d bone = coronomeckelian (a small bone on the postero-lateral part of Meckel's cartilage of the lower jaw. Often a point of insertion of the adductor mandibulae muscle. Also called sesamoid angular, supraangular, sesamoid articular, articular sesamoid, splenial or os meckeli).

D-rig = a fishing rig where the bait is tied to a D-shaped loop on the back of the hook shank.

D-zone = that part of a microincrement of an otolith that is dark in transmitted light or is a depressed region when acid-etched and seen with a scanning electron microscope. It has more organic matrix and less calcium carbonate than the L-zone, q.v. Also called discontinuous zone or matrix-rich zone.

dab = 1) a common name for various species of flatfishes (Order Pleuronectiformes). Origin unknown.

dab = 2) to fish by gently dipping the bait onto the water surface (dabbing).

dab = 3) the drowned corpse of an outcast woman (riverside thieves' slang, England).

dab darter = one who spears dabs or flatfishes.

dabber = dap (2).

dabbling = working a lure or bait up and down in the same spot repeatedly. Usually carried out from behind cover such as a bush or tree.

dacker = the ripple in water caused by the rapid motion of fish under the surface (Scottish dialect).

dacriform = tear-drop shaped.

dactylogyrosis = infestation with trematodes (*Dactylogyrus* spp.) causing the fish to secrete more mucus, paling of gills, opening of the operculum, difficulty in respiration and gill dropsy.

daeng = gutted and split milkfish (*Chanos chanos*) or Indian mackerel (*Rastrelliger* spp.) brined and sundried (Philippines).

dagger = † or crucifix (q.v.).

Dagon = the fish god of the Philistines, the upper half being a man and the lower half a fish. The fish half represented fertility. The name is from the word dag, meaning fish. The Babylonians had a myth of a being who emerged from the Erythraean Sea, being part fish and part man. Also found in Assyrian sculpture.

Dahlgren's neuron = one of a series of nerve cells which are neurosecretory and located in the caudal neurosecretory system. The cells may be neurosecretory giant-cells, two or three times as large as ordinary neurons, and may exceed 100 microns in diameter. They have a nucleus which is polymorphic. Very small fishes may have Dahlgren's cells which are very small and not histologically distinguishable.

dahn = a small, flagged buoy attached to the end of fixed gear to mark its position.

daily growth increment = daily increment.

daily increment = a D- and L-zone on an otolith formed in a day. Also called daily ring, daily growth increment.

daily limit = the number of fish that an angler can retain from a day's fishing.

daily limit 0 = for conservation purposes, fish caught by anglers must be returned alive to the water. Also called catch and release, closed to retention and non-retention.

daily ration = amount of food consumed in a day.

daily retardation of tides = the amount of time by which a tide grows later day by day; about 50 minutes.

daily ring = a growth increment of one day on an otolith or scale in young fish, formed as a result of a circadian rhythm. Not found in adults or under conditions of poor growth. Daily increment is a preferred term.

daliane = a structure of wood or netting directing fish into a trap. Made to intercept large schools of tuna or mullets in the Black Sea and dependent on a watchman to close the trap entrance or lift the net floor after the school enters.

dam = a barrier controlling the flow of water and backing up water. Forms a lacustrine habitat (the reservoir) for fish where one did not exist before. Initially fish production is very high when stocked but declines as nutrients from flooded terrestrial ecosystems are used up. Release of water from reservoirs may radically affect fish downstream by changes in temperature regimes, flushing of habitats, and changes in silt loads. Storage dams store water and diversion dams divert water.

dambo = a shallow depression, having water seasonally and usually found near a river (South-central Africa).

[Dame Juliana Berners](#) = reputed author of "A Treatyse of Fysshynge with an Angle" from "The Boke of St. Albans" in 1496, the first evidence of fishing as a sport and the first literary treatment.

damp = a low grade of dried and salted cod (Newfoundland).

damp fishes = a checklist used by English Heritage Inspectors when making a description of a building to be preserved:- B, building type; D, date; A, architect; M, materials; P, plan; F, facade; I, interiors; S, subsidiary features; H, history; E, extras; S, sources.

damper - dap (2).

dan leno = a part of a trawl, the short pole or spreader to which each wing end was attached (probably from a corruption of the French word guindineau).

dan leno arm = butterfly (an L-shaped steel plate shackled between the dan leno spindle and legs. Also called arm, banana, boomerang, dan leno bracket, dan leno spreader, devil's elbow, spreader bar).

dan leno board = a small otter board.

dan leno bobbin = a large and hollow steel ball on a trawl between the otter boards and the net; functions to prevent the trawl wings from becoming entangled with small objects.

dan leno bracket = butterfly (an L-shaped steel plate shackled between the dan leno spindle and legs. Also called arm, banana, boomerang, dan leno arm, dan leno spreader, devil's elbow, spreader bar).

dan leno hoop = a hoop-shaped dan leno made of bent wood with short rigging ropes wired to the outer circumference. Also called dan leno ring, geer, hoop, hoop bridle, round dan leno and yoke hoop.

dan leno ring = dan leno hoop.

dan leno spindle = a steel spindle through a dan leno bobbin. Also called axle or spindle.

dan leno spreader = butterfly (an L-shaped steel plate shackled between the dan leno spindle and legs. Also called arm, banana, boomerang, dan leno arm, dan leno bracket, devil's elbow, spreader bar).

dan leno stick = a ballasted wood pole with short rigging ropes attached, functioning like the dan leno bobbin.

dan leno triangle = a triangular piece of steel, functioning like a bobbin.

dance = 1) fish dance (a dance of Great Lakes Indians involving flipping motions of the hands and feet).

dance = 2) fish dance (any of a variety of dances world-wide involving fish and fishing, meant to improve catches by propitiating gods or celebrating a way of life).

dance = 3) a general term for reproductive behaviour involving stylised and formalised movements by the male and female pair.

dandy = 1) a paternoster (a fishing rig where the hooklength branches from the mainline. Various styles exist and may have rigid wire branches with several hooklengths. St. Peter is supposed to have used a paternoster ("our father") rig to catch fish, hence the name).

dandy = 2) the wire or rope used to bring the aft end of the trawl beam alongside when hauling.

dandy bridle = dandy (2).

dandy line = a fishing line, specifically for herring with bare white hooks, suspended by whalebone kept in place by a lead (Shetland Isles dialect).

dandy winch = the small winch positioned aft, used when bringing the trawl beam alongside. Also called dandy wink.

dandy wink = dandy winch.

Danish jar = a wide-mouth glass container with a snap-on polyethylene lid. Also called Copenhagen jar.

Danish pond = an aquaculture pond made by excavation or by constructing dykes, usually 10 times longer than wide, with a bottom that may require sealing or lining to prevent water loss. Also called earthern pond.

Danish seine = a seine or cone-shaped otter trawl which is hauled over an area of about 2 square kilometres to a stationary vessel from an anchor buoy, the very long towing ropes disturbing clouds of mud which help herd the fish into the net. Also called anchor seine, Danish seine trawl, Danish trawl.

Danish seine trawl = Danish seine.

Danish trawler = a vessel 60-65 feet long, over 10 gross tons, with a crew of two or three. The wheelhouse, engine and accommodations are forward and the fish hold is aft. The hauling ropes of the Danish seine are coiled into the well decks.

Danish trawl = Danish seine.

danleno = dan leno.

danleno spreader = dan leno.

dap = 1) to fish by letting a fly or baited hook touch the water surface, using a short piece of line on a long rod.

dap = 2) to fish for cod with a hand-line, weighted hook and bait near the surface of the water (Newfoundland).

*Daphnia* = water fleas are used as food for fish in aquaria.

dapping = touching a fly to the water surface immediately over where a fish lies, using a short piece of line on a long rod.

dark meat = 1) a commercial measure of fish flesh colour, e.g. canned tuna is dark meat or dark tuna when it does not meet the colour requirements of light meat, q.v.

dark meat = 2) muscle from just under the skin on each side of a fish that is darker and richer in fat than other flesh. Also called blood meat, brown muscle, dark muscle, red muscle.

dark muscle = dark meat (2).

darne = a cut of steak of round fish cut on the bone.

dart (noun) = 1) an Inuit harpoon used to kill salmon and char (and seals).

dart (verb) = 2) to kill fish and seals with a spear or harpoon.

darter = 1) a member of the family Percidae, small colourful fishes found only in North America.

darter = 2) a type of plug used in angling. It floats when at rest but on retrieval submerges and wobbles and weaves. Used especially for bass (Centrarchidae).

darting = the spearing of fish.

darting speed = burst speed (the maximum speed a fish can maintain for a short period (5-10 seconds). Used in seizing prey or escaping a predator).

Darwen salmon = dogfish (*Squalus acanthias*) dried in air with the skin removed to disguise it; sold as salmon in the Highlands of Scotland and known by this name in Lancashire down to the 1950s.

Darwin fish = a car bumper sticker or symbol comprising the outline of a fish with short legs and the word Darwin in the centre of the fish body. Shows that the person believes in evolution. A parody of the Christian fish symbol.

Darwin's Nightmare = a 2005 movie about the exotic Nile perch in Lake Victoria, flash-frozen for export to wealthy countries, and the devastating effect this introduced fish has had on the people of the region and the native cichlid species flock.

dash = an elongate or streak-like melanophore in larval fishes.

dasher = a device used to scare fish into nets, either by making noise or by its reflective surface flashing light (Newfoundland). See also douser, thrasher and trouancer.

data (singular datum) = facts that result from measurements or observations.

data base = a consistent set of data that can be used for analysis, e.g. counts and measurements of fish structures used in defining and diagnosing species. Also refers to the computer software in which the data is stored.

data deficient = in the IUCN Criteria for threatened species, a taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. Abbreviated as DD. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution is lacking. Data Deficient is therefore not a category of threat or Lower Risk. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and threatened status. If the range of a taxon is suspected to be relatively circumscribed, if a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

data set = data and accompanying documentation which relate to a specific theme, e.g. catches by vessel type for a certain year, counts and measurements used in describing a fish species.

database = data base.

dataless management = management of a fishery based on the available information, without delay due to lack of technical data.

date fish = not a fish but a bivalve, *Pholas*.

date of collection = the calendar date on which a specimen was collected in the field. Accession dates and catalogue dates may be months or years later.

date of publication = the first day, reckoned according to the Gregorian calendar, on which copies of the publication became available by purchase or free distribution (not necessarily the date printed on the work itself). This applies to a work (and to a contained name and nomenclatural act). If the actual date is not known, the date to be adopted is regulated by the provisions of the International Code of Zoological Nomenclature.

datum = 1) the singular of data.

datum = 2) any position or element in relation to which others are measured, e.g. water levels in rivers, tides.

daughterless = a gene that can be inserted into fish eggs producing 80% males. This may be used as a means of controlling invasive fish species as long as the gene cannot move between species.

day = fish day (a day on which fish is eaten according to religious requirements; a fast day).

day boat = a boat making a one day fishing trip.

day length = the duration of the light period in a given 24 hours. Day length or daylength may be manipulated for aquaculture purposes such as early smoltification and breeding.

day ticket = a fishery where anglers purchase a ticket for the day's fishing on arrival.

day-class = the cohort of fish spawned or hatched on a given day or date. May be date of spawning or date of hatching.

day-degree = a unit taking temperature and time in days into consideration to indicate degree of development. Calculated by adding the average daily temperature for each day, e.g. if the average daily temperatures that a 3-day-old trout egg has been subjected to are 11, 12 and 13 degrees centigrade, the eggs are at the 36 day degree stage. This is abbreviated 36 D. Abbreviation D°.

de- (prefix) = down, away, from.

de-listing = removal of a species from a list of threatened and endangered species.

deaccession = 1) a specimen removed permanently from a museum collection.

deaccession = 2) the process of removing a specimen from a museum collection. Material may be deaccessioned if it is found to belong to another institution, is to be donated to another institution, has deteriorated beyond any use, is required for destructive analysis, etc.

dead as a herring = 1) quite dead.

dead as a herring = 2) dead as a shotten herring.

dead as a shotten herring = an expression based on the perception that a spawned-out herring dies quickly (obsolete).

dead cat on a line = an indication that something is amiss or fishy. Derived from trot-fishing for catfish; if there is a dead catfish on the line then the line has not been checked by the fisherman for some time, indicating that something is awry.

dead drift = the way artificial flies drift with the current so as to appear natural; this requires that no part of the line and rig cause unnatural drag, frightening away the fish.

dead fish polo = a game involving canoes and a "fish" (really a sponge). The aim is to fling the "fish" into an opponents canoe using a paddle; if the "fish" lands in your canoe, you are out of the game.

dead lake = an ageing lake, overgrown with aquatic vegetation.

dead salmon = a proprietary paint colour, the name coming from a painting bill for the Library at Kedleston in 1805. Similar to smoked trout, a pinkish grey.

dead sock = a sock-shaped, lower extension of the net in a fish cage used in aquaculture.

dead spot = an area of a water body where circulation is minimal and anaerobic conditions develop, e.g. in an aquaculture pond.

dead water = 1) unmoving water in a water body.

dead water = 2) the eddy water behind the stern of a boat.

dead zone = a very large dead spot in the ocean, e.g. the seasonally-depleted oxygen levels (< 2mg/l) in the Gulf of Mexico covering 18,000 sq km (increasing each year - expected to be 22,126 sq km in 2007). Fish can swim away from such areas if onset is gradual but many invertebrates die. Caused by algal blooms dying and sinking to the bottom where the decay process depletes oxygen. The algal bloom can be caused by runoff fertilisers.

deadbait = dead fish used as bait in angling.

deadfall = dead trees fallen into the water providing cover for fishes.

deadfish grind = a move in inline skating by which the skater's leading foot slides sideways while the trailing foot rolls on only the front wheel.

deadhead = a submerged log close to the surface but not lodged in the river bottom. Dangerous to motorised traffic. Sometimes used as a mooring buoy. See also planter (3).

dealer = 1) a middleman between the fishermen of a locality and fish merchants in a central community (Newfoundland).

dealer = 2) a fisherman operating under a credit or truck system (*q.v.*) (Newfoundland).

death crown = infestation of sea lice on farmed fish about the head region, severe enough to expose bone.

death assemblage = thanatocoenosis (an assemblage of organisms or their parts brought together after their deaths, e.g. fish bones by flowing water).

death of kings, fishy= 1) a surfeit of lampreys, the meal that reputedly killed Henry I of England in 1135. The flesh is said to be fatty and not easily digested.

death of kings, fishy = 2) Edward IV of England died in 1483, from a chest infection, caught while fishing on the River Thames. Pneumonia resulted and, with pleurisy, finished him off although rumour at the time thought poison was the cause.

death rate = ratio of death to population, usually given as a percentage.

deboned fish = the flesh of a fish separated from skin and bones by mechanical means (see bone separator). Also called minced fish, mechanically recovered fish, recovered fish flesh, boneless fish and boneless fish meat.

debris catcher = trash collector (a wire fence across a stream used to retain debris and create a dam and a plunge pool; makes habitat for fish and collects gravel for spawning habitat. Also called trash catcher or grizzly).

debut line = the name of the first line thrown out of a boat to a man on the bank, as the boat is pulled across a river, casting out a net all the way. A Severn River, England salmon-fishing term. See also muntle.

decalcification = the absorption of calcium from bone, making the skeleton fragile, e.g. unbuffered formalin can become acidic and decalcify bone.

dechlorinating compound = a substance used to remove chlorine and neutralize chloramines from tap water for use in an aquarium. Charcoal does not remove chloramine.

deciduous = loosely fixed, easily detached, e.g. scales of *Clupea*.

decision analysis = a method that evaluates the expected outcomes, e.g. average catch, constancy of catch, probability of rebuilding to a given biomass target, etc., of alternative management controls used when there is uncertainty. A decision analysis can also address management consequences under different plausible assumptions about the status of the stock.

decision rule = control rule (a protocol for specifying harvest rates in relation to stock status and limit and target reference points. A harvest strategy expected to result in a long-term average catch approximating the maximum sustainable yield. Also called harvest control laws).

deck glass = a heavy sheet of glass in the bottom of a boat for viewing or spotting fish.

deck weight = deck-load.

deck-load = a pile of fish on the deck of a vessel.

deckhand = the all-purpose worker aboard a ship, usually paid a share of the profits on a fishing vessel.

Declaration = a minor and provisional amendment to the International Code of Zoological Nomenclature for immediate incorporation, published in the Bulletin of Zoological Nomenclature, to remain in force until ratified or rejected by future International Zoological Congresses.

decline = a reduction in the number of individuals, or a decrease of the area of distribution, the causes of which are either not known or not adequately controlled. Does not include natural fluctuations nor a planned fishery.

declivous = sloping downwards, declining.

decommissioning = removing a vessel from service and from the fishing register in the United Kingdom.

decompression sickness = gas bubble disease (supersaturated gases (>125%) in water entering the body fluids of fish causing bubbles, an embolism). Also called bends or Caisson's disease.

decoy = an imitation of a fish used to attract fish close enough to be speared. Used in ice fishing in North America.

decumbent = bent downwards.

decurved = curved downward, usually in reference to the lateral line, e.g. in such cyprinids as *Richardsonius*, *Notemigonus*, *Hemiculter*, *Aspius*.

decussating = x-shaped, intersecting.

dee = deese.

Dee's disease = bacterial kidney disease (a bacterial infection with *Renibacterium salmoninus* or *Corynebacterium* sp. affecting salmonids, usually when temperatures are falling. The disease may be chronic or acute and has no treatment. Causes swelling of internal organs (oedematous, grey and corrugated kidneys with off-white lesions) and haemorrhages. Lesions may occur also in the liver and spleen and muscle contractions occur. External symptoms may be absent or include exophthalmy, skin darkening, abdominal swelling, and skin ruptures and vesicles. Also called Corynebacterial disease and kidney disease).

deem = used in taxonomy to indicate something that is not strictly true, e.g. a publication is deemed to be published by the author rather than by the actual publisher; the date of a publication is deemed to a particular date whether or not true.

deep = 1) areas of deeper water between the shallower banks where fish are found and fished. Also called deeps.

deep =2) the number of meshes in one direction of a net.

deep cell = a cell in the blastodisc or blastoderm that is completely covered by other cells.

deep cell layer = a layer of deep cells of fairly uniform thickness that forms during early epiboly on conversion of the blastodisc to the blastoderm. This layer gives rise to the epiblast and hypoblast during gastrulation.

deep fore reef = the deepest seaward part of a coral reef; a vertical cliff beginning at a depth of about 60 m.

deep longline = a horizontal line with hooks lying on the sea floor.

deep sand bed = a filtration method in marine aquaria consisting of layers of sand up to 6 inches deep where anaerobic bacteria can grow and convert unwanted nitrates to nitrogen gas. Associated invertebrates burrow in the sand and facilitate a deeper penetration of the water.

deep scattering layer = a layer in mid-depths of the sea detected by echo sounders, which rises at night and sinks during the day. Composed of organisms, many of which have a gas filled chamber, such as certain jellyfish and fishes. Also called false bottom. Abbreviated as DSL.

deep sea (adjective deepsea) = the deeper parts of the ocean.

deep shelf and terrace = an insular horizontal habitat in the sea found at about 40 to 500 m. Interrupts a steeper slope and may occur in a series extending seaward from the shelf of an island or bank.

deep slope = an insular vertical habitat in the sea from about 40 to 500 m.

deep trap net = a pound net held in place under water by anchors and buoys.

deep water (adjective deepwater) = 1) permanent fresh water 2 metres below low water or the edge of emergent macrophytes, whichever is deeper.

deep water (adjective deepwater) = 2) ocean water where waves are not affected by bottom conditions; water deeper than one half a surface wave length.

deep-abyssal = waters of the sea below a depth of about 2,000 metres.

deep-drop = bottom fishing in deep water, sometimes in excess of 300 m, using a very large weight and circle hooks.

deep-sea = portion of the oceans below 200 metres or for deep-sea fish below 1000 m.

deep-sea trawl = the equipment used by a deep-sea trawler.

deep-sea trawler = a large long-distance trawler, not a vessel that fishes the deep-sea.

deep-skinned = fish prepared with the skin and the underlying fat layer removed. This gives a milder flavour and improves shelf life.

deepin worker = a net weaver.

deeping = 1) a section of a drift net twenty meshes deep, to which other sections are attached to the requisite depth.

deeping = 2) a strengthening band along the sole of a trawl, a score of meshes deep.

deeping = 3) the bag of a salmon net.

deeps = 1) the deepest parts of the oceans, where the bottom is below 3000 fathoms (5487 m).

deeps = 2) deep (1).

deepsea = adjective for referring to the deeper parts of the ocean.

deepsea trawl = the equipment used by a deep-sea trawler.

deepsea trawler = deep-sea trawler.

deepwater = 1) adjective for referring to deep water.

deepwater = 2) often used for any water of considerable, unspecified depth.

deepwater species = in the sea, fish found at depths below 400 metres (bathypelagic, mesopelagic and benthopelagic fishes).

deese = a place where herrings are dried, the fish being hung on sticks (Sussex dialect) (deese may be the plural of dee). Also called herring hang.

deficiency disease = deficiency syndrome.

deficiency syndrome = improper feeding leading to abnormalities in behaviour, internal anatomy and function, growth and development.

definition = 1) a statement of the characters that distinguish a taxon; a diagnosis. See also differentia.

definition = 2) a statement specifying the meaning of a name, i.e. the taxon to which it refers.

definitive host = the fish in which a parasite passes its adult or reproductive phase. Also called final or primary host.

deflector screen = a wire mesh screen installed where water is diverted from a stream or river to keep fish from entering the diversion channel or pipe. Also called diversion screen.

degenerate = said of a character or structure that has evolved to a less developed state from its ancestral state.

deglutition = the act or power of swallowing.

degree = 1) 1/360 of a circle or 60 minutes. The symbol here and below is °.

degree = 2) 60 nautical miles, 69.05 statute miles or 111.12 km.

degree = 3) a temperature unit (Celsius or Fahrenheit). Strictly 10°C is an actual temperature while 10C° is a range (from say 23 to 33°C).

degree = 4) water hardness, see degrees of water hardness.

degree day = see day-degree.

degree of digestion = digestibility.

degrees of water hardness = dGH (water hardness expressed in degrees of hardness. 0-4 is very soft, 5-8 soft, up to 30 which is extremely hard water). Note that different countries use different measures: 1 English (Clark) degree is 14.3 p.p.m. calcium carbonate, 1 American degree is 17.1 p.p.m. calcium carbonate and 1 French degree (fh) is 10.0 p.p.m. calcium carbonate. However 1 German degree (dh) is 17.9 p.p.m. calcium oxide. Confusingly the German dh is used generally for degrees of hardness.

dehydrated fish = fish that have been dried under controlled conditions with or without machinery but not be exposure to the climate.

dehydration = a white or yellow abnormality on the surface of frozen fish which masks the colour of the flesh and penetrates below the surface. It is caused by the sublimation process and the abnormality can only be removed by trimming away the affected parts.

deioniser = a device for filtering aquarium water using ion exchange resins.

delagic trawl = a trawl that can be fished demersally or pelagically without the gear having to be changed.

delay difference model = a type of biomass dynamic model used in fisheries that includes biologically meaningful parameters and accounts for time delays due to growth and recruitment.

delayed release = a change in the migration pattern of farmed salmonids, e.g. by feeding smolts in sea net cages before release to enhance the return rate.

delicatessen fish = fish prepared with salt, vinegar and spices, or smoked or salted and ready to eat but with a limited shelf-life.

délice = a neatly folded fish fillet.

delimitation = a statement of the character states which define the limits of a taxon; diagnosis.

delivery = casting an artificial fly to a fish or to an area of water suspected of holding fish.

delta = a fan-shaped or triangular alluvial deposit at a river mouth formed by the deposition of successive layers of sediment.

demand curve = relationship of price charged for a unit good such as fish per kg to the number of units a customer is willing to buy at that price.

demand feeder = a device allowing measured amounts of food to be delivered when triggered by fish in aquaculture. Also called pendulum feeder.

deme = an isolated population of a species tending not to interbreed (because of geographical barriers) with other populations; a local interbreeding group. Differs slightly in morphology or life history but not given taxonomic status.

demersal = sinking; bottom (e.g. eggs which sink to the bottom or are deposited on the bottom); dependent on the bottom. Said of fish that live near the bottom of the ocean, of a lake or of a river, but are capable of active swimming. Opposite of pelagic.

demersal fishery = a fishery concentrating on the capture of demersal species.

demersal pair trawling = pair trawling (bottom trawling by two vessels towing the same net. Very large nets can be towed in this manner by relatively small boats and the net is generally hauled alternately aboard the two vessels for processing of the catch. The net mouth is kept open by the outward pull of the two vessels).

demersal trawling = bottom trawling, e.g. otter trawl, beam trawl.

demersed = situated or growing under water, e.g. aquatic plants.

demi-sel = hareng saur or salted herring, partially desalinated and cold smoked, whole ungutted or gibbed, also heads and gut removed. The curing time with salt is 2-3 weeks (France) It is called demi-sel when subject to prolonged desalting for more than 46 hours and lightly cold-smoked.

demi-vegetarian = a vegetarian who eats fish. See also pesco-vegetarian and pescatarian.

demography = the study of birth and death rates, age distributions and population sizes.

demophora = growth in demands on the freshwater supply and other finite environmental resources.

denatant = swimming, drifting or migrating with the current. Movement of eggs and larvae away from the spawning area. Opposite of contranatant, q.v.

denatured alcohol = ethanol rendered unfit for human consumption by addition of methanol (methyl alcohol or wood alcohol) or other substances. Used in some fish collections.

denticulate = tooth bearing or having denticles. Also spelled denticulate.

dendric = a tree-like pattern; used to refer to branching of streams.

dendriform = a structure resembling a tree or shrub, branching extensively. See also dendritic and dendric.

dendritic = tree-like, branching. Used in reference to melanophores or to drainages.

dendritic drainage system = the commonest type of drainage system comprising a main river with tributaries that themselves have tributaries. Such a system usually occurs on a gentle slope. See also annular, deranged, parallel, rectangular and trellis drainage systems.

dendritic organ = a small arborescent organ found between the anus and the anal fin in certain Plotosidae (e.g. *Plotosus*, *Cnidoglanis* and *Euristhmus*). Organ with two main cell types, those with parallel groups of cytoplasmic tubules and many mitochondria, and clear cells with a

network of cytoplasmic tubules. May have an osmoregulatory function. Also called arborescent organ.

dendrogram = a branching diagram that depicts the relationships between a group of items sharing a common set of variables. A phylogenetic dendrogram is called a cladogram, *q.v.*

denied name = *nomen negatum* (a denied name, an unavailable name which has incorrect original spellings as defined by the International Code of Zoological Nomenclature).

DeNiel fishway = a chute with lateral baffles that reduce the water's energy and leave a clear passage for fish to swim over the low barrier. There are no resting areas although pools may be provided for this purpose or to reduce flow velocity. See also pool-and-weir ladder, rock-ramp fishway and vertical slot fish passage.

denil fishway = DeNiel fishway.

denitrification filter = an aquarium filter that provides nitrate ( $\text{NO}_3$ ) removal using anaerobic bacteria that separate nitrogen from oxygen.

denizen of the deep = a synonym for fish.

dennage = dinnage.

dens acrodontis (plural dentes acrodontes) = acrodont (type of tooth ankylosed to the jaw along the midline of the jawbone, rather than to the inner edge, the condition in most fishes. Attachment is by connective collagenous tissue with impregnated calcium salts and, in maxillary and mandibular teeth, by a bony piece between the tooth and the bone).

dens incisoris (plural dentes incisores) = incisiform tooth (compressed and wedge-shaped tooth with a cutting edge resembling incisors of higher vertebrates, e.g. in *Serrasalmus*, the beak of Scaridae).

dens molariformis (plural dentes molariformes) = molariform teeth, shaped like a molar in mammals being round and flattened, used for crushing molluscs and crustaceans.

density = the number or weight of organisms per unit area or volume.

density dependence = the dependence of a factor influencing population dynamics (such as survival rate or reproductive success) on population density. The effect is usually in the direction that contributes to the regulative capacity of a stock.

dental formula = the number of teeth in a fish jaw, expressed as left and right (separated by a hyphen) and upper and lower (separated by a line). Symphysial teeth of different morphology may be interspersed between these counts. Counts are usually based on and expressed as ranges, seen over a sample of the species concerned, as individual counts differ. See also pharyngeal tooth count.

dentale = dentary.

dentary = the anterior, paired, dermal bone in the lower jaw. Usually the only tooth-bearing bone in the mandible, the two halves have a V-shape and meet at the jaw tip or mandibular symphysis. Posteriorly it has a coronoid process directed dorsally and a ventral process bearing the mandibular sensory canal on its outer face.

dentary elevation = the knob at the tip of the lower jaw at the junction of the dentaries which usually fits into an opposing indentation in the upper jaw.

dentate = having teeth or tooth-like points; serrate.

dentes acrodontes = plural of *dens acrodontis*.

dentes incisores = plural of *dens incisoris*.

dentes molariformes = plural of *dens molariformis*.

denticle = a small tooth-like body; also used for the placoid scale of Elasmobranchii. Also called dermal denticle.

denticular teeth = teeth on the snout and lower jaw of male Lophiiformes used to attach to the female.

denticulate = tooth bearing or having denticles. Also spelt dendiculate.

dentiform process= a tooth-like projection at the symphysis of the upper jaw in Balitoridae. It may fit into a notch in the lower jaw. Also called *processus dentiformis*.

dentigerous = tooth-bearing dermal bones, sometimes associated with endochondral bones. These bones are found on the mandibles, the tongue, the mouth cavity and the branchial apparatus. The teeth are formed independently of the bones but later in development join them by means of an intermediate tooth plate or by connective fibres.

dentigerous palatine = superficial bone bearing teeth covering the autopalatine.

dentine = a hard mesodermal material in teeth and some scales (cosmoid, ganoid and placoid scales) produced by odontoblasts. Like bone but without cells as the odontoblasts retreat leaving behind dentinal tubules (canalliculi) for protoplasmic processes.

dentition = tooth pattern, including arrangement and shape.

dento-spleniale = dentary.

depauperate = impoverished; said of ichthyofaunas or areas with little diversity in numbers or species.

dependent species = a species dependent on another for survival, e.g. a predator on a prey, commensalism.

depensation = mortality is depensatory when its rate (i.e. the proportion of population affected) increases as the size of the population decreases. Depensation may explain why marine fish populations like the Atlantic cod are slow to recover even when fishing is halted. Per capita mortality may increase because of changes in predator-prey interactions, mate availability may be reduced, fertilisation success may be lowered, operational sex ratios may change, and there may be a reduced intensity of social interactions during spawning. Compare compensatory mortality where the mortality rate decreases as the population size decreases. Depensation is also called the Allee effect.

depensatory = the adjective for depensation.

depleted = a very low abundance level of a stock caused by fishing as compared to historical levels.

depletion = for renewable resources, the part of the catch above the sustainable level of the resource stock.

depletion-based assessment technique = a prediction of how large the total (cumulative) removal would have to be in order to drive the relative abundance to zero. This predicted total removal is then an estimate of the initial stock size before removal begins.

deposit feeding = benthic feeding on plant and animal debris on or just below the bottom surface.

depredate = to capture prey (predate is not a verb unless you are dating before; the noun predation being often transformed into a verb meaning to capture prey).

depressed = flattened from top to bottom, e.g. Rajidae. Opposite to compressed.

depressed length = the length of a fin from its origin to the posteriormost point, measured when it is pressed against the body.

depressed fishery = a fishery with a declining population trend having occurred over a period of time appropriate to that fishery. The condition of a fishery that exhibits declining fish population abundance levels below those consistent with maximum sustainable yield.

depressed stock = a stock of fish whose production is below expected levels based on available habitat and natural variations in survival levels, but above the level where permanent damage to the stock is likely.

depressiform = depressed.

depression = any lower area, such as on the ocean floor.

depth = vertical distance through, height, e.g. body depth, caudal peduncle depth, head depth, etc., q.v.

depth contour = a map line connecting all points having the same water depth.

depth control = in angling, controlling the depth at which a lure or bait is fished.

depth finder = a sonar device used to determine depth and bottom structure and to locate fish.

deranged drainage system = a system without any obvious or coherent pattern as a result of much geological disturbance, as in areas cleared of soil cover by ice ages. The drainage patterns are still being determined and the glaciers left much water that accumulates in low points as lakes. See also annular, dendritic, parallel, rectangular and trellis drainage systems.

derby = a fishing competition with money and prizes for the best catches; used in North America.

derby style fishing = race-to-fish (a pattern of fishing characterized by an increasing number of highly efficient vessels fishing at an increasing pace, with season length becoming shorter and shorter; a management system where individual boats race to take as much of the total allowable catch before the fishery closes. Also called olympic fishing).

Derceto = the Syrian fertility goddess who fell into a lake at Bambyce near the Euphrates River in Syria. She was saved by a large fish and as a result ancient Syrians did not eat fish but worshiped their images as gods. Also known as Atargatis in Greek, whose temples contained fish ponds, the goddess punishing anyone who ate them by making them ill although her priests ate fish freely in a daily ritual.

derived = a character or character state not present in the ancestral stock; apomorphic. The term should not be applied to organisms or taxa since they are a mix of plesiomorphic and derived character states.

dermal = relating to the skin - the innermost of the two layers which arises from mesoderm.

dermal basihyal = basihyal (the cartilage supporting the tongue at the anterior end of the hyal series in Elasmobranchii. It is the anteriormost median endochondral bone of the basibranchial series, joining both branches of the hyoid series and forming the tongue skeleton in Teleostei. Dorsally it may have a dermal tooth plate called the glossohyal. The basihyal does not always ossify, e.g. in Salmonidae. Also called basihyobranchial).

dermal bone = any of the the superficial bones in Teleostomi derived from the dermis and overlying the deeper elements of the skull. Primitive fishes have more dermal bones than higher ones, e.g. the armour of Ostracoderma. Dermal bones are a form of membrane bones, i.e. they arose directly from connective tissue membranes without the cartilaginous precursors which precede endochondral bones. They may be divided into laterosensory canal bones that develop in relation to the sensory canals, bones derived from mesenchymous tissue and anametic bones (*q.v.*). Also called achondral, membrane, investing and covering bones.

dermal crest = the adipose fin in Cobitidae and Balitoridae.

dermal denticle = a small, tooth-like, dermal scale in the skin of Elasmobranchii (except Torpedinidae) and the claspers of Holocephali. Also called more commonly placoid scale, although dermal denticle is more correct anatomically.

dermal ethmoid = supraethmoid (one of the paired dermal bones above the ethmoid, anterior to the frontals. Also called dermethmoid, mesethmoid and dermal mesethmoid rostral).

dermal flap = a small skin flap, e.g. in some Syngnathidae.

dermal fold = a flap distinct from the pectoral fin on the side of the head in *Squatina*.

dermal mesethmoid rostral = supraethmoid (one of the paired dermal bones above the ethmoid, anterior to the frontals. Also called dermethmoid, dermal ethmoid and mesethmoid).

dermal process = a conical process on the tip of the upper, and sometimes the lower, jaw, e.g. in some Gempylidae and Trichiuridae.

dermal supraoccipital = dermosupraoccipital.

dermarticular = the dermal bone of the lower jaw laterally covering and often fusing with the angular or retroarticular.

dermatocranium = the skeleton of the cranium derived from dermal bone that includes most of the superficial cranium bones. See also chondrocranium and splanchnocranum.

dermatone = a segment of skin innervated by one spinal nerve.

dermatotrich = dermatotrichium (1).

dermatotrichium = 1) dermotrichium.

dermatotrichium = 2) a secondary ray distal to a lepidotrichium also originating as a scale. Usually forked and lying on the edge of the fin, e.g. *Doras* and *Synodontis* in Siluriformes.

dermentoglossum = lingual plate (a dermal toothed bone covering and sometimes fusing with the basihyal, e.g. in Osteoglossidae. Also called glossohyal, entoglossum, os entoglossum, supralingual or basihyal dental plate).

dermestid colony = a colony of beetles (usually *Dermestes*) used for cleaning large fish skeletons of flesh. Also called bug colony.

dermestotype = a joke term in nomenclature for a specimen from the type series that has been eaten by dermestids so its remains cannot be identified.

dermethmoid = 1) supraethmoid (one of the paired dermal bones above the ethmoid, anterior to the frontals. Also called dermal ethmoid, mesethmoid and dermal mesethmoid rostral).

dermethmoid = 2) ethmoid (the deep, embryonic, perichondral, cartilaginous bone ossifying in and around the nasal septum. Later covered by the nasals, pre vomer, adnasals (and rostrals) and located anterior to the orbit. It may not ossify in some Teleostei. Also called hypethmoid).

dermintermedial process = a small to large process on the floor or wall of the nar is in some Sarcopterygii. May be covered in cosmine.

dermis = the innermost of the two layers of the skin, the outer being the epidermis. Contains the scales, blood vessels, nerves, chromatophores, connective tissue. Also called the corium. Of mesodermal origin.

dermocrania = plural of dermocranium.

dermocranum (plural dermocrania) = the superficial portion of the skull overlying the endocranum and consisting of a series of dermal bones over the outside of the skull.

dermohyal = the bone located between the opercular and preopercular in Palaeoniscidae.

dermopalatine = the paired dermal bone covering the undersurface of the autopalatines (*q.v.*) which are commonly called palatines, especially when the dermopalatine and autopalatine fuse.

dermopterotic = supratemporal-intertemporal (a dermal bone overlaying the pterotic (or autopterotic). Also called intertemporal and membranopterotic).

dermoskeleton = the bones of dermal origin, including scales, teeth, the dermocranum and the dermal pectoral girdle.

dermosphenotic = a superficial dermal bone behind the eye comprising the sixth infraorbital or suborbital; the dermal representative of the autosphenotic. Bears part of the suborbital and sometimes the conjunction of temporal, and supra- and suborbital sensory canals.

dermosupraoccipital = the superficial, paired dermal bone covering the supraoccipital with which it may fuse. In many Teleostei it is a hinge for the skull articulation with the circumorbital ring. Siluridae have a posterior toothed process that secures the nuchal disc. Also called parietooccipital, postparietal or dermal supraoccipital.

dermotrich = dermatrichium.

dermotrichia = plural of dermatrichium.

dermatrichium (plural dermatrichia) = the fin ray, of 4 types:- ceratotrich (in cartilaginous fishes), actinotrich (in cartilaginous and bony fishes), lepidotrichs (only in bony fishes) and camptotrichs (in Dipnoi and Crossopterygii). Spiny rays in Actinopterygii may be called acanthotrichs. Also called dermatotrich.

derogatotype = a joke term in nomenclature for a type purportedly named in a derogatory way for a person, e.g. a parasite, although some of course are named in honour of co-workers.

*Derris* = jewel vine, the plant from which the fish poison rotenone, *q.v.*, is extracted. Also used as the word for the poison.

dervonic acid = docosahexaenoic acid.

descaling = 1) a condition in which a fish has lost a certain amount of scales.

descaling = 2) the removal of scales before cooking. Fins are usually removed first and scales are scraped away from tail to head using the back side of a knife; messy.

descargamento = lean meat from the area of the backbone of unspawned tuna, or any portions of flesh of spawned tuna, except belly flesh (Spain).

*descr.* = abbreviation of *descriptione*, meaning description.

description = a more or less complete statement of the observed characters of a taxon, without any special emphasis on those which distinguish it from other closely related taxa. The original description is the first, formal description of a new taxon required for valid publication.

descriptive name = a name based on the distinctive characters of a taxon, often a series of words in old zoological literature.

descriptive phrase = a name, usually of several words, which at the same time constitutes a diagnosis of the taxon. Not a binomen.

*descriptione* = description, usually appearing as its abbreviation *descr.*

descriptor = a key word indicating the content of a publication.

descriptotype = in nomenclature, that element or elements on which the original description was based.

deserticolous = living in desert regions; more applicable to terrestrial organisms than aquatic ones.

desiccated = completely dried; some specimens in museum collections may suffer this fate.

desiccated cod = small pickle cured cod, or trimmings obtained in boneless cod preparations, reduced to small fibres in a shredding machine and dried.

desiderata = wanted specimens or items.

designated priority = referring to several simultaneously published names for the same taxon, the priority established by the first reviser.

designated unit = an infraspecific group which can be distinguished from the species and which has a different extinction probability.

designation = the act of an author or the International Commission on Zoological Nomenclature in fixing, by express statement, the type of a newly or previously established nominal taxon of the genus or the species group. The original designation is the designation of the name-bearing type of a nominal taxon when it is established. Subsequent designation is the designation of the name-bearing type of a nominal taxon published after the nominal taxon was established.

designation = the original designation is the designation of the type of a taxon when first established while the subsequent designation is the designation of the type of a taxon in a work published subsequent to the establishment of the taxon.

destructive sampling = removal or part or all of a museum specimen for some form of analysis (e.g. molecular work, toxicology) which gives results but destroys the sample.

det. = determiner.

*det.* = 1) abbreviation for *determinavit*, meaning (s)he identified or determined. Often used for identification notes in museum collections.

*det.* = 2) abbreviation for determiner.

detached breakwater = a breakwater (*q.v.*) not attached to the shore.

detention basin = an area that holds water for a limited period as a spillover from a larger basin to prevent flooding. All the water contained in the basin is released a short period of time. Not usually a fish habitat, *cf.* retention basin.

detention dam = a dam for temporary storage of water for later controlled release.

determination = the identification of a taxon or specimen to species or other taxon.

determination slip = a label with a specimen with the species identification, identifier, date of capture, collector(s), etc. The label may be attached to the specimen or with it in a jar or other container. Also called annotation slip.

determinator = the person who makes a determination, usually an expert but sometimes not, so museum records of identity should not always be accepted without verification by an expert.

*determinavit* = meaning (s)he identified or determined. Often used for identification notes in museum collections as the abbreviation *det.*

determine = to make a determination.

determiner = the person who identifies a specimen. Abbreviated as *det.*

deterministic = a process that has no stochastic (random) components, e.g. the population model of some stock assessment methods assumes that population growth due to recruitment follows a deterministic formulation.

detrition = worn away by friction.

detritivore = feeder on detritus.

detritophagy = feeding on detritus.

detritus = 1) debris, disintegrated material or particulate material that enters into an aquatic system. If derived from decaying organic matter it is organic detritus.

detritus = 2) fragments formed by detrition, especially in fish gills.

detritus = 3) dead vegetal matter, faecal pellets and uneaten food forming a greyish gunk on the bottom of aquaria and in filter mechanisms. Rich in nutrients, it promotes algal growth and should be removed. Also called mulm.

detritus pool = the total accumulation of non-living organic matter in streams or rivers.

detrivore = detritivore.

deuterogenotype = one of two or more generic names based on the same type species. Also called isogenotype.

deuterotype = a replacement type specimen.

devalid name = a name that is not valid because it was published before the starting date of the group concerned.

devaluated name = devalid name.

developed fishery = a fishery close to its maximum sustainable yield; a fishery operating at or near the level consistent with ecologically sustainable development in accordance with a management plan.

developing fishery = a fishery that is rapidly increasing often through increased fishing capacity.

development of shoreline = the ratio of shoreline length to the length of the circumference of a circle of the same area as the lake. Important in assessing fish habitat.

devil's elbow = butterfly (an L-shaped steel plate shackled between the dan leno spindle and legs. Also called arm, banana, boomerang, dan leno arm, dan leno bracket, dan leno spreader, spreader bar).

devil's thumb print = a dark blotch on the anterior flank above the pectoral fin of the haddock, *Melanogrammus aeglefinus*. The fish managed to escape the devil's grasp, which left the mark. Also called Saint Peter's mark.

Devon = two or more hooks embedded in a small artificial lure used in trolling.

Devonian = a geological period within the Palaeozoic Era ca. 413-365 million years ago; called the Age of Fishes. Abbreviated as D.

Devon spinner = Devon.

dextral = right-handed, e.g. referring to flatfishes having the right-hand side uppermost.

DFO = number of vertebrae anterior to the dorsal fin origin, e.g. in larval fishes.

dGH = water hardness expressed in degrees of hardness. 0-4 is very soft, 5-8 soft, up to 30 which is extremely hard water.

dh = DH.

dH = DH.

DH = hardness, expressed in degrees (Germany, from Deutsche harte). 1 DH = 17.86 p.p.m.

dhan = the marker buoy used as an anchor from which ropes and nets are set in, e.g. Scottish seining and fly dragging, q.v.

dhow = a traditional Arab sailing vessel, used for transporting fish in the Indian Ocean.

di- (prefix) = two, twice.

dia- (prefix) = across, through.

diacmic = having two maxima, e.g. during a growing season.

diacritic marks = diacritic marks, apostrophes or diaereses are not to be used in a taxonomic name and are to be deleted from such names originally published with them, e.g. the German umlaut sign is deleted from a vowel and should be replaced by an 'e' inserted after the vowel, but only for taxonomic names based on German words and published before 1985.

diadromous = those fishes which regularly migrate between fresh and salt water during a definite period of the life-cycle. Includes anadromous and catadromous fishes, e.g. *Petromyzon*, *Alosa*, *Oncorhynchus*, some *Galaxias*, *Anguilla*, *Sicydium* (Myers, 1949; McDowall, 1968).

diagnosis = a succinct and formal statement of the characters that distinguish a taxon.

diagnoses = plural of diagnosis.

diagnostic character = any character or character state that clearly differentiates one taxon from another.

diagonal file = fish teeth arranged in an in-between direction. Such teeth are at different developmental stages and derived from different tooth bud positions, cf. row and file.

diagonal scale row = the almost vertical row of scales slanting backwards and downwards across the sides of the body. Divided into scales above the lateral line starting at the front of the dorsal fin (from, but not including, the scale in the middorsal row, to but not including, the lateral line scales) and below the lateral line similarly ending at the front of the anal fin. The number of transverse rows themselves along the body may also be counted.

diamond cut = Aberdeen cut (a cut of fish from a frozen block, rhombus-shaped with the sides often squared off or cut with a tapered edge. Usually breaded and battered. Also called French cut).

diamond sinker = an elongate, diamond-shaped lead weight streamlined for trolling. Sometimes with a hook on one end and used for jigging.

diandric = adjective for diandry.

diandry = possessing two different types of males, a large, brightly-coloured and aggressive terminal phase (TP) and a smaller, drab and relatively non-aggressive initial phase (IP), e.g. in *Thalassoma lunare* (Labridae). The TP has priority access to food and spawning females. On the death or removal of a TP, the first-ranking IP becomes the next TP (after first checking the reef thoroughly to make sure the TP is gone). The two pathways of diandry are adult sex change as in monandry and also by direct male development from the juvenile phase with no adult sex change.

diapause = arrested development in the eggs of annual Cyprinodontidae. The temporary pool habitat dries up completely leaving the eggs to develop in the mud.

diaphanous = thin and translucent; semi-transparent.

diaphragm = a membrane between two chambers of the gas bladder which can be opened and closed by circular and radial muscles. Found in physoclist *q.v.* fishes but not Cyprinidae.

diaphragm pump = the most common type of aquarium air pump.

diapositive = a transparent photographic positive, a colour slide, a transparency.

diarthrosis = an articulation that allows free bone movement; *cf.* amphiarthrosis and synarthrosis.

diastema = a gap, e.g. in a tooth row such as in the upper jaw teeth into which a lower jaw canine fits.

diatom filter = diatomaceous earth used to remove very fine particles from the water in aquaria. They clog quickly and are only used occasionally as water polishers rather than continuously.

dib = dab (2).

dibber = a small float with a bulbous tip, made of balsa or a peacock quill, and fished in canal shallows with casters as bait for roach (*Rutilus rutilus*).

dibble = skimming a wet fly leader or a bushy dry fly across the water surface to attract a bite.

diced fish = fish flesh cut into small cubes.

dichotomous key = an identification key using a series of alternative choices, each pair forming a couplet, that eventually lead to a species identity; the usual form of keys for fish identification.

dichotomy = bifurcation (a node in a tree connecting three branches. If one branch is directed or rooted, then one branch represents an ancestral lineage and the other two branches are descendent lineages).

dichromatic = having two colour forms.

dicht = to clean fish and prepare them for cooking (Scottish dialect, archaic English).

diddle = a machine for taking salmon (archaic).

die-off = large numbers of dead fish through natural or unknown factors.

diel = daily, a 24-hour period.

diel vertical migration = a daily vertical migration.

diencephalon = a division of the brain, *q.v.* Major derivatives are the eye cups, the brain pretectal region, the thalamus, hypothalamus and epithalamus (including the habenula and epiphysis).

diet = 1) the food of a fish.

diet = 2) in aquaculture, a balanced mix of nutrients for normal health and growth usually provided on a schedule.

dietary efficiency = the efficiency at which a ration is converted to fish tissue.

dietary gill disease = a disease of fish caused by a deficiency in pantothenic acid.

dieter = 1) a person receiving winter board and accommodation against the promise of cash or service in the next fishing season (Newfoundland).

dieter = 2) a person helping in the preparatory work of the fishing season in exchange for board (Newfoundland).

different kettle of fish = very different from other things mentioned.

differentia = 1) an obsolete term for the character(s) by which a taxon differs from others.

differentia = 2) an obsolete term for the characters that define a species; a definition.

differentiae = plural of differentia.

differential character = a distinguishing or diagnostic character.

differential diagnosis = diagnosis.

differentiation = becoming different in morphology, behaviour, physiology, etc., either within an organism's development or within a lineage of organisms.

diffuse spring = a spring fed by groundwater from many small cracks in the rocks and soil.

Digby chick = not a young bird but whole herring with guts heavily salted and cold smoked for 2-3 weeks until hard (red herring) prepared at Digby, Nova Scotia.

digestibility = 1) the degree to which a particular food can be digested and absorbed by a fish.

digestibility = 2) the nutrients absorbed by a fish, e.g. nutrient intake - nutrient remaining in faeces/nutrient intake, expressed as a percentage.

digestion coefficient = relationship of protein intake in a food to absorbed protein, expressed as a percent.

digestion efficiency = measured as the proportion of food that does not survive passage through the gut.

digestion rate = the time taken to digest food or the rate of passage through the gut.

digestive tract = alimentary canal (the passage through which food passes and is digested and absorbed; includes the mouth, oesophagus, stomach, intestine and anus. Also called alimentary tract and gut, although the latter might be more restrictive being areas of chemical processing and absorption only and not manipulation as with mouth and oesophagus and associated structures).

digit = dicht.

digit bias = a bias arising from the tendency of people to round off numbers to end in 0 or 5; important in angler surveys where catches are recorded from interviews. Also called rounding bias.

digitiform gland = rectal gland (an evagination of the terminal portion of the intestine of Elasmobranchii. Function formerly thought to be related to digestion or excretion, but now considered to secrete high concentrations of excess sodium chloride. Found also in the coelacanth *Latimeria chalumnae*).

dignathic = heterodont tooth morphology, differing in shape in the upper and lower jaws.

dike = 1) a protective wall around a fish pond.

dike = 2) a wall, levee or embankment to prevent flooding.

dilated = expanded.

dilator operculi = a muscle originating on the sphenotic posterior to the levator hyoideus and inserting on the dorsal medial surface of the operculum.

dim fish = dun fish.

dimethyl sulphide = a harmless chemical contaminant of *Scomber scombrus*, derived from eating pelagic snails. It gives an odour of petroleum products.

dimethylsulphoniopropionate = a chemical released by phytoplankton and benthic algae, associated with coral reefs, when eaten. Planktivorous reef fishes use this chemical as a foraging clue. Abbreviated as DMSP.

dimictic = a lake having two seasonal periods (fall and spring) of overturn with free circulation so surface and deep waters mix and the thermocline is disrupted.

dimorphic = having two forms.

dimpling = fish breaking the water surface, to feed on insects or attempting to escape predators, e.g. American shad, *Alosa sapidissima*.

dinghy = a small open boat.

dinglebar troll gear = one or more lines pulled through the water while the vessel is under way. The lines are set and retrieved using a troll gurdy with a weight from which one or more leaders with lures or baited hooks.

dink = 1) bass (*Micropterus* spp., Centrarchidae) too short to meet tournament standards; usually less than 14 inches (ca. 36 cm). Also called baby, throw back, nubbin, pop corn, and slick.

dink = 2) any very small fish.

dinmont = a an immature cod (Scottish dialect).

dinnage = brushwood, branches, boughs, bark, etc, placed as a mat on which dried fish is laid in a vessel's hold or spread on a flake (q.v.) (Newfoundland). Also spelled dennage, dynnage and dunnage.

dinogunellin = lipostichaerin (a toxic lipoprotein found in the Japanese *Stichaeus grigorjewi* (Stichaeidae). Probably analogous to "lipovitellin" in hen egg yolk. Called dinogunellin when the species was placed in the genus *Dinogunellus*.

dioecious = specie sin which the sexes are separate.

dip = 1) a bath treatment in which aquarium fish are immersed in a concentrated treatment solution for a short time to remove parasites or aid in disease cures.

dip = 2) immersion in a chemical solution or additive to improve shelf life and prevent moisture loss of fish prepared as food.

dip = 3) transferring fish from one holding area to another with a net.

dip = 4) the quantity of fish moved in a dip (3).

dip = 5) immersing nets and sails in a tanning liquid as a preservative (Newfoundland).

**dip-net** = 1) a bag-shaped net held open by a square, triangular or rounded frame on the end of a long pole. Used to scoop fish from the water, either on small scale in streams or ponds or commercially from large catches. May be quite large and pivoted on a scaffold or lifted by ropes or pivoted from the end of boat. Also called scoop or scoop net.

dip-net = 2) a net placed on the water bottom or suspended and lifted up when fish swim over it. More correctly lift net.

dip-net fishery = a traditional native fishery for salmonids where fish are captured using long-handled dip-nets, usually at waterfalls or other obstructions, which congregate the fish and make them more vulnerable to harvest.

diphagous = fish that eat in two different ways, e.g. *Chauliodus sloanei*.

**diphycercal** = an internally and externally symmetrical tail fin, e.g. in Dipnoi. May be secondarily acquired from the homocercal condition by loss of the real caudal fin and the gaining of a new one from dorsal and anal elements, e.g. in Gadidae.

diphyllobothriasis = a parasitic, intestinal disease of humans caused by eating raw or lightly processed fish. The parasite is a tapeworm (*Diphyllobothrium*) and man is the definitive host, fish the intermediate host. Also called Jewish housewife's disease or Scandinavian housewife's disease.

diplo- (prefix) = double, twofold.

diplodont = an early form of shark tooth, found in xenacanths for example, characteristically having two prongs or cusps. See also cladodont, hybodont and symmorid.

diplomatotype = 1) a joke term in nomenclature for a type specimen of a taxon described for political reasons.

diplomatotype = 2) a joke term in nomenclature for a type specimen of a taxon named after a person to improve relations, access funds, etc.

diplospondylous = referring to the double vertebrae formed when the anterior and posterior elements (sclerotomes) have not fused, e.g. caudal vertebrae of *Amia*. Two types of centra are present, a precentrum lacking neural and haemal arches and a postcentrum having these arches.

diplospondyly = the condition of a diplospondylous vertebra.

diplostomiasis = infestation of the fish eye by metacercaria of the fluke *Diplostomum* sp., eventually resulting in blindness. Snails are the intermediate host and piscivorous birds the final host. See also eye fluke disease.

diplotype = genoholotype (the primary type of the type species of the genus, designated by the author in the original description of the genus).

dippen net = dip-net (1) (English dialect).

dipping tub = a wooden tub used for immersing cod after being headed, gutted and split in Newfoundland.

dipsey sinker = a teardrop lead weight used for bottom fishing. The shape stops it catching on rocks.

dipsy = the float of a fishing line (Pennsylvania). See also dobber.

dipterex = dylox.

direct length = measurements of body parts are taken as the shortest distance between two points, not around the curve of the body.

direct methods = fishery independent research surveys used to estimate abundance and collect other biological data. Aims to avoid biases found in commercial catch data.

direct reference = a bibliographic reference with full details such as author date, title, publisher, place of publication, volume, issue, pages, plates, figures, etc.

direct runoff = the runoff entering a channel promptly after precipitation.

directed fishery = a commercial effort aimed at catching a certain species or group of species. May also apply to a sport fishery.

Direction = a statement published by the International Commission on Zoological Nomenclature, completing or correcting an earlier decision given in an Opinion, a term now abandoned and replaced by Official Corrections.

dirty = said of transparent sea water in Newfoundland that has abundant large marine organisms which clog nets forming slub (q.v.), but lacks plankton which attract fish. See also clean.

dirty fishing = bycatch (fishes caught incidental to the target species; also called incidental catch or accidental catch. These fishes are usually of lesser value than the target species, and are often discarded. Some bycatch species are of commercial value and are retained for sale. The bycatch often consists of the juveniles of commercial species, and their loss has a deleterious impact on the overall yield obtained from a certain area. In a commercial fishery there are economic discards (fish thrown away for economic reasons, e.g. too small, damaged, not enough commercially value, etc.) and regulatory discards (fish thrown away because of the

regulations as to size or species allowed to the fishery). Fish released alive under catch-and-release management programmes are not considered as bycatch. Also spelled by-catch).

dirty water = green or muddy water with highly reduced visibility; an angling term.

disagreeable name = an obsolete term for an inappropriate name (a name for a taxon that does not reflect a quality or character of that taxon, e.g. a colour or place).

disappearance = the rate of decline in numbers of fish caught as fish become less numerous or less available. Often calculated from catch curves. Abbreviated as Z'.

disarticulated = 1) a fossil where the bones are separated and not together as in life.

disarticulated = 2) said of a fish skeleton prepared in a bug colony (*q.v.*) where the bones become separated after treatment or where bones are separated before exposure to the bugs to facilitate flesh removal.

disc = disk.

disc lamella = one of the flattened overlapping folds derived from fin rays on the head of remoras (Echeneidae) forming the sucker for attachment to other fishes and to whales.

disc teeth = teeth in the buccal cavity of Petromyzontidae.

discard = the part of a fish catch that is thrown overboard, but which may be of important ecological or commercial value. Also the act of throwing fish overboard. The discard typically consists of "non-target" species, damaged specimens or undersized specimens. The fish may be alive or dead, whole or in parts. Estimates of discards are made by observers and logbook records. Also called discarded catch. Discarding lower value fish to increase the value of a catch is called high grading.

discarded catch = the portion of a catch returned to the sea as a result of economic, legal or other considerations.

discard mortality = discard mortality rate multiplied by discarded catch.

discard mortality rate = the proportion of the discarded catch that dies as a result of catching or handling.

discard rate = the proportion of total catch which is discarded. Rates can be for individual species or groups of species.

discharge = flow of water in a river or drainage basin, measured in cubic feet per second (cfs) or cubic metres per second passing a certain point.

discharge area = the part of a catchment where groundwater appears as springs.

disciform = disc-shaped.

disclaimer = a statement in a work, by an author, editor or publisher, that the entire work or all, or specified, names and nomenclatural acts in it are to be excluded for purposes of zoological nomenclature.

disco maggot = a fluorescent-dyed maggot used as bait in angling in Europe.

discoidal = disc-shaped; flat and rounded.

discoidal organ = the modified pelvic fins formed into an adhesive disk.

discolouration = any of suite of abnormal colourings of commercial fish products other than liver stains (*q.v.*), e.g. blackening, browning, bruising, measured by area.

discontinuous zone = D-zone.

discontinuity = 1) an interruption; an obstacle to a stream continuum.

discontinuity = 2) check (a mark on a scale or other hard structure used for aging, caused by cessation of growth and absorption of deposited material due to spawning (hence a spawning check), injury, disease, parasites, or unseasonal lack of food).

discontinuity layer = thermocline (the zone of rapidly changing temperature between the warm upper layer (epilimnion) and the lower cold layer (hypolimnion). Characterized by a temperature change of 1C° or more per metre).

discrete fishery = a fishing region, or a fishery directed to a stock or species.

disgorger = a device of varying form, usually j-shaped with a slotted head to slide over the hook, used to extract hooks from a fish's mouth.

dish = a dish-shaped utensil used in hatcheries.

dished out = 1) a stream bank with an angle greater than 90 degrees. Also called laid back.

dished out = 2) any structure with a scooped out, dish-like form.

disjunct = distinctly separate; said of ranges that are discontinuous so that discrete, but potentially interbreeding, populations cannot interbreed.

disk (disc) = 1) the area surrounding the mouth in lampreys (*Petromyzontiformes*).

disk (disc) = 2) the roundish body of skate and rays (*Rajiformes*) excluding the tail and pelvic fins but including the pectoral fins that merge more seamlessly with the body.

disk (disc) = 3) an adhesive disk modified from the pelvic fins in, for example, clingfishes (*Gobiesocidae*), gobies (*Gobiidae*) and snailfishes (*Liparidae*).

disk drag = a system on fly reels that increases line resistance as a fish pulls it out. The resistance slows down and tires out the fish. The disk system is smoother than a click drag and line breakage is less likely.

disk length = the length from the snout tip to the posteriormost margin of the pectoral fin in Rajiformes.

disk width = the greatest distance between the lateral tips of the pectoral fins in Rajiformes.

dispersal = 1) an accidental migration, the outward spread of organisms from their point of origin.

dispersal = 2) the removal of copies of museum records and databases to a separate building from the originals as a safeguard against loss.

disphotic zone = dysphotic zone.

displacement = the behavior exhibited in an inappropriate situation occurring usually where there is conflict between incompatible instincts, e.g. aggression and flight, or when the external situation necessary for the completion of an activity does not appear (when a female stickleback does not follow a leading male).

disruptive colouration = an irregular colour pattern, often patches of light and dark, functioning as camouflage. The colour pattern disguises the fish's shape by breaking it up into visually distinct parts unlike a fish. Examples include eye stripes and ocelli. Even the stripes on a fish, individually distinctive, blend together and create the illusion of one large fish when schooling.

dissectotype = an unofficial term in nomenclature for a completely dissected type.

dissimilarity = a generic measure of the difference between two objects, measured on a scale of 0 to 1.

dissolved organic matter = minute organic matter.

dissolved oxygen = the amount of oxygen freely available in water and necessary for aquatic life and the oxidation of organic materials. For fish, ideal levels are about 7-9 mg/l and most fish cannot survive levels below 3 mg/l. Cold water contains more dissolved oxygen than warm and water too rich in bacteria and other aquatic organisms may use the oxygen up leaving none for fish. At 5°C brook trout use 50-60 mg of oxygen per hour but at 25°C they require 250-360 mg/hour as their metabolic rate increases. A value of 4-5 p.p.m. of dissolved oxygen is the minimum that will support a diverse fish community and values around 9 p.p.m. are preferred. Abbreviated as DO.

dissolved solids = very small pieces of organic and inorganic material contained in water. Excessive amounts make water less habitable for fish, unfit to drink or limit its use in industrial processes. Abbreviated as DS.

distad = in the direction away from the center of the body; remote from point of attachment, toward the outer edge. Opposite of proximad.

distal = at or near the outer edge or margin. Opposite of proximal.

distance = a measure of the difference between two objects, usually measured on a scale of 0 to infinity.

distance function = a measure of the "distance" between two populations in terms of the differences used in discriminatory analysis.

distant water fishery = a fishery carried out hundreds to thousands of kilometres from the home port of the fishing vessels, e.g. tuna fishery.

distavore = an eater of food from far away, opposite of locavore which is more politically and environmentally correct, e.g. a distavore in North America or Europe would eat Chilean sea bass from South Georgia.

distended scales = erected scales, a symptom of various fish diseases involving swellings such as dropsies.

distensible = capable of being extended or dilated.

distilled smoke = smoke with a high moisture content produced by slow burning wood, used to smoke fish.

distributary = 1) a diverging stream which does not return to the main stream but into another water body.

distributary = 2) a channel taking water from a canal for irrigation.

dystrophic = dystrophic.

disturbance pattern = moving an artificial fly in such a way that it causes a disturbance in the water attractive to fish.

disturbance regime = the characteristics of natural disruptions such as a flood, in terms of timing, duration, intensity, etc.

ditch = a small artificial channel, a permanent or temporary habitat for fishes.

diter = dieter.

ditermous = having two nostril openings, anterior and posterior, the commonest condition in fishes. Monotermous is a single opening.

dither fish = a fish added to an aquarium with shy or nervous fish. A dither fish has a relaxed behaviour which encourages the other fish to come out of hiding or to commence breeding.

diurnal = pertaining to daylight, active during the day; daily.

diurnal inequality = 1) the difference in height of the two high waters or of the two low waters of each day.

diurnal inequality = 2) the difference in velocity between the two daily flood or ebb currents of each day.

diurnal oscillation = the diurnal movement of plankton up and down in the water column, often mirrored by fish feeding on them.

diurnal tide = a tide with one high water and one low water in a tidal day (24.84 hours).

dive-caught = fish caught by hand, hand-held net or spear gun using a snorkel or scuba equipment. Highly selective and least damaging fishery method if carried out responsibly.

diver = in angling, a fly that dives below the water surface and floats back up on the retrieve. Used for bass and pike.

diver gill net = a gill net that drifts along the bottom, its weights being calculated to allow this, e.g. used in rivers for salmon.

divergence = the evolutionary process of branching lineages.

diverse = taxa or biota with many members, a wide range of morphology or of life histories.

diversion = the transfer of water from a stream, lake, aquifer, or other source of water by a canal, pipe, well, or other conduit to another watercourse or to the land, as in the case of an irrigation system. Often deleterious to fish populations.

diversion pond = a pond supplied by water by diversion of a stream.

diversion screen = a wire mesh screen installed where water is diverted from a stream or river to keep fish from entering the diversion channel or pipe. Also called deflector screen.

diversity = 1) a parameter describing, in combination, the species richness and evenness of a collection of species. Low diversity means few species or unequal abundance, high diversity many species or equal abundance. Diversity is often used as a synonym for species richness.

diversity = 2) the absolute number of species.

diversity = 3) variation in a trait or character, e.g. as in morphology.

diversity gradient = a regular change in diversity correlated with a geographic space or gradient of some environmental factor.

diversity index = a measure of the number of species in community and their relative abundances.

diverter = 1) fish diverter (an electrical device that prevents fish from entering sensitive areas, e.g. power dams).

diverter = 2) a ditch made to direct waste water from a given body of water.

diverticulum = an outpocketing or blind-ending tube from a cavity or blind sac.

diverticulum pharyngealis = epibranchial organ (a paired dorsal diverticulum at the posterior limit of the pharynx in certain microphagous fishes. Also called gill-helix, pharyngeal organ, or pharyngeal pocket. In all forms with these organs, except some characids, prominent gill rakers extend into the organ dividing its cavity into two parts, one confluent with the pharynx, and one with the opercular cavity. Small food particles, generally plankton, are retained by the rakers, consolidated by mucus and squeezed out into the oesophagus. Found in Heterotidae, Characidae, Chanoidei, Gonorhynchoidei, Clupeidae and Engraulidae).

divide = used in nomenclature and taxonomy for the removal of a part of a recognised taxon; splitting a taxon.

divinotype = 1) a joke term in nomenclature for a new species collected alive and already bearing a holotype label.

divinotype = 2) a joke term in nomenclature for a type seen only in a seance.

division = 1) a rank that if treated as a division of a genus or subgenus is deemed to be of subgeneric rank for the purpose of nomenclature.

division = 2) a sea area designated for fishery management purposes, e.g. in the northwest Atlantic Ocean the sea is divided into seven subareas indicated by numbers and subareas into divisions indicated by letters, such that 0A and 0B are in Davis Strait while 3LNO covers the Grand Banks and nearby waters off Newfoundland.

djirim = heavily salted and dried flesh of sturgeons, an inferior form of balik (*q.v.*)(former Soviet Union).

DLS = abbreviation for double-layered spiral.

Dn = a photophore in front of and above the eye and the olfactory capsule of Myctophidae.

DO = abbreviation for dissolved oxygen (the amount of oxygen freely available in water and necessary for aquatic life and the oxidation of organic materials. For fish, ideal levels are about 7-9 mg/l and most fish cannot survive levels below 3 mg/l).

do-daudi = a simple drag net used on the Ganges River of India to catch small fishes. Operated by one person at each end having a bamboo pole attached to the net.

do-nothing rig = a rig comprised of a light-wire hook, a bead and a small brass sinker fished in clear water and often left alone. Bait is usually small worms.

doach = a salmon weir on the Scottish River Dee, also the name for the rocky stretch here. Also spelled doagh and dough.

doagh = doach.

doalie = a fisherman (Scottish dialect).

dobber = the float of a fishing line (New York). See also dipsy.

Dobriyal index = cube root of average gonad weight in grammes, used as a measure of reproductive capacity, determination of spawning season, sexual maturity and frequency of spawning (Dobriyal *et al.*, 1999). Unlike the gonadosomatic index (*q.v.*), it does not involve body weight which is dependent on feeding intensity, food availability and environmental and physiological stress.

dobson = large brown aquatic larva of the dobsonfly; used as fishing bait.

dock = the waterway between two piers or a cut into the land for receiving ships.

docosahexaenoic acid = an omega-3-fatty acid found in fish which protects ageing rodent brains from the clumping seen in Alzheimer's disease. This chemical is formed in microalgae of the genus *Schizochytrium* and concentrated up the food chain to fish and other organisms. Chemical name is *all-cis*-docosa-4,7,10,13,16,19-hexaenoic acid. May account for the reduction in risk of dementia and stroke in humans as a diet of fish replaces DHA lost in ageing. Also called dervonic acid. Abbreviated as DHA.

doctor = a parasitic or other copepod which attaches itself to the wound of a fish (Newfoundland).

doctor fish = 1) any of a series of unrelated fish species that are supposedly helpful to other fishes, e.g. tench (*Tinca tinca*, Cyprinidae) slime is said to cure wounds; *Garra rufa* and *Cyprinion macrostomum* (Cyprinidae) in Turkish hot springs in the Kangal area clean dead skin fragments from humans with psoriasis; the circumpolar *Gymnelus viridis* or fish doctor may be a cleaner fish but the reason for its name is unknown.

doctor fish = 2) *Acanthurus chirurgus*, a member of the family Acanthuridae which is named for an extensible spine on each side of the caudal peduncle, resembling a scalpel in its sharpness. The spine is used in defence against predators and in dominance fights with members of its own species.

Doctor Fish Cafe = a chain of cafes and spas in South Korea where doctor fish are available for treatment of skin conditions in people. Spa resorts are now set up in various countries (China, Japan, Croatia, Singapore) with various names (not listed here). See also Fisho.

documentation = additional, supporting evidence on the identification, history, condition, scientific value, catch locality, etc. of a museum specimen or collection. May include paper records, photographs, old labels, field notes, other museum's catalogue data, etc.

doe = female salmon (in British Columbia).

dog hold = the hatchway in a jack-boat (*q.v.*) from which a man fishes (Newfoundland).

dog buoy = a buoy used to float fishing nets made from a dog skin. Dog skin lacked pores and was easily sealed with tar, e.g. used on the Moray Firth in Scotland.

dog ear = triangular pieces of netting fixed into the angle formed by the forward edge of a trawl having all bars along the hanging end points on the wings.

dog fishing = the Ainu of northern Japan taught their dogs to catch migrating salmon. The dogs are called Ainu dogs or Hokkaido inu.

dogfish = 1) common name for various shark species, usually members of the Squaliformes which has about 100 species. Some species have commercial importance. The name may come from the fish being deemed unsuitable for human consumption but suitable for dogs or from the large schools of dogfish which fishermen called "packs".

dogfish = 2) a term of opprobrium applied to people.

dogfish head bones = chewed, these are folk cure for kidney troubles.

dogger = a two-masted fishing vessel, used by the Dutch.

doitsu = ornamental carp or koi (*q.v.*), with two lines of mirror scales.

dol net = a stationary net resembling a trawl using tidal flow to capture fish in India.

dole-fish = the share of fish allotted to each one of a company of fishermen in a catch.

doling = a fishing boat with two masts, each carrying a sprit-sail (Sussex dialect).

Dolly Varden = 1) the salmonid, *Salvelinus malma*, named for a female character in Charles Dickens' *Barnaby Rudge* who was colourfully dressed. A pink-spotted calico was called Dolly Varden during Dickens' visit to North America and the charr was likened to the material.

dolly varden = 2) a large earthenware crock used by fisherman in Newfoundland to drink tea.

dolphin = 1) one of a group of species of marine and riverine mammals.

dolphin = 2) confusingly, a fish, *Coryphaena hippurus* (Coryphaenidae).

dolphin-friendly tuna = tuna caught for food by methods that do not entangle or drown dolphins in the fishing nets.

domed-top float = a stick float used in angling for its greater visibility at distance. Also more buoyant and stable for fishing over depths.

domestic annual harvest = the domestic annual fishing capacity, modified by such factors as economics, which will determine estimates of what the fishing fleets will harvest.

domestic annual processing = the amount of fish that will be processed domestically, based on physical capacity but including such variables as demonstrated intent, markets, other fisheries, the effects of domestic harvesting, etc.

domestic fishery = 1) a fishery within national waters operated by nationals.

domestic fishery = 2) fishing for domestic consumption, subject to regulations.

domestic observer = privately employed individuals placed aboard fishing vessels to insure the legal catch of different commercial fish.

domesticated fish = a fish selected and adapted for aquaculture, for the aquarium or for pond keeping.

domhof knot = a knot used in angling to tie spade-end hooks to line. Various websites have animated steps showing how to tie this knot.

dominant = 1) the most numerous species in a community at a given time.

dominant = 2) used to describe a male fish which is the chief spawner and which endeavours to exclude other males from the spawning act.

dominant year class = a year class that predominates in the fishery, often continuing over several years.

domoic acid = an amino acid which is a neurotoxin. Found in algal blooms and can be eaten and concentrated by fish and transmitted to humans eating the fish.

donkey = a wooden barrel or cask for the export of dried and salted cod (Newfoundland).

donor = a person or organisation which has given a specimen or collection to a museum.

doondie = 1) a large lean cod (Orkney and Shetland dialect).

doondie = 2) a diseased cod (Orkney and Shetland dialect).

doondie = 3) a cod after spawning (Orkney and Shetland dialect).

door = 1) the entrance to a fish trap.

door = 2) a large, steel or alloy, door-shaped structure attached to the wire in front of a net (such as a trawl) to spread the net open by hydrodynamic action.

door legs = backstrop (a short wire or chain system between the otter board and bridle on an otter trawl. Also called backboard becket, backstrop, board bridle, board leg, board strop, door strop and sling).

door sling ring = backstrop link (a triangular steel link with rounded corners on the back of a trawl's otter board. The backstrop is attached here. Also called board link, shearboard link and VD link).

door strop = backstrop (a short wire or chain system between the otter board and bridle on an otter trawl. Also called backboard becket, backstrop, board bridle, board leg, board strop, door legs and sling).

doormat = a large flounder.

doorway = door (1).

dopefish = a video-game fish that came to be an in-joke in that industry. It first appeared in the fourth Commander Keane game, *Secret of the Oracle* (1991). The fish is green with buck teeth and is the second-dumbest creature in the universe after the Ravenous Bugblatter Beast of Traal of the Hitchhiker's Guide to the Galaxy.

doppel zentner = 100 kg. Abbreviated as dz.

dor-line = a mackerel line (archaic).

dorie = a lead sinker on a mackerel line (Scottish dialect). See also dorro-bullet.

dorro (noun) = 1) a trailing cord with hooked lines attached used in catching cod, mackerel, ling, etc., jigged while the boat is rowed slowly along (Scottish dialect).

dorro (verb) = 2) to fish with a dorro (Scottish dialect).

dorro (verb) = 3) to fish in shallow water with a floating hand line (Scottish dialect).

dorro = 4) a wooden frame on which fishing lines and hooks are wound (Scottish dialect). See also grind.

dorro-bullet = a lead sinker at the end of a mackerel line, usually in the shape of a bell (Scottish dialect).

dorsad = above; toward the back; dorsal to.

dorsal = of or pertaining to the back, usually the upward side of a fish (except in flatfishes where the side uppermost in adults is a flank). Often used as an abbreviation for the dorsal fin. Opposite of ventral.

dorsal aorta = the principal, unpaired median artery of the trunk, extending into the tail as the caudal artery. Branches from this artery serve the viscera and the body muscles.

dorsal blade = a keel-like, medial structure anterior to the dorsal fin formed from the dorsal fin radials, e.g. in Sternopychidae.

dorsal cerathyal = epihyal (the deep, endochondral bone at the upper end of the hyoid arch below the interhyal. It joins the hyomandibular and the symplectic through the interhyal, and articulates with the ceratohyal by a suture in some fishes, e.g. Gadidae. May bear a dentigerous plate. Also called posterohyal. It is called dorsal ceratohyal as it is considered to be the dorsal ossification of the ceratohyal. May or may not be homologous with the epal element of the branchial arches).

dorsal ciliated groove = hyperpharyngeal groove (the longitudinal ciliated groove on the upper wall of the pharynx which sweeps food particles to the oesophagus in Amphioxus and in the ammocoetes stage of Petromyzontiformes).

dorsal field = the uppermost area on a fish scale, between the anterior and posterior fields. Also called lateral field.

dorsal fin(s) = the unpaired fin(s) on the midline of the back. Also called the notopterygium. In Pleuronectiformes it is on the opposite side to the anus. In Centriscidae the hind end of the fish has been rotated under the fish so the dorsal fin is on the under surface. Abbreviated as D, D1, D2, or D3 respectively for the only, first, second or third dorsal fins (or their rays and spines). It functions to prevent rolling.

dorsal fin base length = the distance between the origin and the insertion of the dorsal fin; the length of that portion of the dorsal fin in contact with the body.

dorsal fin depressed length = the distance from the origin to the farthest posterior tip when the fin is flattened back down against the body.

dorsal fin height = the distance from the origin of the fin to the tip of the anterior lobe. Sometimes measured as the greatest vertical distance from the base.

dorsal fin ray count = enumeration of the dorsal fin rays. In fishes where the smaller rays in front gradually grade into larger rays, these smaller anterior rays are included in the count, e.g. Ictaluridae, Esocidae, Gadidae. Where the first small rays abruptly change to larger ones or where the first small rays are very variable or difficult to count these are not included; the first unbranched ray reaching nearly to the tip of the fin and the remainder of the rays are then counted - this is called the principal ray count. Where the last two rays are closely approximated at the base some authors consider them as a branched ray counting them as one (although they are not really a single branched ray). In fishes where the last two rays are not closely placed at the base, the rays are usually both counted. However some authors again count the last two rays as one. In some studies, only the branched rays of the dorsal fin are counted. It may readily be seen that if published counts are to be of use to others the method of counting should be stated. Dorsal fin spines, when present, are usually enumerated separately from soft or branched rays. The dorsal fin may be comprised of two connected parts, spiny and soft, counted separately, or there may be two dorsal fins, the first spiny.

dorsal rib = epipleural bone (rib)(one of a series of bones found in the horizontal septum (separating the upper and lower muscle masses of the body - epaxials and hypaxials). Epipleural ribs may be associated with the anterior pleural ribs, e.g. in *Perca* or the vertebra, e.g. in Gobiidae. Also called intermuscular bone).

dorsal stripe = the longitudinal arrangement of melanophores found along the dorsal side of the embryo underlying the median fin fold. The melanophores are in the midline of the anterior trunk and tail and are in two rows in the head and posterior trunk.

dorsel = a pannier in which fish were carried on horses (obsolete).

dorsicrania = plural of dorsicranium.

dorsicranium (plural dorsicrania) = a collective term for the endochondral and membrane bones of the dorsal skull region.

dorsohyal = dorsal hypohyal (see hyoid arch).

dorsolateral = between the back and the middle of the side, the upper area of the side.

dorsonasal photophore = light organ above the nasal aperture in front of the eye in Myctophidae. Abbreviated as Dn.

dorsotype = a joke name in nomenclature for a type specimen mounted in such a way that only its dorsal surface is visible for study.

dorsum = the back or upper surface.

dory = a small, flat-bottomed, flared side and open but very stable rowboat often used in trolling and jigging. In Atlantic Canada, these 15 foot boats could be stacked on the deck of schooner and easily lowered over the side when the fishing grounds were reached. Two men fished from a dory, which could hold their gear, the catch and some food and water. A small sail could be raised. Each man operated 10 lines in the cod fishery, the lines being 52-55 fathoms long. The lines were connected together to form the trawl, 20 lines long or about one mile in length. Hooks were attached by gangings (branch lines), about 3.5 feet apart for a total of 1800 hooks on each trawl. The trawl was anchored at each end, marked by buoys. When the lines were hauled in by under-running (*q.v.*), one man removed the fish from the hooks and the other man re-baited them. Four sets would be made in a day. Dories were replaced by automated trawls in the 1960s but are still used inshore and as tenders.

dory banker = the dory used on the Grand Banks, Newfoundland.

dory banking = fishing with dories on the Grand Banks, Newfoundland.

dory boat = a larger form of dory used on the Grand Banks, Newpoundland, equipped with a 3-5 h.p. engine.

dory buff = yellow, the colour dories were often painted.

dory fishing = see dory.

dory hat = a waterproof hat with the brim the same size all around.

dory hook = part of the tackle used to lower a dory into the water and hoist it back onto the ship.

dory jig = a hook forming part of the hoisting tackle. See dory hook.

dory man = a fisherman who used dories.

dory master = the person in charge of the dory while it was away from the main vessel.

dory mate = fishermen who operated a dory together.

dory piggin = a bailing device, shaped like a dustpan, used to remove water from a dory.

dory pin = pegs on the side of a dory to keep the oars from sliding around.

dory schooner = the large vessel carrying dories for the Newfoundland cod fishery.

dory scoop = dory piggin.

dory skipper = the owner of a dory.

dosing pump = a pump which can supply a very slow drip used to add trace elements or make up water lost from evaporation in aquaria. The most common type is a peristaltic pump.

dosse = a pannier in which fish are carried on horseback (Sussex dialect).

dorsel = dosse.

dotting = in angling, the addition of small lead weights (shot) to the line so that only the tip of the float is visible above the water surface.

double bagging = splitting a catch in two when the catch is too heavy to deal with as a single unit.

double beam trawl = two beam trawls towed by one trawler.

double blood knot = a knot used in angling to tie together two pieces of line of similar or dissimilar diameters. Various websites have animated steps showing how to tie this knot.

double codend = two codends joined at the leading edge. Used on rough grounds to reduce the chance of total loss of a catch.

double cropping = having two populations in an aquaculture pond, cropped simultaneously or alternately, one of the crops not necessarily being fish.

double ebb = a tidal ebb current having two maxima of velocity separated by a smaller ebb velocity.

double emarginate = a caudal fin pointed at the end in the mid-line with the margins above and below that point indented.

double fillet = block fillet (a fillet comprising muscle mass from the side of the fish, usually joined at the back or belly. Also called angel fillet, butterfly fillet, etc.).

double flood = a tidal flood current having two maxima of velocity separated by a smaller flood velocity.

double half-hitch = a knot for tying up a boat. Bend the line around a post or through a ring and then pass its end over or under the standing part and up through the loop formed by the turn; doing this twice makes the double half-hitch. Various websites have animated steps showing how to tie this knot.

double haul = a fly cast where the angler quickly pulls and releases the line on both the back cast and the forward cast creating a greater line speed and casting farther or cutting through wind.

double hook = a hook with two points used in trolling.

double linnet = the overlap of netting formed when a cod trap is drawn to the surface (Newfoundland).

double loop clinch knot = a knot used in angling for tying on swivels when trolling. Various websites have animated steps showing how to tie this knot.

double mark = double zone (two rings on an otolith that are close together relative to the size of the calcified stricture and the distance between two annuli. Considered as one annulus).

double mesh = net mesh made with double twine where special strengthening is necessary.

double nail knot = a knot often used in saltwater fly-fishing to join leader sections of the same or slightly different diameter, being less bulky than a blood knot when using heavy leader material. A nail is used to help form the knot. See also nail knot and offset nail knot. Various websites have animated steps showing how to tie this knot.

double naping = cutting through both sides of the body wall of a fish.

double pump = the process employed by fish to move water over the gills for oxygen and waste exchange. The jaw and mouth are lowered and expanded, inhaling water into the oral pump or mouth cavity. Movement outward of the operculum expands the opercular pump or cavity and valves prevent a backflow of water. The two pumps are coordinated to provide a smooth flow of water over the gills.

double rigging = using outriggers to tow 2-4 trawls at once.

double ring = double zone (two rings on an otolith that are close together relative to the size of the calcified stricture and the distance between two annuli. Considered as one annulus).

double stick net = a form of scoop net with netting strung between two sticks and usually operated by one person. Used like a skimming net, *q.v.*

double surgeon's knot = a knot used to attach aippet to a leader in fly fishing. A loop is made, a single overhand knot tied, and doubled. Various websites have animated steps showing how to tie this knot.

double taper = a fly line reduced in diameter on both ends; when one end wears out it can be taken off the reel and the other end used. Available in floating and sinking styles and good for short to moderate length casts and for roll casting.

double tide = a high water consisting of two maxima of nearly the same height separated by a relatively small depression, or a low water consisting of two minima separated by a relatively small elevation.

double truncate = a caudal fin pointed at the end in the mid-line with the margins above and below that point straight.

double turl knot = used on large flies or tippets as a single turl knot using synthetic lines tends to creep out because of their smooth finish. Various websites have animated steps showing how to tie this knot.

double zone = two rings on an otolith that are close together relative to the size of the calcified stricture and the distance between two annuli. Considered as one annulus. Also called double ring and double mark.

double-ender = a type of boat used in fishing, having a sharp stern as well as a pointed bow. Fishermen believed that following seas would not swamp such a boat, although this did not always work out in practice. Such boats were hauled up on the beach, e.g. in the Gaspé region on the south shore of the St. Lawrence River, and having a pointed stern made them easier to launch through surf. The Gaspé boat, Tancook whaler and Labrador boat are of this type.

double-frozen = fish frozen at sea then thawed for processing onshore and then re-frozen. Also called twice-frozen or refrozen.

double-layered spiral = a material made by rolling up a polyester pad and plastic wire mesh. It is used in both biological and mechanical filters in aquaria.

doubtful name = *nomen dubium*.

dough = doach.

dour = reluctance of fish to bite (Scottish dialect).

douse the killick = lowering an anchor with float attached to indicate occupancy of a particular fishing ground (Newfoundland). See also throw away one's grapnel.

douser = a device used to drive fish in a desired direction by thrashing the water (Newfoundland). See also dasher, thrasher and trouncer. A douser was a twelve or fourteen inch bolt of iron with four iron rings fastened through the bolt at three or four inch intervals. Dousers were bounced off the ocean floor to drive cod into the bag of a seine. Often, four or five douser were used at a time.

Dover cut = American cut (fish portions or fillets with tapering or beveled edges, rather than square-cut sides).

Dover sauce = Berwick sauce (the water in which a salmon has been boiled, served as a sauce).

Dover sole goujons = goujonettes de sole (sole filets baked or fried in bread crumbs and a light batter; the origin of fish sticks, *q.v.*).

dow = fish that are not fresh or that have been drying for a day or two (Scottish dialect).

dowe = dow.

down = 1) in the Newfoundland fishery, a location further out to sea, e.g. down the shore.

down = 2) in the Newfoundland fishery, describes the direction north so any place to the north of a particular location is down from it, e.g. down on the Labrador, down north.

downer = a steelhead salmon returning to the ocean. Also called snake.

downrigger = 1) a metal structure resembling an oversized fishing rod mounted on a boat and capable of being raised and lowered. Used to present lures in deep water on tight lines.

downrigger = 2) an electric or hand-powered winch used to lower a wire line with a cannonball (heavy weight) to a selected depth; a fishing line from a separate rod and reel is attached with a quick release clip. When a fish is hooked, the fishing line is released from the downrigger mainline so the fish can be played on tackle without a weight.

downrigger ball = a cannonball-shaped device with a fin used to keep a trolled bait far beneath the boat.

downriver = kelt (a spawned out or spent *Salmo salar* or other salmonid up until the time it enters salt water. A name used in British Columbia. Also called dropback).

downrunner = a fish returning to sea after spawning, e.g. American shad, *Alosa sapidissima*.

downshotting = dropshotting.

downstream = in the direction of water flow.

downstream angler harvest = that portion of a watershed's harvest that is taken downstream of the watershed.

downstream drift = allowing a fly to drift past the angler and rise to the surface downstream.

downwelling = a downward movement of surface water caused by onshore transport, converging currents, or dense water overlying less dense water. May carry fish to lower depths.

drab = a colour description of fish or body parts, meaning dull grey to yellowish brown, light olive brown or khaki, or faded and dull.

draft = 1) an old measure of dried, salt cod for sale, two quintals or 224 lbs or 101.6 kg. Also called draught.

draft = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for eels.

draft barrow = 1) a flat, rectangular wooden frame with handles at each end for two men to carry dried cod (Newfoundland).

draft barrow = 2) a draft barrow frame used in weighing fish (Newfoundland).

draft netting = encircling fish with a net deployed from shore by a boat and then hauled into shore. Use to catch salmon in estuaries, especially in Ireland.

drag = 1) a device in the mechanism of fishing reels that puts pressure on the line as it is pulled off the reel, allowing a hooked fish to pull line without breaking it, and to restrain a running fish. Also called slipping clutch.

drag = 2) movement of an artificial fly at a rate different from the water current causing the line to form a v-shape at the surface and discouraging fish from biting.

drag = 3) to pull fishing gear through the water.

drag net = pull net (any net where fish are caught by horizontal dragging, e.g. seine, trawl, scoop net).

drag seine = beach seine (a net used to encircle fish in shallow water; usually operated by two people wading out from shore, the net has lead weights to keep the bottom on the sea floor and floats to keep the top of the net at or near the surface; there may be a bag extending back from the centre of the nets length to increase capture efficiency. The seine may be set from a boat but hauled in from the land. Also called shore seine, draw net, haul seine, yard seine and sweep net).

dragger = a trawler, a fishing boat that uses a trawl net or drag net to catch fish. Of varying sizes with a small crew of about three to eight people. The trawl is usually worked from the starboard side from winches geared to the main engine of the vessel.

dragger trawl = otter trawl (a towed net that strains demersal fish out of the water. Rectangular otter boards of wood or steel on the tow ropes plane through the water and help keep the mouth open and give the trawl its name; floats on the headrope and weights on the ground line also assist in this).

dragging = the operation of a trawl (a bag-shaped net towed behind a ship either along the sea floor or in midwater, having a buoyed head rope and a weighted foot rope to keep the net mouth open).

dragman = a fisherman who fished by dragging a net along the bottom of the water (archaic).

dragnet = drag net.

drail = 1) a heavy, boomerang-shaped lead weight with a ring at each end used as a keel when fishing in deep water.

drail = 2) a heavily-weighted hook and line used for dragging in deep water.

drailing = 1) trolling for mackerel with hook and line while under sail.

drailing = 2) drunk emailing.

drain = a ditch allowing improved drainage from fields, either artificially constructed or a modified natural watercourse. Often a habitat for fishes. Drains may also be a closed system of tiles buried in the ground.

drain box = monk (a weir structure used to regulate water depth in a pond with a screen to retain fish).

drain channel = a system for draining water; often a habitat for fishes either temp or permanently.

drain water = water drained off, especially by an artificial drainage system.

drain-bulk = a stage in the curing of cod in Newfoundland in which the split and salted fish are laid in piles to drain before being moved to the flake (*q.v.*) to dry.

drainable pond = a pond from which the water can be taken out, but not to an extent that eventually enter the sea or the main chbasin. Includes any ponds or lakes.

drainage basin = the total surface land area drained by a stream or river; often used in the sense of the water bodies in the basin. Not a watershed which is strictly an elevated boundary area separating tributaries draining to different river systems.

drainage ditch = drain channel.

drainage lake = a lake fed primarily by streams and with outlets into streams. Such a lake has a shorter residence time than a seepage lake and is more subject to surface runoff problems.

drainage system = several types of drainage system for rivers are recognised, namely annular, dendritic, deranged, parallel, rectangular and trellis (all *q.v.*).

draining = draining surplus brine from a brined fish by leaving the fish hanging. Also called dripping.

draught = 1) draft.

draught = 2) a catch of fish in one drawing or pulling in of a net.

draught = 3) the act of drawing in fish.

draught = 4) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

draught = 5) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for salmon.

draught bar = draught barrow.

draught barrow = a flat wooden barrow with handles for two people, used mainly for carrying dried fish in Newfoundland, slightly larger and stronger than a hand barrow for carrying a draught (two quintals) of dried fish and was used mainly on mercantile premises. Also called draught bar.

draught of fish = a haul of fish.

drave = a shoal of fish (archaic).

draven = decomposed, rotten or decayed fish (Scottish dialect). Also spelled dravin.

dravin = draven.

draw = 1) a tributary valley or gully, shallower than a gorge, and usually having water only after rain. Not usually a fish habitat.

draw = 2) to haul in a fishing net.

draw = 3) the selection by lot of a fishing location in the inshore fishery of Newfoundland.

draw = 4) to take fish out of pickle preparatory to washing and drying (Scottish dialect).

draw = 5) to catch fish with a handline.

draw net = beach seine, *q.v.*, or a trawl, *q.v.*

drawdown = the release of water from the reservoir of a dam for power generation, flood control, irrigation or other water management activity. Also the vertical distance the water is lowered or the reduction in the pressure head. Often with deleterious consequences for fish both within the reservoir and downstream.

drawdown zone = the shore zone between full and lower levels in a reservoir.

drawing a red herring across the path = trying to divert attention from the main question by some side-issue. Derived from the use of a red herring drawn across a fox's path, destroying the scent and leading the hounds astray.

drawing twine = the small mesh of the bunt in a cod trap where the fish collect when the trap is hauled to the surface (Newfoundland). See also drying twine, drawing up area and drying up area.

drawing up area = drawing twine.

drawn = eviscerated. Drawn fish may still need to be scaled.

dream fish = a *Kyphosus* species (Kyphosidae) of Norfolk Island, hallucinogenic if eaten because of dimethyltryptamine content.

dreams of fish = a dream seeing fish in clear-water stream shows favour from the rich and powerful; dead fish signifies loss of wealth and power through some disaster; eating fish denotes warm and lasting attachments, etc.

dredge barrow = barrow (a flat, rectangular wooden frame with handles at each corner, made for two men to carry cod. Also called fish barrow and drudge).

dredging = 1) the removal of material from the bottom of water bodies using a scooping machine. This disturbs the ecosystem and causes silting that can kill fish.

dredging = 2) retrieving a crankbait such that it digs into the bottom, stimulating strikes by fish.

dress = the process of dressing (1).

dress gang = the group on a fishing vessel responsible for cleaning, dressing and salting fish.

dress-out percentage = the percentage weight of the whole fish remaining after removal of the viscera, and sometimes also the head and tail as well.

dressed = 1) a fish with viscera, head and tail removed (some fish may have the tail on) but with skin and bone retained. Some dressed fish may have scales removed. A kitchen-ready fish. See also dressing.

dressed = 2) a lure or jig with feathers, fur, plastic or other additions meant to attract fish.

dressed green fish = split fish ready for washing and salting (North America).

dressed or dressing weight = the weight of a dressed fish, *q.v.* Fish are usually dressed at sea. Abbreviated as DWT.

dressing = the process of preparing fish and game for eating. Fifteenth century words no longer in use for fish include:-

bined = sole,

chined = salmon,

gobbetted = trout,

sauced = tench,

sided = haddock,

splated = pike,

splaved = bream,

toucheden = eel, and

tusied = barbel.

drew = 1) in knitting or making a fish net, a certain number of meshes formed in a row.

drew = 2) a quantity of dried and salted cod equal to the length of a storage pound.

dibble = a very small, barely continuous stream (Newfoundland).

driddle = dribble.

dried fish = fish preserved with a water content less than 25% (no bacterial growth) and 15% (no mould growth).

dried salted fish = fish preserved by salting and drying. Works best with non-fatty fish.

dried-up pond = a pond from which water can be totally removed, leaving the bottom available for cultivation, thus making the pond more fertile when refilled.

drier = fish flake (a rack on which fish are dried, often of spruce boughs on a framework of poles in North America).

drift = 1) to be carried along by water currents.

drift = 2) displacement by currents of invertebrates and plant material which is seized on by fish as food drift organisms.

drift = 3) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

drift anchor = an anchor in the water column like a kite that slows the movement of an angler's boat through a fishing area.

drift bay = drift anchor.

drift boat = a river fishing boat with a flat bottom, rigid hull and upswept prow about 14-18 feet long. Also called a Mackenzie River dory.

drift castnet = a castnet in which half is lowered into the water from a boat, the other half resting on the gunwhale. The boat drifts with the current which keeps the net open. When the fisherman feels a fish touch the net through the vibration of a rope attached to his foot, he releases his hold on the net so it falls to the river bottom, trapping the fish.

drift current = a broad and shallow, slow-moving current in a lake or the ocean.

drift fish = drift food.

drift fishing = 1) using a series of gill nets which are allowed to drift in the open ocean.

drift fishing = 2) angling from a boat allowed to move with the current, wind or tide.

drift fishing = 3) casting a weighted bait upstream and allowing it to drift downstream. The weight and bait bounce along the bottom.

drift food = fish washed up on shore, e.g. capelin (*Mallotus villosus*) and cod (*Gadus morhua*) in Iceland where they drift-fish rights (*q.v.*) existed.

drift line = drifting longline.

drift maker = a person who made drift nets (archaic).

drift net = an unanchored gill net floating free with water currents or attached to a boat. Lost drift nets continue to catch and kill fish and marine mammals (called "walls of death") and large ones (50 km large scale pelagic driftnets) have been curtailed or banned on the high seas since 1991 by the Wellington Driftnet Convention and the 1993 UN General Assembly moratorium on large-scale drift nets. Also called drift gill net.

drift of fish = a concentration of cod (Newfoundland).

drift sinker = a lead weight that is attached to a fishing line and drifted, dragged or retrieved across the bottom. Available in various patterns.

drift sock = a large, sock-shaped, drift anchor.

drift-fish right = the allocation of the right to collect fish washed on shore, e.g. in 12 century Iceland where this fishery was crucial to survival in late winter when food supplies ran low and sea fishing was not possible because of the adverse weather conditions.

driftage = material that has been carried or deposited by a water current.

drifter = a vessel fishing with drift nets.

driftfood = drift food.

drifting fish aggregating device = natural or artificial free-drifting objects that attract pelagic fishes, such as tunas. Natural ones are logs and branches and objects of human origin such as oil drums and buoys. Artificial ones are deliberately constructed, such as bamboo rafts with purse-seine corks to aid in flotation and strength and with netting hanging down to act both as a drift anchor and as a concealment for smaller fishes. Artificial devices can have a radio or satellite-linked transmitting buoy so it can be located by fishers.

drifting longline = a longline kept near the surface or at a certain depth by means of regularly spaced floats. Drifting longlines may be of considerable length, and the snoods are usually longer and more widely spaced than for the bottom longlines. Some drifting longlines are set vertically, each line hanging from a float at the surface. They are usually worked in groups of several lines operated by a single boat. Also called drift line.

driftophagy = feeding on drift, e.g. Salmonidae.

drilled bobbin = a light-weight, hollow bobbin on the footrope of a bottom trawl with holes to allow flooding. Also called alloy bobbin.

drilling = mixing fish and salt by stirring in a trough so as to better incorporate the salt with the blood and juices (Scottish dialect).

drink like a fish = to drink too much alcohol.

drip = shrink (loss of weight in fish due to fluids draining from the food product. Also called purge).

drip bag = a device allowing the slow drip of pogey oil (*q.v.*) from a boat to attract fish.

drip incubator = an incubator used for water-hardened trout eggs where water drips from one tray to the next.

drip loss = liquid exuding from fish flesh when thawed.

dripping = draining surplus brine from a brined fish by leaving the fish hanging before smoking. Also called draining.

drive-in fishery = a net set usually in rocky or reef areas where active gear cannot be used, and/or where fish numbers entering passive nets is low, or where fish captured by a passive net would soon die as in tropical waters. Fish are driven into the net by various means such as beating the water with poles or using frightening lines (*q.v.*).

drive-in net = a lift net or pouch net into which fish are scared.

droch = drove.

drogue = 1) the British term for the American sea anchor, namely a drag, usually a canvas-covered conical frame, floating behind a vessel to prevent drifting or to maintain a heading into the wind.

drogue = 2) drove.

droke = a steep-sided valley with a small stream (Newfoundland). Also spelled droch, drogue (2) and drook.

dromous = running in a direction, used with prefixes for describing fish migratory habits, e.g. anadromous, catadromous.

droo = drew (1 and 2).

drook = drove.

drop back indicator = a device to detect a hooked fish swimming towards the angler - normally the line goes slack and the movement cannot be detected. The indicator can be electronic with a beeping alarm or a simple clip. The indicator is positioned on the rear bank stick and a free

hanging open clip is hooked onto the line between the reel and the first rod guide. A fish swimming away from the angler pulls the clip up while one swimming towards the angler will cause the clip to drop down.

drop line = a handline used without a rod for catching fish.

drop loop = a high strength knot forming a loop off the main fishing line used to attach sinkers. Various websites have animated steps showing how to tie this knot.

drop shot = a hook tied directly to the fishing line from a few centimetres to a metre or more above the sinker. The hook is tied such that it is at a 90° angle to the line with the hook point up.

drop-net = 1) a net that catches fish by dropping, without being cast.

drop-net = 2) a modified fyke net used in winter.

drop-off = a rapid increase in water depth, an underwater precipice.

dropback = kelt (a spawned out or spent *Salmo salar* or other salmonid up until the time it enters salt water. A name used in British Columbia. Also called downriver).

dropline = a deepwater fishing method involving the use of a weighted vertical line bearing rows of baited hooks, operated by hand or by a mechanical device.

dropout = fish that fall out of a net while it is in the water or while it is being hauled in. The fish are often injured or dead and may be numerous.

dropper line = a short branch line from the main fishing line carrying hook and bait.

dropper loop = the knot forming a dropper line. A loop is formed above the sinker, standing out at right angles to the line. Various websites have animated steps showing how to tie this knot.

dropper shot = in angling, small lead weights spread out along the line between the hook and the float or hook and the bulk shot. They serve in bite detection as the float is very sensitive to any movement of the hook and bait.

dropshotting = a hook is tied on a line with a Palomar knot, the line looped through the eye from the top and, instead of being trimmed off, a section 6-24 inches long is left with a weight at the end. Looping the line through the eye leaves the hook point up. Also called downshotting.

dropsy = a swelling of the fish's body usually caused by bacterial infection, and also by viral infection, osmoregulatory problems, a flagellate protozoan (*Hexamita*), aggravated by poor environmental conditions. Serous fluid accumulates in any body cavity. Other symptoms are lethargy, gasping, increased respiration, colour loss, skin ulceration and exophthalmia. Also called pinecone disease and vertical scale disease because the scales stick out, and ascites.

drought = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

drouth = to dry as in fish curing (Scottish dialect from English drought).

drown a fish = 1) a French expression (noyer le poisson) occasionally seen in English, meaning to argue over and over about a subject in order to confuse the listener; to hide, dilute or cloud the truth.

drown a fish = 2) in angling, to bring a fish to the surface so its head emerges in order to tire it out for capture.

drowned = losing control of a fishing line so that is it is extended in a long curve, making it difficult to pull in a hooked fish (Scottish dialect).

drowned fish = dead fish; used of food fish discarded as unsuitable for sale.

drowned river = a former river inundated by a rise in sea level, now an estuary or covered by the sea.

drudge = 1) a drag-net used in fishing (Newfoundland).

drudge = 2) to catch herring (Newfoundland).

drudge = 3) to sprinkle salt on herring as a preservative (Newfoundland).

drudge bar = drudge barrow.

drudge barrow = barrow (a flat, rectangular wooden frame with handles at each corner, made for two men to carry cod. Also called fish barrow).

drug residues = in food inspection, residues of therapeutic drugs used during the rearing of farmed fish.

drum = 1) a fixed net, similar to a fyke net (*q.v.*) except that there is only one funnel leading to the codend and there are usually two wings. The net is usually checked several times a day by pulling up the drum section of the trap and emptying the fish from the codend.

drum = 2) a member of the drum of croaker family (Sciaenidae), named for the use of the swimbladder as a drum or resonating chamber to produce sound by the action of drumming muscles.

drum = 3) a cylindrical wooden container in which dried and salted cod from Newfoundland were packed for export to South America.

drum = 4) to pack dried and salted cod into a drum (Newfoundland).

drum = 5) a quantity of fish packed in a drum (Newfoundland).

drum fish = the quality of fish prepared for the South American market (Newfoundland).

drum gravity trap = gravity trap (a weighted cylinder that falls down and traps any fish pulling on a bait attached to a trigger mechanism).

drum muscle = one of the muscles attached to the gas bladder which makes the contained gas vibrate and emit a drumming sound. In pimelodid catfishes, for example, a muscle originates on the parapophyses of the 4 vertebra and sometimes too from the neurocranium and inserts on the ventro- and ventro-lateral surfaces of the gas bladder. Fish with drumming muscles also have a tensor tripodis, *q.v.*, to reduce sound conduction to the inner ear See also drum, elastic spring mechanism and protractor post-temporalis mechanism.

drumming muscle = drum muscle.

drum seining = purse seining with shallow nets stored on, and paid out from, a powered drum at the stern of the vessel.

drum trap = a small fish trap in the shape of a cylindrical drum with entrance funnels, about 30 cm in diameter, made of local materials such as bamboo.

drum trawling = a trawl is paid out from a powered drum at the vessel stern.

drunk = it is illegal to get a fish drunk in Ohio according to state law.

drunk as a fish = very drunk.

drusel = to sprinkle salt on fish to keep them fresh while they are being gutted (Shetland Isles dialect).

dry = 1) the exposure of a split and gutted cod to sun and wind as part of a curing process. The process reduces natural moisture content.

dry = 2) try (to drain fish livers for oil).

dry bulk = dried and salted cod stacked in layers.

dry bundh = a shallow, seasonal depression bounded on three sides by embankments which captures monsoonal rain water.

dry caviar = caviar prepared in such a way that the eggs can be separated easily.

dry cure = to preserve cod by light applications of salt and through exposure to sun and wind.

dry curing = curing of fish by adding salt crystals.

dry deposition = a form of acid deposition (the addition of acidic material to the ground or water, usually from sulphur and nitrogen compounds emitted by factories and deposited far from this source, resulting from particle fallout or acidic gases. Wet deposition is also called acid rain, *q.v.*, and is the result of rain, snow or fog).

dry fish = cod preserved by exposure to sun and wind after application of salt.

dry fly = a lure imitating an insect that floats on the water surface.

dry fly floatant = a chemical in aerosol, liquid or paste form applied to a dry fly to waterproof it.

dry off = to dry salted fish by exposure to the sun.

dry pile = split and salted cod placed in a stack towards the end of the curing process.

dry rack = any structure for suspending fish fillets for drying and curing.

dry ration = air dried food made into particles suitable for feeding fish.

dry salted fish = fish cured by stacking split fish between layers of salt so that they drain freely. Used particularly with non-fatty fishes.

dry salting = salting (flavouring fish by rubbing in salt or by immersing the fish in brine for a short time before further processing such as smoking or canning. Also called salting or brining).

drying = the removal of moisture from fish by evaporation as a means of preservation; see dried fish. May be natural, taking place in the open air or over wood fires, or technological involving vacuum or freeze drying, for example. Often used in combination with salting and smoking.

drying beach = that part of a beach uncovered by water. Also called subaerial beach.

drying flake = an outdoor platform or rack for drying fish, *q.v.*

drying stage = a shed near the shore or built out over the water for landing, cleaning, salting and storing fish.

drying twine = drawing twine.

drying up area = drawing twine.

DS = abbreviation for dissolved solids (very small pieces of organic and inorganic material contained in water. Excessive amounts make water less habitable for fish, unfit to drink or limit its use in industrial processes).

DSL = abbreviation for deep scattering layer.

dual fin otter board = an otter board developed in British Columbia for midwater trawling using plywood sections to spread the trawl mouth.

dual purpose trawl = a trawl designed to fish on, and just off, the bottom.

dual purpose vessel = a vessel equipped to fish with two types of gear, e.g. seine and drift nets.

dubbing = fly tying material (strands of fur, plastic fibres, wool) wrapped onto a thread using wax and wrapped around the shank of a hook to imitate the abdomen and/or thorax of a fly.

dubbing rake = a tool used to tease out dubbing to give it an enlarged appearance.

dubiotype = incognitotype (an unofficial term in nomenclature for a type whose labels have been lost).

dubious name = a name having uncertain application because it is impossible to establish the taxon to which it should be referred (*nomen dubium*).

Dubisch method = the design and construction of a Dubisch pond, named for its inventor.

Dubisch pond = a pond specially designed for spawning carp, which favour vegetation for egg deposition. Grass is grown to a height of about 40 cm on the pond bottom before water is added to the tip of the grass, and the spawning fish are introduced. A deep trench around the pond is where parental fish are kept.

Duchess Ann = a trout, named after the 17th century Ann, Duchess of Hamilton, who imported it from England to the Clyde River in Scotland. It is silvery, with bright scarlet spots and grows to a large size.

duckbilled = a descriptive term for a snout that is shaped like a duck's bill, flattened and often concave in the upper outline, e.g. in the gobiid *Anatirostrum profundorum* or the pike *Esox lucius*.

ducotype = a joke name in nomenclature for a type with head of one species affixed to the body of another. Also called gluotype.

duct = any tube-like structure.

duct of Cuvier = the common cardinal vein. The anterior cardinal vein returns blood from the head and the posterior cardinal vein from the trunk, joining together as the common cardinal vein (also called incorrectly the vitelline vein). The jugular vein from the lower jaw also empties into the common cardinal vein. The two common cardinal veins empty into the sinus venosus, *q.v.*

ductus communis = the tube into which several gill pouches open and which communicates with the exterior, e.g. in Myxinidae.

ductus Cuvieri = duct of Cuvier.

ductus endolymphaticus = a tube (endolymphatic duct) from the utriculus in the inner ear opening on the dorsal surface of the head in Elasmobranchii and terminating in the endolymphatic sinus in Teleostomi.

ductus pneumaticus = a tube connecting the pharynx to the gas bladder; pneumatic duct.

ductus semicirculares = semicircular ear canal (fluid-filled canals embedded in the cranium and concerned with balance and hearing. Gnathostomata have 3 canals, lampreys have 2 (lacking a horizontal canal) and hagfishes have only one canal).

duffy = a cod with a rounded or blunt head See also bulldog cod.

Duke's fish = a taboo name for salmon, as these were the property of the landowner, the Duke of Argyll (Scotland).

dull as a fish = very dull or uninteresting; not a condition subscribed to by ichthyologists.

dum(b) fish = dun fish (3).

dumb line = one of the ropes used to raise the cod trap door before the trap is hauled to the surface.

dumb string = end rope (a line connecting the end of the first or last section of a longline backrope or string to the dan line (all *q.v.*). Also called back of line, longline, dummy, end tow, lud tow and spreadline).

dumber than goldfish = dolphins; much of the large dolphin (and whale) brain is for insulation in cold water (Globe and Mail, 17 August 2006).

dummy = 1) the towpost amidships to which the warp is attached by a stopper when towing the trawl.

dummy = 2) end rope (a line connecting the end of the first or last section of a longline backrope or string to the dan line (all *q.v.*). Also called back of line, dumb string, longline, end tow, lud tow and spreadline.

dummy rock = a pierced rock attached to a longline to keep it down when fished from a dory (Canada).

dummy run = a partial migration of immature fish to spawning grounds, e.g. in some cod populations.

dumping = deliberate disposal of a catch that normally would be landed for sale. Fish are dumped because of quota closures, market saturation and high-grading, *q.v.*

dumpling = fish ball (fish don't have balls but are sometimes made into them. A ball of shredded white fish or cod and mashed potatoes, flour or other binding material, usually fried. Also called fish dumpling. See also catfish ball and ball).

dun = 1) an aquatic insect that has just emerged from the water and can fly.

dun = 2) a greyish or grey-blue colour in the wings of mayfly adults. Both terms are used in fly fishing as characters to imitate in making artificial flies.

dun = 3) a measure of the presence of the mold *Sporendonema* in commercial preparations of fish. Ranges from slight (barely visible) to moderate (less than 25% of the surface area).

dun = 4) a cure by slack salting (*q.v.*) of cod caught early in the spring, and often in February. Fish are laid in a pile for two or three months, in a dark store, covered, for the greatest part of the time, with salt hay or eel-grass, and pressed with some weight. In April or May they are opened and piled as close as possible in the same dark store, till July or August, when they are fit for use (New England).

dun fish = 1) cod with a brown discolouration caused by fungal growth (usually *Sporendonema*) on dried fish kept in damp conditions, poorly dried or stored.

dun fish = 2) fish prepared by the dun method (see dun (4)).

dun fly = an artificial fly used in angling.

duncan = a half-grown cod (Scottish dialect).

Duncan loop = in fly fishing, a knot used to attach a fly to the leader, leave the fly swinging freely or, if tightened, snug against the knot. Various websites have animated steps showing how to tie this knot. Also called a uni knot.

dundie = doondie.

dung worm = a worm or larva found in cow dung and used as bait for catching fish.

dunnage = dinnage.

dunning = dun (4).

duodenal vein = one of several veins draining capillaries of the duodenum adjacent to the gall bladder to the hepatic portal vein.

duodenum = an s-shaped loop of the intestine from the end of the stomach. The intestine continues as a straight section to the anus.

duplotype = 1) an unofficial term in nomenclature for a second holotype for the same taxon.

duplotype = 2) an unofficial term in nomenclature for a single specimen used as the holotype for two different taxa. The later described one is a redundotype.

duration of ebb = the interval in which a tidal current is ebbing, determined from the middle of slack waters.

duration of fall =the interval from high to low water.

duration of flood = the interval in which a tidal current is flooding, determined from the middle of slack waters.

durken = said of fish that stop biting or are disinclined to bite (Scottish dialect).

durophagus = eating hard food such as mollusks, e.g. Chimaeridae.

Dutch aquarium = an aquarium where the plant species are of equal or greater importance than the fish. The plants may be arranged artistically and are the main aesthetic feature.

Dutch cured herring = herring gibbed (gills and intestine removed) and salted at sea and repacked ashore; not limited to the Dutch.

Dutch mess = salt cod and potatoes with browned onions. Garnished with scrunchions (the crunchy bits remaining after pork fat is rendered). Also called house bankin', fish and scrunchions or hugger-in-buff.

DWT = dressed or dressing weight, the weight of a dressed fish.

dyeing = 1) addition of an artificial or natural dye to fish before marketing, e.g. annatto, a yellow vegetable dye used to color fish before smoking, and amaranth a red dye used in fish roe.

dyeing = 2) addition of an artificial or natural dye to aquarium fish as a marketing ploy. Fluorescent dyes have been injected into glassfishes (Chandidae) and sold as "painted angels" or "disco fish". The painted areas fade and the fish are susceptible to skin lesions and kidney and liver damage, and have a shorter life span than normal specimens.

dyestuff = an indigestible pigment added to feed in aquaculture in order to monitor consumption of that feed through examination of stomach or faecal content.

dyke = dike.

dylox = O,O-dimethyl-2,2,2-trichloro-1-hydroxy-ethyl phosphonate, an insecticide used in control of parasitic copepods. Also called dipterex and masoten.

dynamic lift = angling of the pectoral fins to create lift, as seen in sharks, which helps maintain position in the water. Requires that the fish keeps swimming.

dynamic pool model = analytical yield-per-recruit types of fisheries models describing how growth, recruitment and mortality interact, resulting in biomass and yields.

dynamite fishing = the use of explosives to kill and stun fish for capture. Used on coral reefs where nets cannot be operated without becoming tangled or ripped. Obviously illegal almost everywhere. Has been used by ichthyologists as a sampling method. Also called blast fishing.

dynnage = dinnage.

dyphyochir = formation of the pectoral fins in two stages in Soleidae. The first, larval fins degenerate and post-larval fins are formed anew (from the French).

dys- (prefix) = abnormal, bad, insufficient, malfunction, difficult. Opposite of eu-.

dysphotic zone =the area in a water body without enough light for photosynthesis but enough for behavioural responses by the organisms living there (about 80-200+ metres). Also spelled disphotic.

dysspondylous = referring to vertebrae in *Amia*, Lepisosteidae and Acipenseridae where the pleurocentrum, intercentrum, basidorsal, basiventral, interdorsal and interventral all ossify but remain independent in the embryonic and juvenile stages. Some elements fuse later and form vertebrae with two centra in the caudal region and typical vertebrae anteriorly.

dysspondyly = the condition of a dysspondylous vertebra.

dystrophic = 1) a type of lake in cold climates with low productivity, limited photosynthesis, scarce phytoplankton, carbon dioxide high and with hypolimnion oxygen depleted. Calcium, phosphorous and nitrogen scanty. Basin deep to shallow, found in boggy areas or mountains, with yellow to brown color and fairly abundant littoral vegetation. Generally transforms into a peat bog as organic materials accumulate because of only partial decomposition. Also used to refer to species inhabiting such lakes.

dystrophic = 2) pertaining to caves mostly supplied with vegetal matter during floods.

dystrophy = the dystrophic condition.

dz = doppel zentner (100 kg).

## E

E = abbreviation for exploitation rate (the proportion of a population at the beginning of a given time period that is caught during that time period (usually on a yearly basis). Also the ratio of fish caught to total mortality (= F/Z when fishing and natural mortality take place concurrently (Ricker, 1975)). Also called rate of exploitation).

e-mail fish = <><

e.g. = abbreviation for *exemplia gratia*, meaning for example.

e.p. = abbreviation for *ex parte*, meaning in part, partly.

e-type = a digital image of a holotype (Gewin, 2002).

EA = abbreviation for enterprise allocation, *q.v.*

Ea = a Sumerian fish god living in a submarine palace. Usually depicted as a man covered with a fish skin. Ea brought culture to mankind from the sea. See also apkallu fish and Enki.

eagle claw hook = a hook with the point curved inward in line with the eye; some varieties are double offset to the left and right.

eagre = bore (a rapid tidal rise in a river that forms an advancing wall of water).

ear = inner ear (the auditory organ lying in the otic capsule, consisting of the semicircular canals, ampullae, utriculus, saccus, lagena, sinus endolymphaticus and ductus endolymphaticus. Filled with and surrounded by perilymph (or seawater in forms with an endolymphatic duct), containing otoliths (sagitta, astericus and lapillus in teleostomes). Functions as a gravity receptor, acceleration detector and muscle tone regulator. Innervated by cranial nerve VIII).

ear bone = earbone.

ear flap = a flattened, flexible structure extending back from the rear edge of the gill cover (operculum), e.g. in Centrarchidae. May be composed of skin or be supported by an extension of the operculum.

ear sac = branchial sac or gill pouch (the sac containing the gills and communicating with the mouth cavity and with the exterior in Myxini and Petromyzontiformes). Probably meant to be any pouch or sac surrounding the gills in fishes generally.

ear tab = ear flap.

earbone = used for earstone, incorrectly as it is not a bone.

earlier synonym = older synonym (an earlier synonym that cannot be used as the name for the taxon under the provisions of the International Code of Zoological Nomenclature).

early life history = the stages from egg to juvenile in development.

early mortality syndrome = large scale mortalities of introduced salmons in the Great Lakes just before yolk sac absorption. May be due to a vitamin deficiency.

earstone = otolith (a free calcium carbonate body in the inner ear used for perception of acceleration including gravity. The lapillus lies in the utricle, the sagitta in the saccule, and the asteriscus in the lagena. Also called statoliths or ear stones).

earth pond = earthern pond.

earheater = taking mouthfuls of substrate with included food items and ejecting the debris, e.g. geophagine Cichlidae.

earthern pond = an aquaculture pond made by excavation or by constructing dykes, usually 10 times longer than wide, with a bottom that may require sealing or lining to prevent water loss. Also called Danish pond.

earthy flavour = a tainted flavour or odour of fish flesh caused by the chemicals geosmin and 2-methylisoborneal released by microorganisms in the water and taken up by fish through their gills. These chemicals have very low detection thresholds, about 1 nanog/l. Found in fresh and brackish water fish as the responsible Cyanobacteria (*Anabaena* (geosmin) and *Oscillatoria* (2-methylisoborneal)) do not grow in sea water. Also called muddy flavour.

Eastern Garbage patch = Great Pacific Garbage Patch (a gyre in the central North Pacific Ocean between about 35-42°N and 135-155°W, having large amounts of plastic and other garbage trapped by the currents of the North Pacific Gyre. The size of the patch has been estimated at 700,000 km<sup>2</sup> to 15 million km<sup>2</sup> with perhaps over 100 million tons of debris. A major source of pollution and of plastics ingested by marine organisms as it resembles zooplankton. May form a habitat for fishes in the featureless open ocean. Also known as the Pacific Trash Vortex.

eastern shore boat = a smaller version of the Tamcook boat (*q.v.*) about 28-32 feet long with a crew of two. Used in Nova Scotia.

eat the rocks = said of cod schooling in large numbers near rocky shores in pursuit of capelin (Newfoundland).

eating fish = salt cod kept for home consumption (Newfoundland).

eating tourism = vacations for the purpose of sampling local foods, e.g. Chinese tourists travelling to areas where popular live reef fish are less expensive such as Kota Kinabalu, Malaysia, resulting in a decline in these fish populations.

eats no fish = a trustworthy man; an honest man; not a papist (Protestants in the reign of Queen Elizabeth I refused to eat fish on Fridays to show they were not Catholic).

ebb = 1) a falling or receding tide, a tide between a high water and the succeeding low water. Flow exits an estuary during ebb tide.

ebb = 2) a part of the shore between high and low water marks assigned to individual fishermen (Scottish dialect).

ebb current = the movement of a tidal current away from shore or down a tidal stream.

ebb interval = the interval between the transit of the moon over the meridian of a place and the time of the following strength of ebb.

ebb stel = a fishery involving a stel carried out on an ebb tide.

ebb strength = the ebb current at the time of maximum velocity.

ebb tidal delta = the sand bar formed at the seaward mouth of tidal inlets as a result of the meeting of tidal currents and waves.

ebb tide = ebb. Strictly, a non-technical term.

Ebisu = one of the seven Japanese Gods of Happiness, the protector of fishermen, symbolised by an angling rod and a large fish held in his hand.

ec- (prefix) = out, outside.

eccentric = 1) off centre, deviating from the usual.

eccentric = 2) said of dictionary compilers.

ecdemic = not native; opposite of endemic.

echelon trawl = an experimental form of otter trawl with a large upper wing and paravanes instead of doors. Meant for use in bottom fishing and midwater herring fishing.

echo signature = a unique sonar return or reflection that can be used to identify individual species of fish.

echo sounder = a sonar device that sends a signal to the bottom of a body of water and back. Used to detect fish schools and to map the bottom as an image is displayed on a screen. Used in angling, it is also called a fish finder.

eclosion = the process of hatching from an egg.

eco-label = a label placed on commercial products to indicate that environmentally friendly methods have been used in its capture and preparation.

eco-port = a port that allows ships to discharge waste in an ecologically sustainable manner.

ecocline = gradual and continuous change in environmental conditions of an ecosystem or community.

ecodeme = a population occurring in a specified kind of habitat.

ecological drainage unit = a drainage that differs from adjacent ones in fauna and physiography.

ecological extinction = a fish population where numbers are too few to maintain their role ecologically.

ecological niche = the place of an organism in its biotic environment; the position or function of an organism in a community of plants or animals; anthropomorphically speaking, its occupation. A microhabitat.

ecological resilience = the ability of an ecosystem to absorb change. See also resilience.

ecological reserve = an area zoned to protect the living resources through prevention and prohibition of fishing and the disturbance of the living and non-living resources.

ecology = the science of the role played by the environment in the life of an organism; the interrelationships between organisms and their environment. It deals with the role of the environment in determining what organisms will be present.

ecomorph = a local population or group whose appearance is determined by ecology, e.g. lake ecomorphs are deeper bodied than river ecomorphs. Not of systematic or taxonomic significance.

economic discard = a fish thrown overboard in a commercial fishery for economic reasons, e.g. too small, damaged, not enough commercially value, etc.

economic efficiency = the point at which the added cost of producing a unit of fish is equal to what buyers pay. Producing fewer fish would bring the cost lower than buyers are paying. Producing more fish would raise the cost higher than buyers are paying. Harvesting at the point of economic efficiency produces the maximum economic yield. A measure of the efficiency of input producing output.

economic overfishing = occurs when a fishery is generating no economic rent (higher than economic efficiency), primarily because an excessive level of fishing effort is applied in the fishery. Does not always imply biological overfishing.

economic production = the catching of a great quantity of fish of as high a commercial value as possible.

economic rent = the total amount of profit that could be earned from a fishery owned by an individual. Individual ownership maximizes profit, but an open entry policy usually results in so many fishermen that profit higher than opportunity cost is zero.

economic zone = exclusive economic zone, *q.v.*

economically healthy fishery = a fishery that supports the fishers, their gear and the improvement of gear and techniques.

ecophenotype = a phenotype showing adaptations associated with the habitat or environment that are not genetic.

ecospecies = a group of related ecotypes that exchange genes without loss of fertility; roughly the same as a taxonomic species.

ecosystem = the complex of living organisms and environmental conditions that function as a unit. Biocenosis plus biotope.

ecosystem overfishing = occurs when the species composition and dominance is significantly modified by fishing, e.g. with reductions of large, long-lived, demersal predators and increases of small, short-lived species at lower trophic levels.

ecotone = the boundary or transition area between two or more habitats or communities.

ecotope = the abiotic or non-living part of an ecosystem.

ecotype = a population adapted to a restricted habitat as a result of natural selection within a local environment. Nothing to do with taxonomy.

ectad = outwards, towards the exterior.

ectethmoid = parethmoid (a paired deep bone lying in the front of the orbit under the prefrontal).

ecto- (prefix) = outside, outer, external.

ectocommensal = a commensal that lives on the surface of the host.

ectocoracoid = a paired dermal bone in Gasterosteiformes connected with the coracoid and extending posteriorly. Has also been applied to the element below the scapula and applied to the coracoid in Dipnoi.

ectogenic meromixis = the mixing of lake water as a result of some outside agency, e.g. influx of saline water.

-ectomy = surgical removal, e.g. ovariotomy, removal of the ovaries.

ectoparasite = an external parasite, on fishes often lice or leeches. Also includes parasites found in the gill cavity.

ectopterygoid = a paired, deep, dermal bone forming part of the roof of the mouth, articulating anteriorly with the palatine, posteriorly with the quadrate and mesially with the endopterygoid if the latter is present. In *Amia* it has one or two rows of teeth. Sometimes called pterygoid when there is no endopterygoid.

ectotherm = an organism with a body temperature determined by the environment; poikilotherm; cold-blooded.

eddy = a circular movement of water where currents flow counter to each other or pass obstructions.

edema = a swelling; abnormal accumulation of serous fluid in the interfibrillar spaces of connective tissue. Also spelled oedema.

edentate = toothless.

edentulate = toothless.

edentulous = toothless.

edge = a term for a change in the structure, conditions or vegetation in a lake or other water body. Edges can be weed lines, drop-offs, temperature areas, water clarity, current, etc. Fish are often found at such edges, actively feeding.

edge type = a deposition found on the outer edge of a scale, otolith or other ageing structure representing the most recent growth.

edible fish = fish than can be eaten; suitable as food, usually in the commercial sense.

edible weight = the weight of a fish after removal of bones, guts, etc.

edition = all the copies of a publication printed at the same time (but not an unaltered reprint). A later edition is a separate and later printing with or without changes in the text.

education collection = a group of museum specimens for use in an educational programme. These may have fewer restrictions on handling than most museum specimens, may not be catalogued in the permanent collection of the museum and may be discarded when damaged or no longer required.

eel = 1) a general term for any fish with an elongate body. Strictly, a member of the Order Anguilliformes with over 790 species world-wide, mostly in shallow marine waters. Most terms mentioning eels in English are referring to *Anguilla anguilla*, the European eel, and sometimes to *Anguilla rostrata*, the American eel. Lamprey-eel is a misnomer as lampreys are not eels. Lampreys (Petromyzontidae) are sometimes referred to as eel-shaped but eels could more correctly be termed lamprey-shaped on an evolutionary basis.

eel = 2) to fish for eels.

eel = 3) to move sinuously like an eel.

eel = 4) a Japanese flavour of ice cream, made with many others in response to a hot summer in 2004. See also saury and brandy, and shark fin and noodle.

eel = 5) nickname for a New Englander.

eel ark = a device or trap for catching eels (Scottish dialect).

eel ascending ramp = part of an eel ladder, this ramp has structures against which the eels can push to ascend. The ramp may be simply a hollowed out tree filled with old fish nets or a commercial product made of plastic with an undulating surface and studs.

eel basket = a basket trap, *q.v.*, for catching eels.

eel bed = 1) a pond for eels.

eel bed = 2) a swampy bivouac.

eel blobbing = catching eels with eel spears.

eel bob = a special bait, or bob made to catch eels by bobbing, *q.v.*

eel buck = a large basket used to catch eels. Also called buck.

eel comb = eel rake.

eel drowner = a clever person as they can perform the impossible; used ironically and negatively (Scottish dialect).

eel fare = 1) the passage of young eels upstream.

eel fare = 2) a brood of eels.

eel Florentine = a dish made of skinned and headed eels, cut into pieces, sprinkled with salt, pepper and olive oil, refrigerated for two hours, then coated with bread crumbs, oil is heated in a casserole, garlic is sauteed, sage and eel pieces are added in a single layer, and baked at 350°F for 40 minutes.

eel fork = an Asian hooked device with one or two sharp prongs thrust into mud to catch eels, the fisherman being on foot or operating from a boat.

eel fyke net = a fyke net (*q.v.*) designed to catch eels (*Anguilla* spp.).

eel graip = a small fork used for digging up or spearing sandeels (Scottish dialect).

eel grate = 1) a kinnd of trap placed in a mill race to catch eels (English dialect).

eel grate = 2) catching eels with a spiked pole or stang.

eel hook = eel fork.

eel killing = eel pulling.

eel knife = a knife specialised for splitting an eel lengthwise.

eel ladder = a fish ladder designed to help eels over dams and weirs. A substrate is provided for the eels to push against when slithering upstream. A fish elevator may be part of the process at high dams. See also eel ascending ramp.

eel leap = a wickerwork eel trap.

eel line = a long line with up to a thousand baited hooks used to catch eels.

eel muggie = a fish stomach used as a container for eel fat (Scottish dialect).

eel pick = a form of spear used for catching eels.

eel pie = a pastry pie containing eels. The eels have their head, tail and skin removed, are sliced into segments and placed in the bottom of a pie dish with chopped onion and parsley and seasoned with salt, pepper and nutmeg. A stock may be made by soaking the skinned eels in water with the heads and tails. Eel sauce is then made with melted butter, flour and eel stock, thickened and lemon juice added, before pouring into the pie and serving hot.

eel pit = a hole or depression where eels hide or congregate.

eel pot = a trap to catch eels, usually a basket trap.

eel pulling = a sport in Amsterdam in the nineteenth century. A live eel was suspended from a rope over a canal and people below in boats would try to grab it. The sport was made illegal resulting in the Eel Riot (*q.v.*).

eel putchon = a baited eel basket, used in spring and summer.

eel rake = a comb or rake-like implement used in eel fishing. Also called eel comb.

eel rhabdovirus = viruses isolated from European and American eels, relationship to each other or to other rhabdoviruses unknown.

Eel Riot = occurred on 25 July 1886 in Amsterdam when the sport of eel pulling (*q.v.*) was made illegal. About two dozen people died with gunshot wounds from the police and about 80 wounded.

eel schuit = an eel boat.

eel set = nets set across a stream to capture eels.

eel shot = the first fish caught and gutted on New Year's Day (Scottish dialect).

eel skin = 1) the skin of an eel. See also eelskin, eelskins.

eel skin = 2) a tight-fitting dress or other garment. See also eelskin, eelskins.

eel spear = a pronged device for spearing eels.

eel tow = a line laid inshore for catching eels for bait (Scottish dialect).

eel tongs = ridged metal tongs with long wooden handles used to pick up slimy, slippery and muscular eels.

eel trap = a trap for eels having a flap at the entrance allowing entry but not exit.

eel treading = detecting eels lying dormant in mud by treading on them, or stirring up mud in a swamp to suffocate and thereby capture eels.

eel trunk = a box with holes in the side wherein eels are kept alive until readied for eating.

eel tuft = a small bundle of brushwood, several of which may be tied along a line. They are about 1 metre in length and resemble brooms; fish hide in these structures and can be caught when they are rapidly pulled from the water or scooped with a net. Used to catch eels, burbot and possibly lampreys in Europe.

eel virus = an orthomyxovirus-like organism isolated from European eels with stomatopapilloma although relation to latter unknown.

eel weel = eel buck.

eel wheel = eel buck.

eel-backed = horses having black stripes along their backs.

eel-leap = a wickerwork eel trap.

eel-like = similar to an eel, usually meaning eel-shaped.

eel-putchon = a baited eel basket, used in spring and summer.

eel-set = nets set across a stream to capture eels.

eel-shaped = elongate body form as in eels, e.g. Anguillidae. Lampreys (Petromyzontidae) are often referred to in this fashion although eels should be called lamprey-shaped.

eel-trunk = a box with holes in the side wherein eels are kept alive until readied for eating.

eeleator = a young eel (archaic).

eeler = a fisher for eels.

eelery = an area devoted to the raising of eels.

eelgrass = a submerged aquatic plant (*Zostera marina*) of the North American Atlantic coast with very long and narrow leaves.

eelgrass meadow = an extensive bed of eelgrass, an important marine habitat for fish, but ca. 90% has been destroyed along the North American coast.

eelhood = the rank or condition of being a full-grown eel.

eeling = catching or fishing for eels.

Eels = 1) a nickname for New Englanders in the 1830s, a tribute to their fondness for eels.

Eels = 2) an American rock band formed by singer and songwriter Mark Oliver Everett.

eelskin = a fine leather made from the skin of hagfishes (Myxinidae). See also eel skin.

eelskin wallet = wallets made of electric eel skins were said to demagnetise credit cards, a popular myth. The wallets were made from hagfish skin. Magnetic metal clasps may have played a part.

eelskins = tight trousers (slang). See also eel skin.

eely = eel-like, wriggly.

EEZ = exclusive economic zone, *q.v.*

effective concentration = the concentration of a substance in water needed to produce a specific effect to a portion of test animals, e.g. EC<sub>50</sub> is the concentration producing an effect in 50% of the test fish.

effective fishing effort = fishing effort, e.g. hooks per day, adjusted or standardised, when necessary, so that each increase in the adjusted unit causes a proportional increase in

instantaneous rate of fishing. Controls purported to limit effective effort imply that the fishing mortality rate is to be limited. Abbreviated as  $F/q$ ,  $F/q$ ,  $f$  or  $f$ .

effective publication = publication in accordance with the requirements of the International Code of Zoological Nomenclature.

effective rainfall = the portion of total rainfall that reaches rivers and lakes.

effectiveness of fishing = the percentage removal of fish from a stock, but not specifically defined as either rate of exploitation or instantaneous rate of fishing.

efferent = leading away from.

efferent branchial arteries = those arteries paralleling the afferent branchial arches (*q.v.*) and joining to form a left and right root or radices of the dorsal aorta.

effluent = 1) that which flows out or forth, especially a stream flowing out of a body of water.

effluent = 2) wastewater such as that from a fish farm, municipal sewage plants, pollutants, and coolant waters from a nuclear power plant.

effluent stream = gaining stream (a stream or a part of a stream where flow increases because of groundwater discharge).

efflux = flowing out, that which flows out.

effort = 1) the total fishing gear in use for a specified period of time; when two or more kinds of gear are used, they must be adjusted to some standard type before being added.

effort = 2) effective fishing effort, abbreviated as  $f$  or  $f$  (Ricker, 1975).

effort = 3) the amount of time and fishing power used to harvest fish. Fishing power includes gear size, boat size, and horsepower. May be expressed as days away from port, hours trawling, length of drift net, etc.

effort = 4) a measure of resource use by anglers, e.g. number of angler hours, party hours, boat hours, trips on the water. Also called fishing pressure.

effort control = 1) a measure applied to effort used by managers to regulate fishing.

effort control = 2) limitations on gear and time used rather than on catch limits as a means of managing a stock.

effort restriction = a type of input control used as a management tool whereby the amount of fishing effort expended by fishers in a particular fishery is restricted by law or voluntary agreement among fishers who jointly exploited fishery resource. In practice, as fishing effort is a composite index of various elements, e.g. fishing craft, gear and ancillary equipment, fishing time, etc., it has proven to be difficult to effectively contain its growth in the medium and long term.

EFL = eye-fork length, q.v.

EFZ = exclusive fishing zone, q.v.

egesta = food or waste products eliminated from an organism, including bacteria and mucus.

egestion = the production of egesta.

egg = 1) a fish egg, varying in size from under 1.0 mm to 6.0 mm or more, and of various colours.

egg = 2) a simple type of fly tied in imitation of a fish egg from yarn, usually orange or pink, and fished along the bottom.

egg case = the keratinous egg shell of Myxini, Elasmobranchii and Holocephali containing the developing embryo.

egg crate = a plastic grid that allows free flow of water in aquaria. Used for dividing an aquarium into separate areas or to allow eggs to fall through and be protected against predation.

egg dummy = an egg-like spot, e.g. on the anal fin of mouthbrooding Cichlidae. The male cichlid displays these spots to a female who sucks at the spots assuming them to be real eggs; the male releases sperm that fertilise the eggs in the mouth of the female. Also called egg spots or false eggs.

egg layer = the usual mode of reproduction in fishes where eggs are laid outside the body and fertilised there by the male.

egg lobe = egg ribbon.

egg loop = a special knot used to attach a leader to a hook, specifically designed to hold roe bait.

egg mass = eggs that have been laid in a large amount or clump.

egg pincette = small tweezers or tongs with cup-shaped tips, used to pick out defective eggs in hatcheries trays.

egg pit = the pit in a redd where the female deposits one batch of eggs.

egg pouch = egg sac.

egg production method = a means to estimate spawning biomass of fish by a probe attached to a plankton net. The probe measures temperature and depth at which the eggs were collected and thus allows extrapolation to the total spawning biomass in the area under study.

egg raft = a supporting structure of various shapes and dimensions which carries eggs, e.g. in *Histrio* and *Antennarius*.

egg ribbon = long, ribbon-like (2 m by 8 cm) egg masses, some with a central cavity, found in certain fish species, e.g. *Perca flavescens*.

egg sac = the envelope enclosing the ova of a fish.

egg scooper = a small scoop or tray with a vertical handle, allowing transfer of eggs in hatcheries, e.g. to incubator trays.

egg shell = chorion (an embryonic membrane, elaborated by the follicle cells, which encloses the egg. The eggs of truly viviparous fishes are non-chorionated. Usually hardens on contact with the water; after fertilization the egg secretes fluid and shrinks inward leaving a perivitelline space. May lie external to the zona radiata. Called egg shell in fish).

egg sinker = a type of weight used in angling and shaped like an egg with a hole through the middle. Used in still water and for rolling in current.

egg size = the greatest diameter of a spherical egg, both the length and width of elongate or elliptical eggs.

egg sorter = a worker in a processing plant packing Pacific salmon eggs for export.

egg spot = egg dummy.

egg stealer = a fish that feeds on the eggs of other fishes by stealing them from a nest site, e.g. the Lake Malawi cichlid *Otopharynx ovatus*.

egg string = egg-strand.

egg survey = the abundance of eggs and larvae in an area, determined by sampling with appropriate gear, e.g. small meshed midwater trawls, plankton nets, bamboo traps. Used to estimate the size of the spawning stock and/or the importance of spawning.

egg take = the number of eggs taken at hatcheries when adult fish are spawned.

egg viability = the ability of an egg to develop normally.

egg weight = egg-shaped lead weights with a hole through their middle used in angling. The line runs freely through the hole and when a fish takes up the bait and runs, it feels little resistance.

egg yolk = the yellow part of an egg containing proteins to nourish the embryo and larva.

egg-bearing season = that period of a year when a female fish is carrying eggs.

egg-capsule = egg-case.

egg-carrying = attachment of eggs to a fish for incubation, e.g. in *Kurtus gulliveri* (Kurtidae) where egg masses are attached to the male supraoccipital hook.

egg-case = the keratinous egg shell of Myxini, Elasmobranchii and Holocephali containing the developing embryo.

egg-laying = the process of depositing eggs.

egg-laying area = that part of the bottom or other structures where eggs are deposited.

egg-strand = the elongate, hollow, cylindrical structure produced by *Perca fluviatilis* and *P. flavescens* containing eggs which is twisted around plants and logs.

egg-to-smolt survival = the numerical difference between the number of fertilized eggs produced by a groups of fish and the number of smolts resulting from those eggs.

eggs-per-recruit = an index of abundance, the average number of eggs produced by a fish that has been recruited (moved into a spawning or fishing-size class).

Egtved disease = an acute or chronic disease of salmonids, such as rainbow trout in farm ponds, causing loss of appetite and of schooling behaviour, darkened colour, bleeding, hyaline gills and exophthalmia. It is associated with temperature changes and with the late winter and spring seasons when temperatures are below 8°C. Abbreviated as VHS. Also called viral haemorrhagic septicaemia and trout pest.

eicosapentaenoic acid = an omega-3-fatty acid, q.v., found in fish oil; its chemical name is *all-cis*-5,8,11,14,17-eicosapentaenoic acid. Said to reduce the risk of heart attacks in humans when ingested at 1800 mg per day. Also called icosapentaenoic acid and timnodonic acid. Abbreviated as EPA.

eight-angle net = two boat lift net (a large coastal Japanese lift net, with or without wings, operated from two boats and set against the current. May be operated in the day but at night, additional boats with lights are used to attract fish).

eight boat lift net = a coastal Japanese lift net about 200 m in circumference laid on the sea floor by eight boats in an area where fish are expected to pass over it. When a spotter determines fish are over the net it is lifted so that fish are driven to one corner. Used to catch mackerel and sardines. See also two boat, three boat and four boat lift nets.

einstein = a gene name for a zebrafish mutation affecting the ear (one otolith at all stages). See also half stoned, what's up, rolling stones, van gogh, among many others.

EIS = abbreviation for Environmental Impact Statement.

Ekman circulation = movement of surface water at an angle from the wind as a result of the Coriolis effect.

Ekman layer = the thin horizontal layer of water riding on top of the ocean that is affected by wind.

El Niño = abnormally warm ocean climate conditions, which in some years affect the Eastern coast of Latin America (centred on Peru) often around Christmas time. The anomaly is

accompanied by dramatic changes in species abundance and distribution, higher local rainfall and flooding, massive deaths of fish and their predators including birds.

elaborate = highly developed, unusual, specialised, said of structures or colours of fishes.

élangueur = a piece of wood used to keep the mouth of fish open while the hook is removed in longlining for cod (Canada).

elasmobranch poisoning = poisoning resulting from eating the flesh or viscera of sharks and rays. Poisoning from shark flesh is generally mild while that from shark liver may result in severe effects such as nausea, vomiting, diarrhoea, abdominal pain, headache and prostration, leading to coma and even death. Treatment is symptomatic, no antidote is known.

elasmoid scales = cycloid and ctenoid scales, *q.v.*

elastic = a mechanism used inside fishing rods in Europe. An elastic is threaded into the top three sections of a rod, anchored inside, fed out through a protective bush at the rod tip, and the line tied to the end. Elastic is pulled out by a hooked fish but cushions any run by the fish, helping in fighting and landing the fish. The elastic retracts into the rod when the fish stops running or is unhooked. Elastics come in various strengths from 1 (smallest) to 20 (largest), the diameter increasing with size. PTFE bushes are used internally or at the point the elastic emerges from the rod tip. These polytetrafluoroethylene bushes have a very low friction level and protect the elastic from wear.

elastic cartilage = cartilage containing elastin fibres as well as collagen and having a yellowish appearance.

elastic spring mechanism = a structure consisting of thin spring-like modified portions of the parapophysis of the 4th vertebrae (Müllerian process) which are attached to the skull by muscles and to the gas bladder. When the muscles contract and relax, the resultant vibrations in the gas bladder produce a growling sound, e.g. certain Clariidae and other catfish families. See also Müllerian process and Müllerian protractor. See also drumming muscle and protractor post-temporalis mechanism.

elasticity = very fresh fish have elastic flesh; when depressed by a finger, the depression quickly disappears.

elastoidine = a scleroprotein of which the ceratotrichium, *q.v.*, is composed.

elastotrichia = a kind of elastic fin ray.

electivity index = an index (E) showing the degree of choice a predator shows in its feeding behaviour, e.g. of a predator on plankton; E is derived from  $r_i - p_i / r_i + p_i$  where  $r_i$  is percent composition of plankter i in the gut contents and  $p_i$  is percent composition of plankter i in the plankton sample. Values for E range from -1 to +1 with -1 meaning complete avoidance, 0 meaning no active selection, and +1 meaning complete selection.

electotype = an unofficial term in nomenclature for a specimen from a locality other than that of a poorly-preserved holotype, said specimen agreeing closely with the original description. See also epitype and neotype.

electric fish trap = a large wire mesh cage with an open top having electrodes at the mouth. Fish are attracted by electrotaxis to the electrodes and stunned, falling into the trap.

electric fishes = fishes which give out electric currents, e.g. *Electrophorus*, *Torpedo*, *Mormyrus*, based on electric organs. These may be weakly discharging used for orientation and prey detection in murky conditions or strongly discharging and capable of stunning prey and predators.

electric organ = the structure capable of emitting electrical discharges through the surrounding water and which may be used to stun prey, to repel predators or as a radar-like device to detect objects under conditions of poor visibility, e.g. *Torpedo*, *Malapterurus*, *Electrophorus*, *Gymnarchus*, *Mormyrus*, *Astroscopus*.

electric screen = a series of electrodes strung across a waterway to prevent passage of fish, to direct fish into a trap or into a fish pass.

electric smoking = fish smoked by hanging on a two-line wire used as an electrode.

electric tuna hook = an electrified hook which stuns the tuna.

electrical fence = electric screen.

electro-fishing = an electric current will result in fish orienting themselves to the anode and swimming towards it involuntarily thus facilitating capture.

electro-narcosis = immobility as the muscles slacken when electro-fishing.

electro-sensing = the ability of certain fishes to sense electric currents, e.g. sharks.

electro-shocker = a device generating an electrical current used to paralyse or kill fish and facilitate their capture. See electro-fishing.

electro-trawl = a trawl with electrodes in front of the trawl mouth to attract and stun fish.

electrocution = a method of killing fish with electricity to ensure a high quality and appearance.

electrocutor = electro-shocker.

electrocyte = electroplax.

electrogenic = capable of generating electric currents and a painful electric shock, e.g. *Electrophorus*, *Mormyrus*, *Torpedo*.

electrogenesis = the production of electric currents and a painful electric shock.

electrolocation = the ability to use electrical fields to locate objects.

electronic bite alarm = a battery powered device which detects line movement in angling, emitting a buzz or beep and a small light. Often used in ledgering.

electronic nose = a device that analyses vapours close to a product as a measure of quality, rather as a nose can detect different odours. The device has to be trained, e.g. for detection of freshness in a particular species of fish. Not yet in use commercially. Also called artificial nose.

electronic publication = in nomenclature and taxonomy, said of a work issued and distributed by means of electronic signals. To be considered published, such a work must be archived with an organisation other than the publisher. This permits valid publications in taxonomy which are online as long as several hard copies or electronic media are distributed to several institutions.

electrophoresis = the movement and separation of chemicals in a fluid medium under electrical stimulation. Used to determine the chemical content of fishes and other organisms and thereby to distinguish and relate them.

electroplaque = electroplax.

electroplate = electroplax, *q.v.*

electroplax = a disk-like multinucleate cell, numbers of which form electric organs. The electric eel has a stack of several thousand of these cells, each producing 0.15 volts. Also called electrocytes, electroplaques or electroplates.

electroreception = the ability to make and receive electrical impulses and use these to distinguish objects by the different resistance and capacitance values. Fish can communicate by modulating the electrical waveform they generate. Fish may use active electroreception, generating small, usually less than one volt, electrical pulses using an organ in the tail consisting of two to five rows of modified muscle cells called electrocytes. This has a range of about one body length. Fish can also use passive electroreception where the fish senses the weak bioelectric fields of other organisms. This is found in sharks, for example, using the ampullae of Lorenzini, *q.v.*

electroreceptor = an organ which detects the presence of an electric current. They are particularly receptive to their own electrical fields and can detect perturbations caused by other fishes and objects. Found, for example, on such weakly electric fishes as mormyrids and gymnotiforms. Also called tuberous organ or receptor.

electroshocker = electro-shocker.

electrostatic smoking = electrically charged smoke particles rapidly deposited on a fish.

electrotaxis = orientation to electric currents. When exposed to a direct electric current from a fish shocker, fish tend to assume a position parallel to the current with the head towards the positive pole or anode. Also called galvanotaxis.

elementary population = a population of fish in the same biological condition, usually of the same age and with the same biological processes.

element = 1) a unit of some larger structure, e.g. a ray or spine of a fin.

element = 2) elements.

elements = the constituent parts that fall within the limits of a taxon, e.g. species within a genus.

eleutheroembryo = an embryonic phase starting with hatching and ending when most or all of the yolk is absorbed and the fish starts feeding, or until feeding on ovarian secretions ends at birth.

elevate = elevation in rank or taxonomic status, e.g. from subspecies to species.

elevated scale = a scale higher than wide, usually said of anterior flank scales and of the exposed portion of the scale.

elevation = fish elevation (the elevation of a fish above the stream bed measured at the tip of the fish's snout).

elevation in rank = change the standing of a name in nomenclature; the change in position of a name in a taxonomic hierarchy, e.g. from subspecies to species.

elger = an eel spear (archaic).

elide (verb) = to deliberately omit one or more letters within a word, e.g. when making up a scientific name. See elision.

elimination, fixation by = fixation by elimination (the supposed fixation of a type species by the subsequent transfer of all but one of the originally included nominal species from a genus. Not in itself an available method of type fixation).

elision (noun) = the deliberate omission of one or more letters within a word, e.g. when making up a scientific name. See elide.

elittoral = the sea bed zone below the sublittoral down to the limit of light penetration; the sea bed below 40 metres.

ellis = fish brine. Also spelled alex or alix. See also alec.

elongate = of lengthened slender form; longer than deep, e.g. Anguillidae, Stichaeidae.

elongation = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for anglers.

elusive as eels = presumably hard to find and/or grasp, occasionally seen in literature.

elver = young transparent, cylindrical transformed *Anguilla* about 5-8 cm long, at the stage in their migration where they have reached the coasts and begin ascending rivers and have lost the leaf-like leptocephalus form. Also called glass eel.

emaciation = excessive leanness or wasting of body tissue.

emarginate = having an edge slightly concave; shallowly forked (particularly of caudal fin); indented.

embankment = 1) a raised bank confining a river.

embankment = 2) the act of making an embankment.

embayment = 1) an indentation of the shoreline forming a bay.

embayment = 2) formation of a bay.

embedded = enveloped in skin, lacking free edges, e.g. scales of Zoarcidae, Anguillidae

embeddedness = the degree to which dirt or finer material is mixed in with spawning gravel.

embolism = gas bubble disease (supersaturated gases (>115-125%) in water entering the body fluids of fish causing bubbles, an embolism. Often seen in gills, eyes, skin and yolk sacs where membranes are the most gas permeable. Fish often swim upside down or vertically, sometimes looking as if they are gasping for air at the surface and may have exophthalmia. Found below power plants in winter when cold water is rapidly heated by passing through condensers, in hatcheries using borehole water and in aquaria when fresh cold water is rapidly heated. Also called air embolism).

embouchure = the mouth of a river or stream.

embryo = developmental stages to the moment of hatching or of birth. Fish have endogenous nutrition from yolk, or via a specialised absorptive organ depending on ovarian secretions, or via a combination of both these methods.

embryon = embryo.

embryonal stage = pertaining to different stages of fish development in the egg.

embryonate = an egg containing an embryo.

embryonic axis = an elongate thickening of blastoderm tissue; the primitive differentiation of the embryo.

embryonic cannibal live bearer = a reproductive guild (*q.v.*) where only one or a few eggs from the ovary develop into a juvenile. Other yolked ova are fed on by the juveniles as ovulated (oophagy) or less developed embryos are eaten by the more developed ones (adelphophagy). There is specialisation for intrauterine respiration. The largest gain in weight is during intrauterine development, e.g. *Carcharias taurus*.

embryonic coprophagy = excretion of yolk glycoproteins from the gastrointestinal tract of the embryo to the perivitelline space where they are swallowed by the embryo, e.g. in *Neogobius melanostomus*.

embryonic period = the time from union of gametes (or in gynogenetic fishes the triggering of cell division) until exogenous nutrition. This period is characterised by endogenous nutrition from the yolk of the ovum (or in viviparous fishes from an ovarian secretion or combination of yolk and secretion). This period is divided into three phases:- cleavage (beginning of development to beginning of organogenesis), embryonic (organogenesis) and eleutheroembryonic (hatching to external feeding after all or most of the yolk is absorbed).

embryonic shield = a thickened arm of the germ ring representing the future longitudinal axis of the embryo.

*emend.* = abbreviation for *emendatus*. The abbreviation precedes the name of the author effecting the change in a scientific name.

emendation = in nomenclature, any demonstrably intentional change in the original spelling of an available zoological name, other than a mandatory change; a name of which the spelling has been altered. Does not include emendation of the scope of application of a name, which equals an emended diagnosis (*q.v.*). Emendations may be correct or incorrect, depending upon whether the changes are in accordance or not with the International Code of Zoological Nomenclature. A justified emendation is the correction of an incorrect original spelling (and takes authorship and date of the original spelling). An unjustified emendation is any emendation other than a justified emendation (the emended name is treated as a new name with its own authority and date).

*emendatus* = emended or altered (by); used where the author has changed the original spelling of a taxon without excluding the type of the name. Abbreviated as *emend.*

emended diagnosis = change in the scope of application of a name, involving a change in the diagnosis (*q.v.*) of the taxon. Not the same as emendation (*q.v.*).

emerge = 1) hatch from an egg.

emerge = 2) come up out of the water (as in hatching insects).

emergence = departure of fry from the gravel into the water column.

emergence trap = a device for trapping fish (and insects) as they emerge from the gravel into the water column.

emergent vegetation = plants growing in water but emerging from it, usually at the water's edge.

emerger = 1) a stage in the life cycle of an aquatic insect when it swims to or near the surface to hatch, changing from a nymph or pupa to a winged adult. Fish may concentrate to feed on emergers.

emerger = 2) an artificial fly tied to imitate an emerger by anglers.

emersed vegetation = emergent vegetation.

emigration = the movement of individuals out of a population or from one area to another.

Emperor's pike = an *Esox lucius* reputedly caught in a lake in Württemburg in 1497 with a copper ring around the gill region. The ring bore an inscription intimating that the pike had been placed in the lake by Emperor Frederick II in 1230, making the pike 267 years old. A nineteenth century study of the skeleton of this fish preserved in Mannheim Cathedral showed it to have more vertebrae than a single pike should have and the story is considered a fake.

empty-gutted = fish without food in the intestine.

emulsion = a fertilizer emulsion produced from the liquid remains of processed fish in fish meal and oil industries.

EN = endangered, *q.v.*

en tresse = a platted fillet where the backbone and bones are removed leaving the fillets attached to the head.

enamel = a shiny hard material covering the dentine of teeth and the surface of some scales (cosmoid and placoid scales). This is the hardest substance produced by vertebrates. Of ectodermal origin, produced by ameloblasts. Consisting of crystals of a calcium phosphate-carbonate salt (apatite) cemented in an organic matrix.

enameloid = a mesodermal derivative laid down at the outer surface of mesodermal papillae as a form of bone with greater density and mineralisation than dentine. Found in the scales of Palaeozoic fishes as a superficial layer over a dentine structure.

encapsulated egg = an egg contained in either a thick horny, or thin membranous case, e.g. Elasmobranchii.

encircling gillnet = used in shallow water with the floatline remaining at the surface; after the fish have been encircled by the net, noise or other means are used to force them to gill or entangle themselves in the netting surrounding them.

enclosed sea = a gulf, basin, or sea surrounded by two or more States and connected to another sea or the ocean by a narrow outlet or consisting entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal States.

enclosure = a fence or barrier which encompasses or shuts in fish.

encounter rate = encounters per unit of gear per unit time.

encounters = the numbers of a species that are caught by fishing gear but are released voluntarily or by regulation.

end fly = trailer (1) the hook at the end of the line in fly-fishing (Scottish dialect)).

end rope = a line connecting the end of the first or last section of a longline backrope or string to the dan line (all q.v.). Also called back of line, dumb string, longline, dummy, end tow, lud tow and spreadline.

end tow = end rope.

endangered = said of a taxon facing imminent extirpation (nationally) or extinction (world-wide). In the IUCN Criteria for threatened species, a taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future. Abbreviated EN.

endangered collection = a collection of museum specimens that may be lost to the scientific community as it is no longer or soon may be of no interest to its current owner. See also orphan collection.

endemic = restricted to a certain region; peculiar to; native to.

endemic centre = an area having a unique fauna, often classified as an area with five or more endemic species.

ending = the termination of a scientific name. The letters at the end of genus-group name must be, or be treated as, a singular name in the nominative case which indicate the gender of the word. The letters at the end of an adjectival species-group name which must agree in gender form with the gender of the generic name with which the species-group name is combined. The letters at the end of a species-group name which, if the name is the genitive case of the name of one or more persons, or a place, or other entity associated with the taxon, form the genitive case and reflect the gender and number, e.g. -*i* if of a man, -*ae* if of a woman, -*orum* if of women, (or men and women together), -*arum* if of women. The letters at the end of the genitive case of a generic name which are deleted to form a stem, before adding a suffix to form a family-group name.

endless trolling line = a slowly moving looped trolling line. The line is carried down to a specific depth, returned to the surface, passes over the vessel so that the catch can be removed and hooks re-baited, and then on down again.

endo- (prefix) = within, inside, inwards, inner.

endobenthic = living within the sediment of a lake or sea floor; infauna. Also called endobiontic.

endobiontic = endobenthic.

endocast = a cast of the interior of a structure, e.g. part of a fossil showing the lumen of the gut.

endochondral = refers to skeletal elements which are formed in cartilage and which later ossify. Also called replacement bone because it gradually replaces the pre-existing cartilage.

endocranum = that portion of the neurocranium consisting of the elements surrounding the olfactory, optic and otic capsules and the anterior end of the notochord.

endogamy = inbreeding; selection of a mate from a small kinship group.

endogenous feeding = a type of nutrient acquisition during fish ontogeny, usually from yolk but also from a maternal-embryonic exchange. See exogenous and absorptive feeding.

endolateral circumorals = large teeth immediately on each side of the mouth opening in lampreys (Petromyzontidae). Also called endolaterals.

endolaterals = endolateral circumorals.

endolymph = the watery fluid in the membranous labyrinth of the ear.

endolymphatic duct = a tube from the utriculus opening on the dorsal surface of the head in Elasmobranchii and terminating in the endolymphatic sinus in Teleostomi. Also called ductus endolymphaticus.

endolymphatic pore = the external opening of the endolymphatic duct.

endolymphatic sinus = a chamber at the outer end of the endolymphatic duct in Teleostomi.

endoparasite = an internal parasite, e.g. the fish *Carapus apus* living in the body cavity of holothurians and feeding on the gonads and water lungs. But see also inquiline.

endopsammic = living on the surface of sand.

endopterygoid = metapterygoid (the deep, paired, endochondral bone forming the posterior end of the palatoquadrate and connected with the hyomandibular. Absent in many modern Teleostei, it bears teeth in the Albulidae. Also called mesopterygoid and entopterygoid).

endoreic = endorheic.

endorheic = said of an area where rivers arise but do not reach the sea, drying up or terminating in a closed basin.

endoskeleton = the skeleton proper; the inner bony support for the body.

endostyle = a longitudinal ciliated groove on the ventral wall of the pharynx which produces mucus to gather food particles in Amphioxo and the ammocoete stage of Petromyzontiformes. In the latter it changes during development into the thyroid gland. Also called hypopharyngeal groove.

endozooic = living inside an animal, e.g. carapids in echinoderms.

English knot = fisherman's knot (a knot for tying the ends of two lines together. Various websites have animated steps showing how to tie this knot).

English shore = that area of the coast of Newfoundland where the English had fishing and curing rights; originally from Cape Bonivista to Trepassey. The extent varied with the vagaries of fortune (*cf.* French shore).

engrailed = 1) indented along an edge with small curves. Opposite of *invected*.

engrailed = 2) having a margin or edge of small raised dots.

engulfer = a piscivore that swallows prey whole.

engybenthic = pertaining to organisms near the benthos.

engyodontic stage = an early stage in an anguilliform larva characterised by few, needle-like teeth, upper and lower jaws of equal length, an undifferentiated finfold, no nasal capsule, no hypurals, straight notochord tip, and the head and preanal region of the body relatively large. Precedes the euryodontic stage.

enhaline = salinity approximating sea water. See also *ensaline*.

Enhanced Inspection List = in food inspection, a list maintained by the Canadian Food Inspection Agency which identifies imported fish products about which the Agency has information indicating the product may be unsafe or unwholesome, and for which the Mandatory Inspection List is not effective in managing the product safety risk. Abbreviated as EIL. Import of products on the EIL requires mandatory proof of product compliance.

enhancement = release of fish from an aquaculture facility to increase the size or growth of a wild fishery or other stock. The releases may be fry or older fish.

enhancement programme = a stock enhancement program to enhance or increase the size or growth of the fishery resource stock.

enkan-hin = shioboshi (whole or split fish dried after soaking in salt water or dry salt (Japan). Usually the name of the fish used is appended).

Enki = the Sumerian god of water, his symbols being a goat and a fish, later combined as a single beast, the Capricorn, which became one of the signs of the zodiac. See also Ea.

enmesh = to catch, entrap or entangle fish in the mesh of a net.

enrichment = addition of nitrogen, phosphorous and carbon compounds or other nutrients into a water body. This increases the growth of algae and other aquatic plants. Enrichment often results from the inflow of sewage effluents or from agricultural run-off, or may be deliberate to increase productivity in aquaculture.

enrobing = coating (fish products may be marketed with a coating, e.g. of batter and breadcrumbs).

ensaline = salinity approximating sea water. See also *enhaline*.

ensiling = preservation of dead fish, offal and wastes from an aquaculture facility in an acidic medium.

entad = inwards, towards the centre or interior; internally.

entamoebiasis = an infection with protozoans of the genus *Entamoeba*.

entangling net = a vertical gill or trammel net that is hung loosely such that fish become entangled rather than gilled.

enteric redmouth disease = a systemic bacterial disease caused by *Yersinia ruckeri* found mostly in salmonids. Symptoms are severe congestion, septicaemia and haemorrhage in head tissues such as the palate and operculum with the lower jaw being eroded. Internal organs can also be infected. Abbreviated as ERM. Also called Hagerman redmouth disease.

enteric septicaemia = a disease caused by the bacterium *Edwardsiella ictaluri* affecting fingerling and yearling catfish. Characterised by a raised or open ulcer on the frontal bone, hence the alternate name of hole-in-the-head disease.

enteritis = a bacterial disease, possibly *Aeromonas punctata*, causing an expanded abdomen with red blotches, fins are congested, the anus is red and swollen, pressure on the belly causes a yellow mucus discharge from the anus, the intestinal wall is inflamed and peels off. The fish shows loss of appetite, swims slowly and alone, and death results.

entero- (prefix) = the intestine.

enterprise allocation = a quota from a particular fishery stock allocated to one company operating more than one vessel. Must be fished during the year allocated although timing is up to the company and the allocation can be transferred to another company. Abbreviated as EA.

entire = smooth edged; lacking serrations or spines.

entity = a taxonomic unit. See taxon.

ento- (prefix) = within, inner.

entoglossum = lingual plate (a dermal toothed bone covering and sometimes fusing with the basihyal, e.g. in Osteoglossidae. Also called glossohyal, dermentoglossum, os entoglossum, supralingual or basihyal dental plate).

entopterygoid = 1) metapterygoid (the deep, paired, endochondral bone forming the posterior end of the palatoquadrate and connected with the hyomandibular. Absent in many modern Teleostei, it bears teeth in the Albulidae. Also called mesopterygoid and endopterygpoid).

entopterygoid = 2) tooth-bearing plates flanking the parasphenoid in certain Sarcopterygii.

entrained = pulled along by a current.

entrainment = 1) the incidental trapping of fish in intake water used for cooling electrical power plants, in waters being diverted for irrigation, or in any artificial construction.

entrainment = 2) the synchronisation of one biological rhythm to another.

entrapment gear = any fishing gear that traps fish; may be fixed or movable but all have some means of preventing the fish escaping once they enter the trap.

enumeration = the act of counting fish returning to spawn.

enveloping layer = the outermost layer of cells surrounding the embryo that become very flattened in the blastula and give rise to the periderm.

envenomation = to sting or to impregnate an organism with a toxin by means of a venom apparatus (a tooth or spine with poison gland or poisonous tissue).

environmental disease = a disease in fish caused by an unfavourable environment, e.g. lack of oxygen, temperature variations.

environmental gill disease = swollen gills caused by an irritating pollutant.

Environmental Impact Statement = a document prepared to describe the effects of proposed activities (such as implementation of a fisheries management plan) on the environment. Impacts can be positive or negative or both and the document may also describe ways to mitigate impacts.

environmental resistance = the difference between the potential ability of a population to increase and the actual observed performance.

environmentally sustainable fishery = a fishery that sustains all parts of the ecosystem and does not cause any long-term or permanent change.

enzootic = a disease present in organisms all the time but in small numbers of individuals at any one time (equivalent to endemic in humans). See also epizootic.

Eocene = a geological epoch within the Tertiary Period ca. 54-38 million years ago.

epal = relating to the upper gill arch, e.g. epibranchials, hyomandibula, palatoquadrate. Compare ceratal.

epaxial = any structure morphologically dorsal to the horizontal plane of the notochord or vertebral column; body muscles above the horizontal septum.

ephemeral = 1) short-lived, transitory.

ephemeral = 2) used to refer to streams which flow only in direct response to precipitation and whose channel is at all times above the water table.

ephemeral = 3) said of publications that become obsolete shortly after issue, e.g. newsletters, newspapers, advertisements, etc. These may present problems if new species were described or other significant biological information was published in them.

ephemery = a descriptive term for the life cycle of tadpole gobies (*Benthophilus* spp.) which live about a year, attain maturity at 6-7 months, and die after spawning.

epi- (prefix) = upon, on the surface of, above.

epibaseost = the distal pterygiophore articulating with the dorsal and anal fin rays.

epibatic = said of a caudal fin with the upper lobe longer.

epibenthic = located on the bottom or floor of a water body, rather than in the bottom.

epibiont = an organism that lives on the outside of another organism.

epibiotic = living attached to another organism without benefit or detriment for the host.

epiblast = the outer of two layers of the blastoderm that form during gastrulation. Corresponds to the primitive ectoderm during gastrulation and to the definitive ectoderm after gastrulation.

epiboly = the thinning and spreading movement of the embryonic cell mass over the surface of the yolk, eventually encompassing the yolk completely.

epibranchial = a deep cartilage bone on the upper part of the gill arch below the uppermost element, the pharyngobranchial. May occur on arches 1, 2, 3, 4 and be covered with toothed pads.

epibranchial organ = a paired dorsal diverticulum at the posterior limit of the pharynx in certain microphagous fishes. Also called gill-helix, pharyngeal organ, or pharyngeal pocket. In all forms with these organs, except some characids, prominent gill rakers extend into the organ dividing its cavity into two parts, one confluent with the pharynx, and one with the opercular cavity. Small food particles, generally plankton, are retained by the rakers, consolidated by mucus and squeezed out into the oesophagus. Found in Heterotidae, Characidae, Chanoidei, Gonorhynchoidei, Clupeidae and Engraulidae.

epicaudal lobe = a median terminal lobe of the caudal fin characteristic of coelacanths.

epicentral = a short, rod-like bone attached to the centrum of the anteriormost vertebrae, e.g. *Merluccius* has 3-4 pairs.

epicercal = a caudal fin with the upper lobe the longer, upwardly tapering, with the skeletal elements forming the upper margin of the fin. Also called heterocercal but this perhaps applies to both epicercal and hypocercal (lower lobe longer).

epicontinental = found in or on a continent or continental shelf. Epicontinental seas abound in fishes.

epidemic spawning = simultaneous shedding of gametes by a large number of individuals, such as the whole population, so chances of fertilisation are high.

epidermis = the outermost of the two layers of the skin. Of ectodermal origin and comprising 4-6 cell layers in Elasmobranchii and 10-30 in Teleostei. In Cyclostomata the epidermis secretes a thin acellular cuticle also seen in some Teleost pearl organs. Overlies the dermis.

epifauna = animals living on the surface of the bottom or floor of a water body. Does not include organisms burrowing into the floor but does include those organisms living on others.

epigean = surface dwelling, as opposed to hypogean, ipogean or "cave" fishes.

epigenetic = all processes relating to the expression and interaction of genes.

epigonal organ = an elongate paired tissue ventral to the kidneys and partially enveloping the anterior gonads in Elasmobranchii. Apparently important to the immune system.

epihyal = the deep, endochondral bone at the upper end of the hyoid arch below the interhyal. It joins the hyomandibular and the symplectic through the interhyal, and articulates with the ceratohyal by a suture in some fishes, e.g. Gadidae. May bear a dentigerous plate. Also called dorsal ceratohyal or posterothyral as it is considered to be the dorsal ossification of the ceratohyal. May or may not be homologous with the epal element of the branchial arches.

epilimnion = the warm uppermost layer of water in a stratified lake, above the thermocline.

epimandibular cartilage = palatoquadrate (the cartilaginous, functional upper jaw of Elasmobranchii and Holocephali and the embryonic upper jaw of other gnathostome vertebrates. In adult Dipnoi, Crossopterygii and Actinopterygii, produces the autopatine, metapterygoid and quadrate bones. Also called palatoquadrate or palatoquadratal bar, palatoquadrate cartilage, pterygoquadrate bar, epimandibular cartilage and maxillar cartilage).

epimeralium = epineural.

epineural = a slender bone which lies in the myocomma and projects backwards and upwards from the neural arch and spine. Epineurals may be forked.

epioccipital = epiotic, q.v.

epiotic = the deep bone and the superficial bone overlying it which form the upper element of the otic capsule, and lie posterior to the parietal, ventral to the supraoccipital, and dorsal to the pterotic. It covers the posterior semicircular canal. It is considered to be an ossification of the occipital arch that has invaded the otic region and so is often called epioccipital.

epipelagic = pertaining to the relatively well-lit, warm and blue water of the ocean from the surface down to a depth of about 200 metres.

epiphysial apparatus = consists of two median dorsal projections from the diencephalon - an anterior parietal body and a posterior pineal body or epiphysis. These bodies are light sensitive and influence the melanophores and the behavior of the animal.

epiphyte = organisms growing on or associated with the substrate.

epipleural bone (rib) = one of a series of bones found in the horizontal septum (separating the upper and lower muscle masses of the body - epaxials and hypaxials). Epipleural ribs may be associated with the anterior pleural ribs, e.g. in *Perca* or with the vertebra, e.g. in Gobiidae. Also called dorsal rib and intermuscular bone.

epipterygial = dorsal to the pectoral fin.

episom = epaxial.

episternal = urohyal (a flat, median, deep, endochondral bone below the ceratohyal; a tendon bone arising in the septum between the longitudinal muscles of the isthmus. Absent in such primitive fishes as *Lepisosteus*. Also called clidost, interclavicle and parahyoid).

"epistylis" = red sore disease (a disease caused by a ciliated protozoan (*Epistylis* and *Heteropolaria* spp.) exhibiting as ulcers or cotton-like growths on the skin, scales and fin spines causing a red lesion, and also found on eggs).

epitegum = a shield element of jawless fishes, e.g. the ventral shield is considered as a single epitegum.

epithelial fringe = oral fimbria (one of a series of small tag-like appendages around the perimeter of the oral disc of lampreys (Petromyzontiformes), presumed to help create an effective seal when the lamprey is attached to its host and also probably sensory. Also called fringed processes, leaf-like processes, fringed lappets, leathery appendices and leathery appendages).

epitheliocystis = a chlamydial infection of fishes that may show no symptoms or exhibit as respiratory distress. Numerous white cysts develop on the gills and skin.

epithelioma papulosum = carp pox (one of the oldest known fish diseases found in cultured carp, other cyprinids, pike-perch and aquarium fishes. It is caused by *Herpesvirus cyprini*. Also known as carp papillomatosis, epithelioma papulosum, fish pox, cyprinid herpesvirus I (CHV). Skin lesions appear as the water temperature drops in winter as small milky-white spots that merge and cover large skin areas).

epithet = 1) the second word of a binomial name of a species (or the second and third of a subspecies); specific name; trivial name.

epithet = 2) a word or phrase involving abuse; seems to be a common usage among anglers and scientists endeavouring to capture fish.

epitheta hybrida = epithets made up of parts of words from two or more different languages.

epitheta specifica rejicienda = rejected specific epithets.

epitype = a term in nomenclature for a type designated to fix the application of a name, the type of which is demonstrably ambiguous or cannot be critically identified for the purposes of the precise application of the name of a taxon.

epizootic = a disease attacking many animals in a population in a short time. Equivalent to epidemic in humans. See also enzootic.

epizootic ulcerative syndrome = an epizootic in freshwater and estuarine fish of warm waters. It is characterised by an invasive *Aphanomyces* infection and ulcerative lesions.

epontic - referring to organisms closely associated with sea ice, attached, in interstices between ice crystals, or within channels in sea ice where some fish may be found.

eponym = named for a person, e.g. *Glyptothorax silviae* (Sisoridae) named for Sylvie Coad but note that the Latin origin of the name forms the root for the eponym.

eptatretin = a potent cardio-stimulant obtained from the branchial heart of *Eptatretus stouti* (Myxinidae). The substance is reported to be a highly unstable aromatic amine.

epural = an elongate detached bone above the urostyle and behind the last neural spine supporting caudal fin rays. Apparently derived from neural spines or the urostylic centra; dorsal homologues of the hypurals. Vary in number between one in advanced fishes to three in primitive actinopterygians.

equal = the same, said of jaws of the same length.

equals sign = "=". Often used to indicate subjective synonyms in nomenclature.

equatorial current = 1) ocean currents flowing westerly near the equator. There are two in each of the Atlantic and Pacific oceans, one north of the equator (the North Equatorial Current) and one south (the South Equatorial Current) separated by the easterly flowing Equatorial Countercurrent.

equatorial current = 2) tidal currents occurring semi-monthly as a result of the moon being over the equator.

equatorial tide = a tide occurring semi-monthly as a result of the moon being over the equator.

equilibrium = when fishing and natural mortality, exploitation pattern, growth and recruitment do not change from year to year; when such factors have been in effect long enough to affect all ages for the whole exploited life. Also called steady state.

equilibrium catch = the catch (in numbers) taken from a fish stock when it is in equilibrium with fishing of a given intensity, and (apart from the effects of environmental variation) its abundance does not change from one year to the next. Also called sustainable yield, equilibrium yield. Abbreviated as CE or  $C_E$ .

equilibrium yield = the yield in weight taken from a fish stock when it is in equilibrium with fishing of a given intensity, and (apart from effects of environmental variation) its biomass is

not changing from one year to the next. Also called sustainable yield, equivalent sustainable yield. Abbreviated as YE or  $Y_E$ . No stock is really in balance with fishing effort because effort cannot be maintained at the same level and the stock is always changing in response to environmental variables.

equivalent sustainable yield = equilibrium yield.

erect = establish or coin, as for a scientific name.

erectile = capable of being lifted upright.

erisma = the fused first two proximal pterygiophores; long and well-developed in *Solea*.

ER = abbreviation for enteric redmouth disease, *q.v.*

*err. typ.* = abbreviation for *errore typographico*, meaning typographical error, *q.v.*

*err. typogr.* = abbreviation for *errore typographico*, meaning typographical error, *q.v.*

errata = plural of erratum.

erratic parasite = a normal parasite in an unusual location.

erratum = 1) an error.

erratum = 2) a printed correction to a published work appearing on a separate slip inserted into the publication, or appearing in a later issue of a journal.

error = an incorrect spelling in a name, or other word. A copyist's error is an incorrect spelling made in copying, an inadvertent error is an incorrect spelling, such as a *lapsus calami*, or a copyist's or a printer's error, not intended by the original author, and a printer's error is an incorrect spelling made in type-setting (often called typographical error). Such errors may have significance in nomenclature.

*errore typographico* = a typographical error. Abbreviated as *err. typ.* or *err. typogr.*

eructation = burping, belching or ructus is the release of gas from the digestive tract. In fishes this may be from the vent, or from the gas bladder connected to the gut via the pneumatic duct, and thence the mouth. Some eructations may be just emptying the gas bladder but others appear to be a deliberate sound production as it does not vary over time, e.g. in certain eels and catfishes.

erythrism = a red or orange pigmentation seen in aquarium fishes, e.g. orange swordtail (*Xiphophorus helleri*) and the in nature, e.g. the cichlid red devil (*Amphilophus labiatus*).

erythro-melaniridosomes = association of erythrophores, melanophores and guanophores.

erythrocyte = red blood cell.

erythroderma = a bacterial infection (*Pseudomonas fluorescens*) usually through lesions found in major carps. Symptoms include inflammation bleeding from the skin, loss of scales, bloodshot fin bases, fraying of fins, red blotches around the mouth and occasionally congestion and inflammation of the intestines.

erythroiridosomes = association of erythrocytes and guanophores.

erythrophore = a chromatophore exhibiting red (or orange) color. Contains a carotenoid pigment.

esca = the specialized lure on the outer end of an illicium. Sometimes luminous, worm-like or fish-like in form, e.g. in Ceratioidei.

escabèche = a cold marinade made of olive oil, vinegar (or citrus juice) and spicy herbs. Used to preserve cooked foods such as small fish which are headless, fried or lightly browned and marinated for a day. Served as an hors d'oeuvre. The word is Spanish in origin or possibly from the Farsi sikbag meaning acid food.

escapee = specimen of a cultured species that escapes from an aquaculture facility. It may carry diseases or parasites or interbreed with wild stock.

escapement = number of migratory fish that reach a favourable spawning area annually. Refers to the fish that pass through a fishing area unscathed and reach the spawning grounds; usually said of anadromous fish.

escapement curve = the relationship between size (or age) and the probability of a fish escaping from the gear after having encountered it, e.g. swimming through the mesh of a net, the sorting grid of a trawl, or the escape gate of a trap. Sometimes called selectivity curve.

escapement goal = a predetermined, biologically-derived number of salmonids that are not harvested and will be the parent spawners for a wild or hatchery stock of fish.

escapotype = a joke name in nomenclature for a type specimen that escaped from capture; an alivotype that got away.

esociform = pike-shaped.

esophagus = that tubular portion of the gut between the pharynx and the stomach. Also spelled oesophagus.

*Esox* epidermal proliferation-associated virus = virus-like particles found in epidermal lesions in northern pike (*Esox lucius*).

*Esox* lymphosarcoma-associated virus = a leukovirus-like agent isolated from pike with lymphosarcoma but relationship to latter unknown.

essence d'Orient = silvery crystals of guanine in scales which are extracted and used to make a pearl essence for artificial pearls.

essential fish habitat = any habitat that is of basic importance to the survival and well-being of a fish population or community, either a habitat used throughout life or for a specific activity such as spawning or feeding.

establish = to publish a zoological name so that it is available in the meaning of the International Code of Zoological Nomenclature, or make available (a name that was previously unavailable) for whatever reason.

established = successful growth and reproduction in a given area, usually in terms of an introduced population.

established species = valid species (a species that has an existence in the real world and is recognised as such. In opposition to a species thought to be distinct but which does not actually exist, is no longer recognised, or is treated as a synonym). May be confused with the usage of established for an introduced species, and a valid species could be ignored and therefore established is inappropriate.

establishment = 1) the business, and all its parts, of a fish merchant (Newfoundland). Usually refers to the branch of a firm with headquarters in St John's, Newfoundland or Britain.

establishment = 2) the process requiring certain criteria detailed in the Code of Zoological Nomenclature to be fulfilled on publication before a name can be taken into consideration for nomenclatural purposes.

estero = a lagoon with greater salinity at its head than its mouth, since evaporation exceeds precipitation there. Found on desert margins of the American southwest and in Mexico. Also called a negative estuary.

estimated discard mortality = the numbers of fish thrown overboard that die, calculated by observers and from logbook records.

estivation = dormancy during the dry season. e.g. in Dipnoi. Also spelled aestivation.

estuarine (adjective) = condition in that portion of a river, the estuary, where it meets the sea and fresh and salt waters mingle or alternate.

estuarine dependent = fish and other organisms that live in estuarine conditions for all or part of their lives.

estuary (noun) = see estuarine.

esu = an evolutionary significant unit; a segment of a species defined as important in survival and conservation of the species such as a specific spawning run of a salmonid.

et(t) = said of fish ready to take the bait, either individually or in a school (Scottish dialect).

et = and; used to connect names of authors after the scientific name. Often "and" or & is used.

et al. = abbreviation for *et alii*.

*et alii* = and others; used in author citations where the initial author's name is followed by *et al.* to indicate there are more authors.

*et aliorum* = *et alii*.

*et cetera* = and so on. Abbreviated as etc.

*et sequens* = and the following. Used, for example, after a page number to indicate that following pages should also be referred to. Abbreviated as *et seq.*

etc. = abbreviation for *et cetera*.

ethanol = C<sub>2</sub>H<sub>5</sub>OH; used as a 70-80% solution in water for the permanent preservation and storage of fish specimens in museum collections. Also called ethyl alcohol, grain alcohol or spirit of wine.

ethyl alcohol = ethanol.

ethmoid = the deep, embryonic, perichondral, cartilaginous bone ossifying in and around the nasal septum. Later covered by the nasals, prevomer, adnasals (and rostrals) and located anterior to the orbit. It may not ossify in some Teleostei. Also called hypethmoid and dermethmoid.

ethmoid gland = a gland in the ethmoid bone associated with the ethmoid tooth in Monognathidae. Possibly secretes poison.

ethmoidea = plural of ethmoideum.

ethmoideum (plural ethmoidea) = ethmoid.

ethmosphenoid = part of the cranium in front of the intracranial joint in Crossopterygii; behind it is the otico-occipital portion.

ethology = the study of innate behavior; of behaviour in the normal environment of the fish (although often carried out in a simulated environment, the aquarium).

ethyl alcohol = ethanol, *q.v.*

etymology = used in taxonomy for the derivation and meaning of a scientific name.

eu- (prefix) = good, well or stable. Opposite of dys-.

euabyssal = waters of the sea below about 4000 metres.

euautostylic = a jaw suspension in which the jaw is attached directly to the braincase, e.g. in Placodermi.

euhaline = 1) living only in saline inland water bodies.

euhaline = 2) waters containing between 30 and 40 parts per thousand of dissolved salts, i.e. in most cases, normal sea water. Some definitions give 30 to 35 as euhaline and 36-40 as metahaline. See also Venice system.

euhyostylic = condition of the palatoquadrate when it is supported only by a stout hyomandibular and is unattached to the neurocranium. The ceratohyal in euhyostyly is widely separated from Meckel's cartilage.

eulachon oil = oil extracted from *Thaleichthys pacificus* (Osmeridae) in British Columbia and used to flavour foods by native peoples.

eulittoral = the marine intertidal zone subject to wave action; the shore of a lake between high and low water marks.

eupelagic = organisms in open ocean water away from the sea bed.

euphotic zone = the surface waters of the sea or of a lake where enough light penetrates for photosynthesis to occur, down to about 80 metres.

euphosoclistous = having the gas bladder closed, with no connection to the gut.

eupotamic = pertaining to organisms equally capable of living in still or flowing fresh water.

European gill rot = branchiomycosis (a disease caused by the fungi *Branchiomyces sanguinis* and *B. demigrans* found particularly in carp and eels. Respiratory distress is caused by gill necrosis as blood vessels thrombose. Gills become discoloured in patches and rot. Occurs in ponds with high temperatures, excess organic matter and high ammonia levels. Also called gill rot).

ury- (suffix) = wide or broad. Opposite of steno-.

urybaric = tolerant of pressure, hence depth changes. Opposite of stenobaric.

urybasal = having a wide fin base, e.g. in Dipnoi. Opposite of stenobasal.

urybathic = tolerant of a wide range in depth.

urybenthic = living on the lake or sea floor over a wide range of depths.

urycoenose = having a wide distribution; common.

uryhaline = 1) organisms capable of withstanding a wide range of salinity.

uryhaline = 2) water with a salinity of 30.1-40.0 p.p.t. derived from ocean salts.

uryodontic stage = an advanced stage in anguilliform development characterised by three series of relatively short, broad teeth, a relatively shortened lower jaw, the formation of nasal capsules, fins and hypurals, flexion of the notochord and a relatively smaller head and preanal region. Follows the engyodontic stage.

eu<sup>ro</sup>kous = adapted to numerous ecological niches. Opposite of stenokous.

eu<sup>ro</sup>phagous = feeding on a wide variety of foods.

eu<sup>ro</sup>saline = 1) organisms capable of withstanding a wide range of salinity.

eu<sup>ro</sup>saline = 2) water with a salinity of 30.1-40.0 p.p.t. derived from land-derived salts.

eu<sup>ro</sup>thermal = organisms capable of withstanding a wide range of temperature.

eu<sup>ro</sup>thermic = eu<sup>ro</sup>thermal or pertaining to or living in water of wide temperature range.

eu<sup>ro</sup>thermos = able to tolerate wide variations of the temperature in the environment.

eu<sup>ro</sup>topic = having a wide range of geographical distribution.

eu<sup>ro</sup>tropical = occurring throughout the tropics.

eustasy = worldwide simultaneous change in sea level.

eustatic = rise in sea level relative to the exposed land still depressed after melting of the glaciers.

eutrophic = adjective for eutrophy.

eutrophication = the deterioration of the life-supporting features of a lake or estuary caused by excessive pollutants or fertilisation from effluents high in phosphorus, nitrogen and organic growth substances. More decomposing organic matter is produced by the excessive growth of algae and plants than self-purification processes can overcome. It is also the natural aging process of a lake, leading to its disappearance as plants and sediments fill it in.

eutrophy = the condition of a lake which is highly productive and hence the hypolimnion becomes depleted of oxygen (through decay of organic products). Usually having a shallow wide basin with coloured water and abundant littoral vegetation.

euxinic = an environment lacking oxygen and with very little water circulation. From Pontus Euxinus, the Black Sea in reference to the anoxic conditions at depth.

evacuation zone = the anterior-ventral region of the mid- and late gastrula that becomes poorer in cells as they leave by epiboly and convergence.

evanescent = temporary, disappearing.

even-year run = a population of fish that returns to its natural spawning grounds in even numbered years.

evening hatch = the emergence of aquatic insects in the evening; emergence is the transformation of an insect from a swimming to a flying stage at the water surface; a term used by anglers. Hatches attract fish.

evenness = the distribution of abundance such as biomass or individuals among the species within an assemblage.

everglade(s) = marshland covered with grass in places and usually having water.

eversible = adjective for evert.

evert = turn inside out, disgorge; used of guts protruding from the mouth of a fish brought up quickly from depth when the swimbladder expands and pushes internal organs out, and of the lips in kissing gouramies (*Helostoma temminckii*, Helostomatidae).

eviscerated = said of fish having at least the gut and sometimes all the internal organs removed.

evo-devo = an abbreviated form for evolutionary developmental biology.

evolution = descent with modification.

evolutionarily significant unit = a population or group of populations inhabiting a defined geographical area that comprises a unique segment of the species; a distinct population, reproductively isolated from other conspecific populations and is an important evolutionary legacy of the species. Abbreviated as ESU. An ESU is often treated as a "species" in conservation assessments.

evolutionary significant unit = evolutionarily significant unit.

evolutionary developmental biology = an integrated approach to explaining biodiversity, taking into account molecular genetics through embryology, molecular and population genetics, comparative morphology, palaeontology, molecular evolution, ecology and functional morphology. It analyses interactions between development and evolution.

evolutionary tree = a diagram depicting the hypothetical phylogeny of the taxa under consideration. The points where lineages split represent ancestor taxa to the descendent taxa at the terminal points.

EW = extinct in the wild (in the IUCN Criteria for threatened species, a taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form).

EX = extinct (in the IUCN Criteria for threatened species, a taxon is Extinct when there is no reasonable doubt that the last individual has died).

*ex* = from, according to. Sometimes used within an author citation, *q.v.*

*ex aff.* = abbreviation for *ex affinis*.

*ex affinis* = of affinity. Used, for example, to indicate a specimen is similar to a named taxon but not identical.

*ex gr.* = abbreviation for *ex grupo*.

*ex grupo* = of the group of.

*ex nomine* = by or under that name.

*ex parte* = in part, partly. Abbreviated as *e.p.*

*ex situ* conservation = conservation of species or populations outside their natural area of distribution or habitats, cf. *in situ* conservation.

ex- (prefix) = out, beyond.

ex-collection = collection to which a museum specimen formerly belonged.

ex-holotype = part of a holotype separated from the original, e.g. a slide preparation of a structure like scales.

x-isotype = part of an isotype separated from the original.

ex-type = from the type; used for part of the type separated for study, e.g. scales on a slide.

ex-vessel = refers to activities that occur when a commercial fishing boat lands or unloads a catch. For example, the price received by a captain (at the point of landing) for the catch is an ex-vessel price.

ex-vessel price = the value of fish at first sale by fishermen at the dock, distinguished from wholesale or retail value.

exaggeration = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishermen.

*exampli gratia* = meaning for example. Usually seen as its abbreviation, e.g.

exapt = adaptation by selection to a different purpose, e.g. the buoyancy function of the swimbladder was exapted as a respiratory organ in some fishes.

excess capacity = in the short-term, fishing capacity or number of boats that exceeds the capacity required to capture and handle the allowable catch. In the long-term, fishing capacity that exceeds the level required to ensure the sustainability of the stock and the fishery at the desired level. Excess capacity is the difference between current fishing capacity and target fishing capacity ( $Y_c - YT$ )/ $YT$ , in which  $Y_c$  is current yield or catch and  $YT$  is target yield or catch (to be evaluated and compared relative to the same stock size). Also called over-capacity, excess harvesting capacity.

excess fish = the number of hatchery-reared fish that return to their hatchery without being caught.

excess harvesting capacity = harvesting capacity in excess of the minimum or least cost amount needed to harvest the desired quantity of fish.

exchange = specimens sent to another museum for a similar number of different specimens to enhance both institutions' collection diversity or to further research interests of the scientists involved.

excised = margin cut out, concave.

excisura major = the notch in the margin of the fish otolith separating the rostrum and antirostrum.

excisura minor = the notch in the margin of the fish otolith separating the postrostrum and pararostrum.

*excl.* = abbreviation for *exclusus*.

*excl. gen.* = abbreviation for *excluso genere*.

*excl. spec.* = abbreviation for *exclusa speciei*.

*excl. specim.* = abbreviation for *exclusis speciminibus*.

exclamation mark = !. Used on labels, after a museum abbreviation and after a collection number to indicate that the material has been examined by the author of the work.

excluded = 1) said of a work, name or act which is to be ignored for purposes of zoological nomenclature either under the provisions of the International Code of Zoological Nomenclature or because of a disclaimer.

excluded = 2) denoting a specimen or component which has been explicitly omitted or removed from a type series or a name-bearing type.

*exclusa speciei* = with the species excluded. Abbreviated as *excl. spec.*

exclusion zone = an area where fishing or even passage is not allowed, e.g. around historic wreck sites, oil and gas installations.

*exclusis speciminibus* = with the specimens excluded. Abbreviated as *excl. specim.*

Exclusive Economic Zone = waters out to 200 nautical miles (370.40 km) from shore where international waters begin. Reserved to that country for exploitation and management of resources. Also called the 200-mile limit. Abbreviated as EEZ.

Exclusive Fishing Zone = the exclusive fishing zone out to 200 nautical miles, replaced by the EEZ. Abbreviated as EFZ.

exclusive rights = the right to catch fish exclusive to the holder(s) of the right, i.e. the holders can exclude others without the right from catching fish in the fishery.

*excluso genere* = with the genus excluded. Abbreviated as *excl. gen.*

*exclusus* = excluded, used to indicate elements included in a taxon by a previous author or authors, but considered not to belong to it by the writer and excluded from it by him. Abbreviated *excl.*

excreta = faeces, urine.

exemplar = 1) a random sample of a taxon.

exemplar = 2) a taxon selected to represent a taxon of higher rank, e.g. a species to represent a genus.

exerge = an obsolete term for a rank equivalent to a subspecies.

exethmoid = parethmoid (a paired deep bone of perichondral origin lying in the front of the orbit under the prefrontal. Also called pleurethmoid, prefrontal, exethmoid and, incorrectly ectethmoid, as this latter is only in birds).

exhalent chamber = branchial chamber (the cavities in which lie the gills).

exhibit collection = museum specimens on display in a public exhibit. The specimens may be designated specifically for the exhibit and thus may be discarded when the exhibit is closed, or stored separately from the main collection. Specimens from the main or permanent collections may be used in exhibits but do not form part of an exhibit collection.

existence value = the economic value of knowing that a resource exists, whether or not there is the ability to use that resource now or in the future.

exit fishery = a fishery directed at a transient phase in the life cycle, e.g. only the juveniles of a species.

exoccipital = a deep, paired, endochondral bone at the posterior end of the cranium on each side of the foramen magnum, often bearing articular facets for the first vertebra.

exocrine pancreas = a well-defined organ which secretes enzymes into the digestive tract by means of a duct.

exogenous feeding = nutrient acquisition during fish ontogeny by food taken in through the mouth and digested in the intestine. See endogenous and absorptive feeding.

exolaterals = small teeth between the endolaterals (near the mouth opening) and the marginals (which line the margin of the disc) in lampreys (Petromyzontidae).

exophialiasis = infection with the fungi *Exophiala salmonis* and *E. pisciphila*, of particular importance to cage-cultured salmonids. The fish become lethargic, darken, and occasionally dermal nodules develop. Yellow to white granulomas are found in the viscera.

exophthalmia = protrusion of the eyeballs (plural of exophthalmos).

exophthalmos = protrusion of an eyeball. Usually results from liquid or gas accumulation at the rear of the eye socket or by diseases. Also called popeye.

exophthalmus = exophthalmos.

exorheic = an area where rivers rise and flow to the sea.

exoskeleton = hard parts on the body surface developed in the dermis, called membrane or dermal bones (scales, scutes, spines, plates, elements of the head and pectoral girdle, etc.). In bony fishes, many of these bones migrated to deeper layers below the dermis, forming a secondary exoskeleton.

exotic = not native; introduced from a foreign place or country. Exotics are usually from a completely different fauna and may carry diseases and parasites which native fish have no resistance to, be major predators on native species, or compete for habitat and food. Alien, non-native, invasive and non-indigenous are roughly equivalent. See also alien.

expanded feed = in aquaculture, a type of food composed of low-density pellets that sink slowly. May be used to produce diets high in oil. See also extruded feed.

expatriate = an individual of a species which has been transported to an area in which it cannot reproduce and from which it cannot return except by chance, e.g. the myctophid, *Lobianchia dofleini*, in the western Atlantic.

expatriation = the process of expatriating or removal by an agency, such as a current to an environment in which it cannot reproduce and from which it returns only by chance.

expatriation area = an area in which a species cannot reproduce or return from and is present in only through reinforcements from another area.

expedition = 1) an extended fishing trip.

expedition = 2) an investigation made with the hope of discovering information but without any clear evidence at hand when begun.

expendable bathy-thermograph = an instrument that records water temperature with depth. Abbreviated as XBT.

experimental fishing = fishing with new gear to test its effectiveness and its effect on fish stocks.

expiscation = an elucidation or investigation, literally a "fishing out".

expiscator = an investigator, from expiscation.

explicit exclusion = 1) in the Code of Zoological Nomenclature, a statement as to an exception to the application of the Code, or a particular provision.

explicit exclusion = 2) of a specimen, scientific name or type, one stated as excluded from the circumscription of a taxon by the author.

explicit typification = an act of typification in which an author designates the type.

exploitable age = any age of fish in a fishable stock.

exploitable biomass = refers to that portion of a stock's biomass that is available to the fishing gear.

exploitation pattern = the distribution of fishing mortality over the age or length composition of the fish population, determined by the type of fishing gear, area and seasonal distribution of fishing, and the growth and migration of the fish. The pattern can be changed by modifications to fishing gear, e.g. increasing mesh or hook size, by changing the ratio of harvest by gears exploiting the fish (gill net, trawl, hook and line, etc.), a modification of the mix of gears in a multi-gear fishery, or by a change in fishing practice such as shift in area or time period fished (possibly as a result of a regulation such as a closed area or season). The pattern is expressed as a series of values ranging from 0.0 to 1.0.

exploitation rate = the proportion of a population at the beginning of a given time period that is caught during that time period (usually on a yearly basis). A catch in a year of 10 fish out of a stock of 100 is a 10% exploitation rate. Also the ratio of fish caught to total mortality (= F/Z when fishing and natural mortality take place concurrently (Ricker, 1975)). Also called rate of exploitation. Abbreviated as E.

exploitation ratio = the ratio of fish caught to total mortality (F/Z).

exploited = fished; harvested and put to use.

exploratory fishing = attempts to discover new resources with proven gear, to assess stocks and environmental conditions.

exposed field or portion = that part of a scale not covered by another scale. Characterized by the ridges low or missing and the possible presence of chromatophores (never in other fields) and ctenii.

exserted = projecting; extending beyond the general level, e.g. the lower pectoral rays of Triglidae which extend beyond the fin membrane.

extant = currently alive as applied to a taxon or of a specimen meaning still in existence. Opposite of extinct in the former case.

extended family = the family condition in Cichlidae where the parents as well as the offspring of previous spawning care for the young. Found in cavity brooders such as *Julidochromis* and *Neolamprologus*.

extended loan = a specimen or specimens loaned to a museum or scientist for a long period of time, sometimes indefinitely.

extended river = the lower reach of a coastal river that has been lengthened seaward by lowering sea level.

extender = a chemical solution used to dilute fish sperm for use in artificial fertilisation or cryo-preservation.

extensile = capable of being extended.

extensible = extensile.

extensive culture = aquaculture in ponds by subsistence workers where low densities of fish are kept with minimum control, supplementary feeding, cost and profit.

extension = lengthening of the embryonic axis during the gastrula and early segmentation periods.

extension blood knot = a knot use for tying a dropper line, *q.v.*, to a leader when two or more flies are used at one time. Various websites have animated steps showing how to tie this knot.

extension piece = tapered sections of netting between the belly and the batings and the cod end of a trawl. Also called pipe, swallow piece, tail, tail piece, taper, Y-piece.

extensive pond culture = extensive culture.

extent of occurrence = the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy. This measure may exclude discontinuities or disjunctions within the overall distributions of taxa, e.g. large areas of obviously unsuitable habitat.

exterilium = a detached and trailing gut with many cirri and the anal opening on the dorsal edge found in larvae of some species, possibly of Brotulidae (Fraser and Smith, 1974).

exterior = outer.

external brooder = an ecological group comprising a series of reproductive guilds (*q.v.*) where the eggs are transferred to some structure on the fish for incubation. Structures vary from the mouth and gill cavity to specialised marsupia.

external gill = a gill extending beyond the gill slit or operculum, often found in larvae. e.g. embryos of some viviparous Elasmobranchii, the larvae of *Gymnarchus*, *Polypterus* and *Protopterus*.

external yolk syncytial layer = portion of the yolk syncytial layer outside the blastoderm margin during epiboly.

extinct = 1) no longer living as applied to a taxon. Opposite of extant.

extinct = 2) in the IUCN Criteria for threatened species, a taxon is Extinct when there is no reasonable doubt that the last individual has died. Abbreviated as EX.

extinct in the wild = in the IUCN Criteria for threatened species, a taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form. Abbreviated as EW.

extinction = death of all members of a clade or taxon.

extinction coefficient = a coefficient measuring the rate of extinction, or diminution, with distance of transmitted light in sea water.

extirpated = no longer living in an area under consideration, e.g. nationally; locally extinct.

Extra E = the highest grade of freshness in the European community.

extra- (prefix) = outside, beyond.

extra large = a grade of dried and salted cod (Newfoundland).

extra small = a grade of dried and salted cod (Newfoundland).

extrabranchial chamber = space between the operculum and the gills.

extractive use = removal from a resource, such as fish by fishing.

extralimital = beyond the limits (of a regional study or an identification key).

extramedullary haematopoiesis = in fishes, formation of blood outside the haematopoietic tissue in the kidney.

extrascapula (plural extrascapulae) = small bones bordering the posterior margin of the skull roof in primitive Teleostomi. They apparently originate from enlarged scales. One of a series of from 2-8 bones known variously as cervicals, extrascapulars, nuchalia, postparietals, scale bones, supratemporals or tabulars.

extrascapulae = plural of extrascapula.

extreme fluctuations = extreme fluctuations occur in a number of taxa where population size or distribution area varies widely, rapidly and frequently, typically with a variation greater than one order of magnitude, i.e. a tenfold increase or decrease.

extreme high water = the highest elevation reached by the sea as recorded by a water level gauge during a given period.

extreme low water = the lowest elevation reached by the sea as recorded by a water level gauge during a given period.

extrinsic gas bladder muscles = muscles with one end inserting on the gas bladder and the other end inserting elsewhere, as opposed to intrinsic.

extrinsic eye muscles = muscles attached to the eyeball and orbital wall for eye movement. The same in jawed and jawless fishes except the superior obliques which attach posteriorly in the orbit in the jawless fishes instead of anteriorly.

extrinsic sonic muscles = usually a pair, two pairs or more rarely three pairs of muscles inserted on the gas bladder and a neighbouring structure such as a bone (ribs, parapophyses), perhaps via ligaments. Insertions vary with the species and family. The muscles produce sounds by contracting the gas bladder. See also intrinsic sonic muscles.

extruded feed = food that has been extruded from a machine having been heated to 120°C under high pressure. The resulting pellets float, have better digestibility of starch but may be poor in vitamins. See also expanded feed.

extrusion = the process of pushing out eggs by a spawning female.

eye = 1) the point of attachment for the line on a hook or anchor.

eye = 2) opening at the inner end of the funnel in fish traps and pots.

eye = 3) a reference to markings on a fish body, often incorporated in the fish name.

eye = 4) as fish eye, variously an eye like that of a fish, a wide-angle lens on a camera covering about 180°, a weld defect having a hole or piece of matter surrounded by a circular area of brightness, a diamond or other gem cut too thin for proper brilliance, a small blemish in finished paper caused by a crushed and glazed particle, a cold or suspicious stare, blank, expressionless, ocular lymphomatosis in fowl, in oil drilling fluids, slang for a globule of partly hydrated polymer formed by poor dispersion during mixing. About 0.2-0.5 inches in size, they consist of a granule of unhydrated polymer covered by hydrated polymer and so are impervious to water and do not disperse.

eye = backstrop norman (a special u-shaped bolt to which the backstrop is attached).

eye diameter = the greatest distance in a straight line across the cornea between the borders of the cartilaginous eye-ball. Often misapplied to orbit diameter, q.v.

eye fluke disease = a disease caused by the metacercaria of strigeid trematodes (*Diplostomum*). The life cycle involves a snail, fish and the final host, a bird. Larval flukes invade the fish through the gills and reach the eye capillaries through the blood stream. Blindness can result. Symptoms include cloudy eyes and popeyes but these also have other causes. Small white cataracts may develop. Wild snails should be avoided in the aquarium. Also called diplostomiasis.

eye muscles = the muscles that move the eye up, down, backward and medially. These are the inferior, medial, lateral, and superior recti, plus the superior and inferior oblique muscles.

eye notch = in sharks, a sharp anterior or posterior indentation in the eyelid, dividing the upper and lower eyelids.

eye protrusion = exophthalmia, popeye.

eye spot = see eye-spot.

eye stalk = a movable peduncle bearing the eye of varying length.

eye stripe = a stripe of pigment passing through the eye region on the head of a fish, a form of disruptive colouration, *q.v.*

eye worm disease = eye fluke disease.

eye-fork length = straight or curved-body length between the posterior orbit and the fork of the tail; used in measuring billfish species. Abbreviated as EFL.

eye-spot = 1) a photosensitive structure in the anterior ventral surface of the brain in Amphioxus; contains primitive homologues of rods and cones and is probably able to detect differences in quantity of light but incapable of forming an image.

eye-spot = 2) any spot resembling an eye, often functioning to distract or confuse predators. Also called an ocellus.

eyed = eggs at a development stage of 38 days, e.g. in chinook salmon at 45°F (stages are green at 0 days, eyed at 38 days, sack fry at 69 days, swim up at 92 days and button up at 115 days).

eyed egg = a fish egg containing an embryo that has developed enough so that the black spot of the eyes are visible through the egg membrane. Indicates that the egg is less sensitive to movement and can be handled safely, e.g. for transportation.

eyed embryo = eyed egg.

eyed hook = the usual form of hook with a round hole at the end opposite the point for tying on the line.

eyed side = the side in flatfishes bearing both eyes, the uppermost side when resting on the bottom, opposite to the blind side. Also called upper surface but not dorsal surface as it is a flank.

eyelet = the rings or guides on a fishing rod through which the line passes.

eyemouth cure = brined and lightly smoked haddock headed and split so the bone is on the right hand side.

eyestalk = a moveable, elongate peduncle bearing an eye at the tip, e.g. in the larvae of Idiacanthidae. Placodermi and Chondrichthyes have an eyestalk, a small cartilage linking the eyeball to the braincase.

## F

$F = 1$ ) the fishing mortality rate in a particular stock. It is roughly the proportion of the fishable stock that is caught in a year and is derived mathematically from relations between the number of fish alive in a stock and the number of fish caught. When  $F = 0$ , no fish are being caught from a given stock. When  $F = 0.2$  then 18% of the fish are being caught and this is almost the same as the exploitation rate and the rate best for most groundfish fisheries. At an  $F$  of 0.5, 39% of the fish are being caught and at 1.0 63%.  $F$  can exceed 1.0 though this would not be good fishery policy. See also  $F_{\max}$  and  $F_{MSY}$  below.

$F = 2$ ) Fahrenheit.

$f$  = abbreviation for effective fishing effort (fishing effort, e.g. hooks per day, adjusted or standardised, when necessary, so that each increase in the adjusted unit causes a proportional increase in instantaneous rate of fishing. Controls purported to limit effective effort imply that the fishing mortality rate is to be limited. Abbreviated as  $F/q$ ,  $F/q$  or  $f$ ).

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$f.$  = 1) abbreviation for *forma* or form (i.e. a neutral term for a single individual, phenon, or taxon; a group; or an infrasubspecific group, or in the past, a subspecies (not recommended usage)). According to the International Code of Zoological Nomenclature the use of the term "form" before 1961 is not to be interpreted as an express statement of either subspecific or infrasubspecific rank and after 1960 it is to be regarded as of infrasubspecific rank).

$f.$  = an abbreviation for *figura*, meaning figure or illustration.

(f) = female.

$F_0$  = a wild-caught fish kept in captivity; the parental generation in a breeding programme.

$F_0$  = in food inspection, an  $F$ -value (*q.v.*) where the reference temperature is 121.1°C and the  $z$ -value is 10C° and the target organism is *Clostridium botulinum*.  $F_0 = F$  ( $T_{ref} = 121^\circ\text{C}$ ,  $z = 10\text{C}^\circ$ ) = 3.0 minutes where the process results in a 12 log reduction of *Clostridium botulinum*. Also called sterilizing value.

$F/O$  = fish only.

$F_1 = 1$ ) first filial; a fish one generation away from the parental generation.

$F_1 = 2$ ) one generation removed from wild-caught fish in a breeding programme.

$F_2$  = second filial; and so on as above.

$F_{0.1}$  or  $F_{0.1}(F$  zero point one) = the fishing mortality rate at which the marginal yield-per-recruit, i.e. the increase in yield-per-recruit in weight for an increase in one unit of fishing mortality, is only 10 percent of the marginal yield-per-recruit on the unexploited stock. The fishing mortality rate at which the slope of the yield-per-recruit curve is only one-tenth the slope of the curve at its origin. It is an approximation to the level of fishing mortality that will generate the maximum sustainable yield when a more accurate estimate is not possible. Most TACs are based on this target fishing mortality which aims at catching 18 fish out of every 100. Fishing at greater than  $F_{0.1}$  yields few more fish for a much greater effort. It also gives a greater safety margin against overfishing than using  $F_{MAX}$  as it is always lower. It lets more fish survive to grow and spawn, reducing the risk of recruitment failure, increasing the stock's biomass and giving higher catch rates and so costing less to catch the same weight of fish. Fish in the catch are bigger and more economically viable on a per pound basis.  $F_{0.1}$  management is usually a more stable fishery from year to year than  $F_{MAX}$  management.

$F_1$  = the offspring resulting from a parent cross, the first generation ( $F_2$  is the second generation).

$F_{10\%}$  or  $F_{10\%}$  = the level of fishing mortality,  $F$ , at which an average female in the population will produce 10% of the eggs that would be produced by a female that was left to live out her natural life span, i.e. unfished.

$F_{30\%SPR}$  =  $F$  corresponding to a spawning stock biomass per recruit (SSB/R) which is 30% of the SSB/R obtained when  $F=0$ .

$F/q$  = abbreviation for effective fishing effort (fishing effort, e.g. hooks per day, adjusted or standardised, when necessary, so that each increase in the adjusted unit causes a proportional increase in instantaneous rate of fishing. Controls purported to limit effective effort imply that the fishing mortality rate is to be limited. Abbreviated as  $F/q$  or  $f$ ).

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F-ratio = the ratio of fishing mortality on the oldest age group to the fishing mortality of the preceding age group. Annual F-ratios are estimable parameters in many tuned virtual population analysis assessments.

F-value = in food inspection, the total lethal effect of heat applied; the time/temperature process at the cold spot of the product. The value is expressed as equivalent minutes at a specific reference temperature (Tref) and a specific z-value, e.g.  $F$  (Tref = 65°C, z = 6.7 C°) = 5.9 minutes. Also called the accumulated lethality.

faarlin = farlin.

fabrication = some fish species have been named but are based on fabricated specimens, comprising parts of more than one fish species. See also hoax where the Code comes into play; whether it does in the case of fabricated specimens is unclear (Eschmeyer, 1998).

face = 1) a bone surface.

face = 2) the fleshy part of a cod's head, eaten as a delicacy in Newfoundland.

face = 3) the inner or split side of a dried and salted cod.

face appearance = a commercial measure of fish flesh surface ranging from smooth faced to very rough faced. Flakiness, flesh separation, roughness and evenness are assessed.

face view = side view along the odd-numbered cleavage planes during the cleavage or blastula periods.

facet = an articulating bone surface, either flat or slightly curved.

facial = pertaining to the face.

facial lobe = tuberculum impar (the lateral middle walls of the fourth ventricle of the brain, each expanded as two lobes and meeting in the midline to separate the ventricle into posterior and anterior halves). Associated with cranial nerve VII.

facial nerve = cranial nerve VII. In fishes, motor to muscles of hyoid arch (hyomandibular); sensory to geniculate ganglion, sensory to taste bud system; sensory to lateral line organs of snout. See cranial nerves.

facies (plural facies) = face, a bone surface.

facsimile = an exact copy of a work, usually in taxonomy, by photography or scanning. The date of publication is the same as the original for nomenclatural purposes.

factory = a building or plant with facilities for the processing of fish.

factory ship = a large stern trawler equipped with a plant for gutting, filleting, freezing and storing fish, for processing fish oil and fish meal, and sometimes canning. Catches its own fish and takes fish from other ships to process.

facultative = not limited to; not dependent on. Opposite of obligatory, e.g. *Oncorhynchus mykiss* is a facultative marine fish, being capable of entering freshwater.

facultative lecithotrophic live bearer = a reproductive guild (q.v.) where eggs are sometimes fertilised internally by accident when gonopores of otherwise oviparous fish are close together. Eggs may be retained in the female and some early development occurs there (rarely beyond cleavage). Weight decreases during embryonic development, e.g. *Rivulus marmoratus*, *Galeus polli*. See also obligate lecithotrophic live bearer.

facultative parasite = a parasite which can exist independently as well as being parasitic. Compare obligate parasite.

facultative pond = a pond about 1.0-1.5 m deep which is aerobic during the day but at night for a few hours is anaerobic.

FAD = 1) fish aggregating device.

FAD = 2) fish attracting device; variant on FAD (1).

faecal cast = a string of faeces, mucoid and gelatinous, trailing from the anus of a fish.

faeces = undigested food and processed food remains expelled from the digestive system. Also spelled feces.

fag = female fish monger.

faginism = the regular preying of adults on young of their own species. This cannibalism enables the adults to exploit a lower trophic level than it could itself, e.g. young may feed on zooplankton that is too small for adults to catch effectively and too small to sustain adults.

fagot = faggot.

faggot = a triangular stack of split and salted cod for drying in Newfoundland.

Fahrenheit = a measure of temperature used in the U.S.A. and in older literature. Abbreviated as F. The conversion is  $^{\circ}\text{F} = (^{\circ}\text{C} \times 9/5) + 32$  and  $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$ . Usually presented as  $^{\circ}\text{F}$  (or  $^{\circ}\text{C}$ ) but strictly  $3^{\circ}\text{F}$  is an actual temperature while  $3\text{F}^{\circ}$  is a range of three degrees. Water freezes at  $32^{\circ}\text{F}$  and boils at  $212^{\circ}\text{F}$ .

fail = 1) fell.

fail = 2) a cry used by a watcher of fish runs meaning to be quick and lower the net into the water (Scottish dialect).

fair maid = dried pilchard (southwest England).

fair trade fish = a system whereby a fair price is paid for fish that are caught according to the best social and environmental standards.

fairway = the navigable part of a river.

fairy sparks = phosphorescence on decaying fish, wood and other materials.

faithful friend = fiel amigo.

fake fish = 1) physical or virtual representations of fish used in aquaria, ponds or on computer screens as a low maintenance version for the real thing. Also rubber products as gag gifts for unsuccessful fishermen.

fake fish = 2) a closed apple pie, shaped like a fish, used in inland Europe where real fish were often not readily available for days designated as no meat days according to the Catholic religion.

falaj = a term for a qanat in the Arabian Peninsula (an underground water channel constructed in alluvial fan material to tap the water table and provide a constant flow of water. Mostly found in the Middle East and a habitat there for fishes. Called karez in central Asia and Afghanistan and foggara in North Africa). Plural is aflaj.

falcate = sickle shaped; long, narrow and deeply concave or curved.

falciform = curved like a scythe, long and narrow.

falciform ligament = a remnant of the ventral mesentery in the peritoneal cavity attaching the liver to the ventral body wall.

falciform process = a ridge on the choroid coat on the floor of the eyeball. A muscle attaches to the process and the lens, its contraction drawing the lens backwards. The process probably has a nutritive function. Found in most teleosts.

falculate = a shape that is curved and sharp-pointed, like a claw.

fall = the season of the year characterised by falling water temperatures and shorter photoperiods, September to November in the northern hemisphere.

fall(s) = 1) free-falling water over a cliff; falls are often a barrier to fish movement, sometimes a complete barrier or only passable to fish able to leap such as salmonids. Falls may refer to one waterfall or a series.

fall(s) = 2) a very fast whitewater cascade.

fall cure = cod lightly salted and pickled containing 45-48% moisture and prepared late in the year in Newfoundland and Gaspé. Has more moisture than the Gaspé cure and is prepared later in the year.

fall fishery = the cod fishery of Newfoundland carried out between the end of the spring and summer fishery and Christmas.

fall line = a line on a map joining waterfalls on approximately parallel rivers leaving the mountains for the plains. Often a limit to fish migration and distribution.

fall overturn = mixing of waters in a lake caused by cooling of surface waters, convection currents and wind action. Presumably an American phenomenon (see also autumn overturn). Also called fall turnover.

fall run = anadromous fish returning to spawn in the fall.

fall turnover = fall overturn.

fall-run fish = anadromous fish that return to spawn in the fall or early winter.

falldown = a tree that has fallen into the water. Also called laydown.

falling gear = cover pots and lantern nets, i.e. nets that fall on the fish from above, generally hand-operated in very shallow waters.

falling net = a cone-shaped net thrown onto the surface of the water, trapping fish as it sinks.

fallowing = 1) leaving areas used for fish production to recover for part or all of a season.

fallowing = 2) in aquaculture, cages or ponds left without fish for a period of time.

false annulus = 1) an area of slow growth that is not counted as an annulus on scales, usually due to an unseasonal lack of food, high temperatures or reduced oxygen levels. The circuli become closely packed rapidly rather than gradually.

false annulus = 2) a check ring on scales or otoliths which occurs before the first annulus and fairly close to the focus (scales) or nucleus (otoliths).

false belly = chafing gear (any materials attached to wear points on nets). Attached below the belly of a trawl. Also called rubber.

false bottom = deep scattering layer (a layer in mid-depths of the sea detected by echo sounders, which rises at night and sinks during the day. Composed of organisms, many of which have a gas filled chamber, such as certain jellyfish and fishes).

false cast = casting the fly line forward and back in the air as a means to lengthen the amount of line that extends from the rod. The purpose is dry the fly or change the path of the line.

false egg = an egg-like spot, e.g. on the anal fin of mouthbrooding Cichlidae. The male cichlid displays these spots to a female who sucks at the spots assuming them to be real eggs; the male releases sperm that fertilise the eggs in the mouth of the female. Also called egg spots or egg dummies.

false gill = pseudobranch (a small gill (a hemibranch) found on the inside of the gill cover near the base. Despite the prefix pseudo it appears to be serially homologous with the other gills).

fam. = abbreviation for family.

family = 1) a category next above subfamily and next below superfamily.

family = 2) an individual taxon of the category "family", e.g. Carangidae. The family-group is the assemblage of co-ordinate categories superfamily, family, subfamily, and tribe (and which have the endings -oidea (recommended), -idae, -inae, and -ini (recommended) which is above the genus-group in the taxonomic hierarchy. A nominal family is a named family objectively defined by its type-genus; thus the nominal family Salmonidae is always the one to which its type-genus, *Salmo*, belongs. The family-group is the highest ranking group of taxa whose names are fully regulated by the International Code of Zoological Nomenclature.

family = 3) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for sardines.

family cultivation = aquaculture designed to feed to farmer's family from a family pond, not for commercial sale.

family group = the ranks of superfamily, family, subfamily, tribe and any other rank below superfamily and above genus group.

family name = the scientific name of a taxon of family rank, ending with -idae.

family selection = an artificial selection program in which superior families (related individuals) rather than superior individuals are chosen for breeding.

fan cast = casting sequentially in an arc around the angler in order to cover the fishable area.

fancy = aquarium developed strains or varieties of fishes.

fanning = movement of the fins over an egg mass or fry to aerate them and remove sediment and to clear nest sites of debris.

far-away gear = a trawl line with lines and hooks spaced well apart.

farctate = a filled or solid structure, as opposed to one that is tubular or hollow.

faring = seeking or fishing mackerel (Norfolk dialect) or other fishes (English dialect).

farlan = farlin.

farlane = farlin.

farland = farlin.

farlen = farlin.

farlin = a herring box or trough where the fish are placed for gutting (Scottish dialect). Also spelled faarlin, farlan, farlane, farlen and farland.

farm = fish farm (an aquaculture facility).

farm dam = an Australian reservoir providing water for cattle but also sometimes stocked with fish.

farm gate price = in aquaculture, the price for a product at the production site, not taking account of any transportation or subsequent handling costs.

farm pond = a pond dug for agricultural purposes but a term also used for aquaculture and recreational fishing ponds.

faro = a rhomboid-shaped, steep-sided, continental shelf atoll.

farsakh = a Persian (Iranian) measure of distance still in use in the late twentieth century to the confusion of itinerant ichthyologists. Roughly 5.6 km or the distance traveled on foot in one hour. Will be less distance on rough terrain and depending on the vagaries of camel temperaments. Also called فرسنگ farsang.

farsang = farsakh.

fascicle = a bound part of a volume or series issued separately; a part. Often called a number in journals or serial publications.

fascis mirabilis = a set of parallel arterial and venous capillaries in the gas gland of some gas bladders that, using the countercurrent principle, increases gas tensions in the blood, and enables the gland to secrete gas into the gas bladder. Also called rete mirabile, red gland, or red body.

fast repetitive tick = a high-pitched sound caused by a stream of air bubbles expelled from the anus of herring (*Clupea pallasii*). Apparently used in communication. Abbreviated as FRT and presumably pronounced with an added "a" (<http://www.newscientist.com/news/news.jsp?id=ns99994343>, downloaded 29 November 2003). See also Ig Nobel.

fast, to come = expression used when the trawl snags an obstruction on the sea floor.

fastener = an obstruction on the sea floor that can foul and damage fishing gear.

fat = a large, box-like trough in which cod livers were placed to render oil (Newfoundland). See also vat and vate.

fath = fathom.

Father of Angling = Izaak Walton (1593-1683), author of "The Compleat Angler", first published in 1653 and the classical work on angling.

Father of Ichthyology = Peter Arctaedius (Peter Artedi)(1705-1735), whose work on ichthyology was edited by Linnaeus and incorporated into his classificatory works after Artedi drowned in an Amsterdam canal one dark night.

fathom = a measure of water depth or other nautical lengths such as cables, 1.8288 metres, 6 feet or 2 yards. Abbreviated as fath.

fattening pond = a pond where fish are grown to marketable size. Also called finishing pond.

fatty eyelid = adipose eyelid.

fatty fish = fish with fat in the body tissues, e.g. Clupeidae, Scombridae; usually more than 2% in the tissues.

fauna = the animals inhabiting a particular region, taken collectively; a faunal work (a list of the animal species in a given area, habitat or time).

Fauna = a published work describing the animals in an area; a faunal work.

faunistics = the study of all or part of the fauna of a particular region or locality.

fazeeq = light salted fish product prepared by brine curing. Also spelled fessikh (Egypt, Sudan).

F<sub>coll</sub> = the rate of fishing which, if continued, would cause the stock to collapse.

F<sub>comfie</sub> = F corresponding to the minimum of F<sub>med</sub> (*q.v.*), F<sub>MSY</sub> (*q.v.*) and F<sub>crash</sub> (*q.v.*).

F<sub>crash</sub> or F<sub>crash</sub> or F<sub>CRASH</sub> = the fishing mortality rate corresponding to an equilibrium spawner-per-recruit (SPR) equal to the inverse of the survival ratio at the origin of the stock-recruitment relationship. Used as a biological reference point. A stock exploited indefinitely at F<sub>crash</sub> is expected to collapse sooner or later due to recruitment failure, hence the term F<sub>crash</sub>. Also called F<sub>t</sub>.

FCZ = abbreviation for Fishery Conservation Zone.

feasibility fishing = fishing undertaken to test the economic viability of a new fishery.

feast of the seven fishes = an Italian tradition on Christmas Eve (La Vigilia or the vigil in Italian, commemorating the midnight birth of Jesus). The meal consists of seven seafoods including fish and other marine organisms, e.g. anchovies, sardines, dried salt cod, smelts, eels, squid, octopus, shrimp, mussels, oysters, and clams. Seafood is eaten as this relates to the Catholic tradition of abstinence, in this case from meat. The number seven may relate to the sacraments in the Catholic church.

feather = natural or artificial feathers attached to hand line gear for attracting fishes.

fecal cast = faecal cast.

feces = faeces.

fecund = prolific, capable of, or producing, many offspring.

fecundation = impregnation or fertilisation of the egg.

fecundity = egg production, fertility, the potential reproductive capacity of an organism or a population, the number of eggs produced on average by a female of a given size or age. Usually increases with age and size.

fecundity-per-recruit = the total fecundity, e.g. number of eggs, produced of a cohort (or age class) during its entire lifespan, or by a total stock in one year, divided by the number of recruits to that stock or at the origin of the cohort. Obtained from an analytical yield-per-recruit model assuming a steady state system.

fee fishery = put-and-take fishery (the placing of hatchery-raised fish in waters to be caught by fishermen for a payment).

feed (noun) = manufactured food for fish in aquaculture.

feed additive = a non-nutritive component in a feed formulation. Includes binders, stimulants, antioxidants, antimicrobials, enzymes, pigments, hormones, medicines, etc.

feed conversion efficiency = a measure of the effectiveness of a formulated fish diet expressed as the weight in kilogrammes of feed needed to produce 1 kilogramme of fish flesh in aquaculture.

feed deprivation = withholding of food in aquaculture before harvesting. Ensures feed residues are absent from the gut.

feed efficiency = wet weight gain per unit feed consumed. May be calculated as gain divided by amount of feed provided thus including an error relating to unconsumed feed waste.

feed gain ratio = in aquaculture, the quantity of feed required to produce a given weight gain; the reciprocal of feed efficiency.

feed pond = a separate pond used to produce food for fish in an aquaculture facility.

feed selection = the choice made by a fish when several feeds are offered simultaneously. Choice may be assessed visually, by examination of gut contents, triggering of self-feeders or uneaten food on the bottom of a tank.

feed the fish = clean the fish (to skin or lead on a victim as in a carnival game).

feed the fishes = 1) to be seasick.

feed the fishes = 2) murdered, whether weighted and sunk or not.

feed the fishes = 3) death by drowning.

feed utilisation = the weight increase per unit of utilised feed in aquaculture.

feeder = 1) a tributary that runs into a larger water body.

feeder = 2) in European angling a container that carries groundbait along with the rig. It is usually a small cylinder 4 cm x 2 cm with a lead strip at the base to give it some weight and it is attached by a loop of line to the rig. The feeder can be designed to drop all its contained bait at once or allow small amounts to trickle out. Those designed for maggots have holes through which the maggots exit. Also called swimfeeder.

feeder channel = a channel supplying water to any basin.

feeding chart = a table of values used as a guide for levels of feeding for fish. Parameters include fish size, temperature, vitamin levels, quantities, etc.

feeding fishery = a fishery based on fish that congregate on their food source.

feeding frenzy = 1) a group of sharks, or other predatory fish, attacking a whale body, a large fish or a school of fish.

feeding frenzy = 2) by analogy with the above, excessive media attention.

feeding fry = a young fish whose yolk sac has been absorbed and is now feeding.

feeding ground = 1) where fish feed or where food is abundant and available.

feeding ground = 2) a place where fish are fed.

feeding guild = a group of unrelated fish that feed on similar food items, e.g. benthivore, detritivore, herbivore, insectivore, omnivore, planktivore, piscivore, etc (all *q.v.*). Also called trophic guild.

feeding level = the level at which feed is offered to fish over unit time, usually the percentage of fish body weight per time. Also called feeding rate.

feeding mixture = food mixture.

feeding place = the part of the feeding ground where fish actually feed.

feeding rate = the amount of food provided over a given time interval in aquaculture.

feeding ratio = weight of food consumed divided by increase in weight over a given time.

feeding times = the time of day when a fish is most active; usually related to daylight, tides and temperature.

feeding value = the nutritive value of food used in aquaculture.

feedy fish = fish that have been feeding heavily before capture and therefore liable to belly burst, *q.v.* Used particularly for pelagic fish feeding on plankton blooms. Feedy fish are liable to spoil quickly and are not preferred for preservation of the whole fish for human consumption.

Feejee Mermaid = reputedly a mermaid caught near the Fiji Islands and exhibited in New York by a "Dr. J. Griffin", an English gentleman, and then by the showman P. T. Barnum. Griffin was a fraud perpetrated by Barnum for heightening public interest. The mermaid was a traditional art form of Asia, formed by stitching an upper ape body to a fish body. Feejee Mermaid is now used as a generic term for any fake mermaid seen in sideshows and bars, and even in an episode of the X-Files ("Humbug" in season 2, episode 20).

feet per minute = 0.5080 cm/s, 0.0167 ft/s. Abbreviated as ft/min.

feet per second = 30.48 cm/s. Abbreviated as ft/s.

feeth = a salmon net fixed on stakes and stretched into the bed of a river (Scottish dialect). Also spelled feith and fieth.

feeth net = the net of a feeth.

feeth set = the part of a river and its bank where a feeth is set.

feeth shot = the part of a river and its bank where a feeth is set.

feith net = the net of a feith.

feith set = the part of a river and its bank where a feith is set.

feith shot = the part of a river and its bank where a feith is set.

fell = casting a net from a boat in salmon fishing (Scottish dialect). Also spelled fail.

feminisation = method of direct sex reversal by the treatment of animals with doses of female hormones, e.g. oestradiol-17 $\beta$ , in the feed during the early stages of development. Drugs or genetic manipulation may also be used. Female fish are beneficial to salmonid and flatfish farmers where the females are more desirable due to the later onset of maturity.

fen = type of wetland that accumulates peat deposits. Fens are less acidic than bogs, deriving most of their water from groundwater rich in calcium and magnesium.

fence month = a closed season for fishing (archaic, more used for deer but by analogy applied to fishing too).

fence net = a net held in place by stakes, anchors, etc.

fence time = spawning time for fish (or breeding time for such animals as deer) when they cannot be caught legally.

fender = a stone weight used to sink a fishing line (Scottish dialect).

fenestra = a small aperture, especially in a bone, often used for paired openings.

feral = fish escaped from domestication and reverted to wild state but remaining distinct from other species. May infect farmed fish with diseases, interbreed with wild stocks, or dominate ecosystems.

fermented ensilage = fermentation generating organic acids that conserve the fish product.

fermented fish paste = salted, macerated fish allowed to ferment in the Far East. Spices and colourings may be added.

fermented fish sauce = fermented whole fish, processed by their own gastric enzymes and by microorganisms with salt in the Far East.

fermented flatfish with yam = a North Korean recipe, similar to traditional kimchee (*q.v.*), but more famous on a Twitter feed by an Austrian comedian who posts Korean Central News Agency reports as unintentionally funny.

ferruginous = reddish-brown, the colour of rusty iron.

ferrying = taking fish from a trawler to the fish carrier. Also known as trunking and boarding.

fertilisation = 1) fusion of the male and female reproductive cells.

fertilisation = 2) in aquaculture, the improvement of water productivity by addition of natural or artificial compounds.

fessikh = fazeeq.

Fextinction or  $F_{\text{extinction}}$  or  $F_{\text{EXTINCTION}}$  = Fcrash.

ff. = abbreviation for folios following, after a page number reference indicating the following pages are relevant.

fh = a French measure of water hardness, 10.0 p.p.m. calcium carbonate.

$F_{\text{high}}$  or  $F_{\text{HIGH}}$  = F corresponding to a spawning stock biomass per recruit (equal to the inverse of the 90% percentile of the observed R/SSB). A level of F where recruitment has not been sufficient to balance the mortality in about 9 years of 10. Exploitation at this level is therefore likely to result in a decrease in the stock.

fibre FISH = a laboratory technique in which fluorescence in situ hybridisation (FISH) is done on chromosomes that have been mechanically stretched.

fibred cod = shredded cod (small pickle cured cod reduced to small dried fibres in a machine. Drying is at 65.5°C. Also called flaked cod).

fibres of Sharpey = fibres in scales of Brachiopterygii and Lepisosteidae.

fibrillary plate = the fibrous lamella or disk forming the base of a teleost scale.

fibrocartilage = cartilage containing collagen fibres, e.g. the ventral intermandibular tendon of the cownose ray (*Rhinoptera bonasus*) makes a sharp turn as it passes dorsally around the corner of the jaws and there is a fibrocartilaginous pad associated with the tendon along the inner edge of this sharp bend.

fictional fish = see named fish and the category "fictional fish" in Wikipedia.

fiddle = a plastic or wooden braiding needle used in mending fish nets.

*fide* = on the authority of, according to, with reference to a publication or to a cited published statement. From the Latin, by faith.

fiel amigo = the Portuguese nickname for salt cod, meaning faithful friend, as it was a mainstay of the diet.

field = 1) one of the four sectors of a scale, namely anterior (basal or imbedded), posterior (apical or exposed) and the two lateral fields (the upper and lower sectors).

field = 2) the smallest unit of data in a database.

field = 3) a general term for the place where fish are captured, as in "field work", "field research", despite the fact that few fishes are caught in fields.

field = 4) in taxonomy, a taxon or a set of taxa.

field catalogue = list of specimens prepared by the person capturing the fish and including location, date of capture, method of capture, etc. May be supplemented by a field journal.

field character = a character easily observed under natural conditions, e.g. an identification character detectable on fish in the hand or in the water.

field guide = a pocket-size book or a CD containing keys for identification, illustrations and/or photographs of the fish, distribution maps and some life history notes. Used to identify fish captured during field work either in the field or later in the laboratory.

field identification = the determination of the taxonomic identity of an individual specimen, under field conditions, often with the aid of keys.

field journal = a book with blank pages to contain field notes. May be stored directly in a handheld or laptop computer without going through a paper stage. However working with fish often involves wet or slimy hands and pencil and paper are still useful.

field notes = observations in a journal format on collections made, their habitat and locality, field conditions, colour in life, etc. recorded when the collections were made.

field number = one of a series of sequential numbers given to a specimen or collection in the field that links it with documentation. Catalogue numbers can only be assigned in the museum as other collections may be being made simultaneously. The field number is written on a field tag with the specimen or placed in the jar if there are many specimens and is also recorded in field notes and field catalogues.

field research = study of fishes in their natural habitat.

field tag = a label attached to specimens or in a collection jar or bag, marked with a field number or even full collection data (as opposed to a museum label with subsequent identification of specimens and formally worked out locality data).

field work = study and/or capture of fishes in their natural habitat.

*fig.* = abbreviation of *figura*, meaning figure or illustration.

*figura* = figure or illustration. Abbreviated as *f.*

fighting belt = a belt strapped to the waist to aid in long fights with a fish. It has a padded oval shape surface to be rested on the abdomen and with a cylindrical holder in the middle for the rod butt to rest it. Most come with a metal shaft at the end of the cylindrical holder for the rod that has a gimbal butt. This avoids the rod from turning around and will only allow a vertical movement.

[fighting chair](#) = a chair bolted to the deck of a boat, having a foot rest, a gimbaled socket for the rod but and a harness attached to the rod. It allows a fisherman to use back and leg muscles to fight a large marine fish, dropping the rod from vertical to horizontal with a swift reel of slack gained. Also called fishing chair.

fighting colour =a colour pattern that develops when fish, usually male, defend a territory.

fighting fish = a member of the labyrinth fish genus *Betta* (Osphronemidae), the males of which that engages in ritualistic reproductive fights.

*figura* = figure or illustration. Abbreviated as *f.*

figure = in printed works a graph, diagram or illustration.

figure eight knot = a knot used in angling for attaching leaders, traces and other terminal tackle to a line. Easy to tie and to interchange tackle. Various websites have animated steps showing how to tie this knot.

figure-type = in taxonomy, an original figure or illustration of a specimen; an iconotype, *q.v.*

figured specimen = figure-type.

Fiji Mermaid = Feejee Mermaid.

[fila](#) = a thread-like structure, a filament. *Eleotrioides helsdingeni* is provided with two caudal fila - caudal rays prolonged beyond the rest of the fin while *Sturisoma aureum* has one.

filament = 1) fishing line comprised of single or multiple strands.

filament = 2) fila.

filamentous = with a thread-like projection.

filch = 1) a rod, line and hook used to steal goods from a vendor's stall.

filch = 2) from the above, to steal furtively, snatch.

[file](#) = fish teeth arranged in the labio-lingual direction, e.g. in sharks. Such teeth are at different developmental stages and are derived from the same tooth bud position, *cf.* row, diagonal file and tooth row.

filet = fillet in French.

Filet-O-Fish = a MacDonald's fish sandwich introduced in 1963 to combat declining sales on Fridays, a non-meat eating day for certain Christians. Also popular with Muslims who cannot eat haram meat. Also called FishMac or McFish.

filial = the generation or sequence of generations following the parental generation. See F0, F1, etc. above.

filial cannibalism = cannibalism of kin.

filiform = round and very slender; cord-like; in the form of a thread or filament, e.g. first dorsal ray in *Chauliodus* (Chauliodontidae), a branchiostegal ray.

fill = to wind twine on the implement used to knit a fish net (Newfoundland).

fillet = a slice of fish flesh cut out parallel to the vertebral axis for human consumption, with or without skin attached. Usually 2-12 oz in weight for restaurant and home use.

filter feeder = a fish that obtains small particles of food (plankton) by filtering them out of the water, usually with numerous, elongate and fine gill rakers, e.g. megamouth shark.

filtering mat = a grating screen of fish screen (2) (*q.v.*) built on a slant into a river bed. Fences or netting direct fish onto the screen and the fish run aground on it while the water falls through the screen grating.

filum terminale = terminal threads of the spinal cord which extend to the end of the vertebral canal.

fimbria (plural fimbriae) = 1) a fringe or fringe-like structure.

fimbria = 2) plural of fimbrium.

fimbriae = plural of fimbria (1).

fimbriate = fringed; with thread-like filaments, e.g. margin of sucking disk of lampreys (Petromyzontiformes).

fimbrillate = having a small or fine fringe.

fimbrium (plural fimbria) = a short pilus or hair-like structure on the surface of a cell; used to attach to surfaces and in conjugation with another cell of the same species. Since its plural is identical with the singular for fimbria, meaning fringe, some confusion may arise.

fin = 1) flap-like external organ concerned with locomotion in fishes. See dorsal, adipose, caudal, anal, pelvic (ventral), and pectoral fins.

fin = 2) an arm or hand (slang). See also tip the fin.

fin = 3) in America a \$5 bill, from the Yiddish finnif, a £5 note in England in the nineteenth century. From the German funf or five.

fin = 4) the verb for the process known as finning.

fin clip = the part removed and the removal of specific parts of specific fins in a coded sequence to mark individual fish for mark-recapture and other similar studies. Also called fin clipping.

fin clipping = fin clip.

fin element = a fin ray, spine or pterygiophore.

fin erosion = fin rot.

fin formula = in old works the dorsal, ventral, and anal fin counts were each presented as a formula with the spine count the numerator above the ray count, e.g. D. 20 /14-15 means 20 spines and 14 to 15 rays in the fin.

fin height = length of the longest ray in the fin.

fin membrane = the thin membrane between and connecting fin rays and spines.

fin nipping = biting of fins among cultured fish through overcrowding or insufficient funds.

fin ray chamber = one of the compartments in the median fin fold (dorsal and ventral fin folds) into which project so-called fin rays in Amphioxo.

fin ray counts = see the fin concerned; see also fin formula.

fin rot = disintegration of fish fins through bacterial infections in nature, aquaria or aquaculture, aggravated by crowding and nutritional problems in aquaculture tanks. Common in aquarium fish like mollys, especially those with dark pigment such as black mollys. The bacteria involved are *Aeromonas*, *Pseudomonas* and *Flexibacter*. Death may occur if it progresses too far but bathing in a salt solution, various proprietary medications and application of topical medications will prevent further development. Also called fin erosion.

fin web = 1) the fin membrane.

fin web = 2) the compressed part of the shark fin, distal to the base and supported only by ceratotrichia (q.v.) , the aplesodic fin (q.v.), or by ceratotrichia surrounding expanded fin radials or by radials only, the plesodic fin (q.v.).

fin-clipping = the parasitic or predatory action of one species on another where sections of fin are removed as food, e.g. by *Serrasalmus*.

Finagle's 2nd Law = states, if something can go wrong it will. There are no 1st or 3rd laws. Also known as Murphy's Law.

final host = definitive host (the fish in which a parasite passes its adult or reproductive phase. Also called primary host).

find fish on one's fingers = to devise or allege an excuse (late 16th to early 17 centuries).

finder = 1) a sonar device or echo sounder used to locate fishes and determine water depth.

finder = 2) a surf-fishing rig comprising a pyramid-shaped sinker running freely along the line; this allows the bait to be carried by the tide or run by a fish.

Findon haddock = finnan haddie.

fine kettle of fish = a bad state of affairs; a very difficult and annoying situation; something to be considered or reckoned with. Derived from kiddle or keddle, *q.v.*, a basket set in the sluice of a dam or weir to catch fish. Kiddles were used by royal officials but were often destroyed by poachers, hence a bad state of affairs.

fine-meshed = pertaining to a fish net having small meshes.

finesse fishing = an angling technique using light tackle, effective in clear, unvegetated water.

finfish = true fishes, those poikilothermic vertebrates breathing by gills throughout life and having limbs, if any, in the form of fins. Used to indicate true fishes in the context where the word fish is applied in its broad sense to cover aquatic animals such as whales, crustaceans and molluscs.

finfish excluder device = a structure used on fishing equipment to reduce the amount of by-catch taken. Commonly used with shrimp trawls.

finfold = the median and metapleural folds in the integument of Amphiox. Also the median integumentary fold of embryos of other fishes. Also a hypothetical fold from which paired fins were supposedly evolved from folds of the body wall.

finger = fish stick (fish marketed in the form of rectangular sticks cut from a block of frozen fish fillets, breaded, fried in fat or sold frozen for cooking. Usually 1-3 oz in weight).

finger pier = a narrow floating pier leading off from a pier or wharf.

fingerling = an immature fish, less than one year old, or any fish too small to be of marketable size (and so up to 25 cm long).

fingerling pond = a rearing pond stocked with fry for their first year of growth. Also called second fry rearing pond.

fining compound = a type of isinglass (glutinous fluid prepared from the gas bladders of fish) used to clarify beer.

finishing pond = fattening pond.

finlet = one of a series of small fins consisting of a few rays each, separate from each other and found posterior to the dorsal and anal fins, e.g. in Scombridae.

Finn men = sea fairies in the Orkneys who drive away fish from the part of the sea they inhabit.

finnack = finnock.

finnage = the whole set of fins found on a fish.

finnan haddie = split, lightly salted and cold smoked (for a few hours) haddock, without head and guts, from Scotland. Cooked in butter or cream traditionally. Also called finnan haddock. Reputedly named for the village of Findon in Scotland.

finnan haddock = finnan haddie.

finneck = finock.

finner = a generic term for any fish (Scottish dialect).

finnie = a salmon under one year (Scottish dialect).

finning = removal of the fins and discarding of the carcass, e.g. with sharks as the source for Chinese shark fin soup. A single large fin from a basking shark can sell for \$13,300 in Asia (in 2003).

finnoch = finnock.

finnock = immature sea trout, *Salmo trutta* (Scottish dialect). Also spelled finnack, finneck, finnoch, phinnick and phinnock.

finny prey = a synonym for fish.

finny tribe = a synonym for fish.

finrot = in aquarium fish caused by poor environmental conditions, stress and high bacterial levels; initially appearing as red streaks in the fins, followed by fraying, rotting of fins and when reaching the body, death. Salt baths and application of Gentian violet can cure the condition if the causes are removed.

fion = a unit of disapproval.

fiord = a long, deep, narrow inlet of the sea between steep mountainous sides. Of glacial origin. Also spelled fjord.

fire fishing = attracting or sighting fish by means of light, in this case by a fire. Voyageurs used to build a platform on the bow of a canoe to hold the burning materials. Also called torch fishing.

firmness = a means of assessing the quality of fish by finger pressure when raw or in the mouth when cooked.

first feeding larva = a larval fish that has used up all, or almost all, of its yolk and is capable of feeding.

first fry pond = nursery pond (a pond system intermediate between the hatchery and grow-out stages in aquaculture).

first rearing pond = nursery pond (a pond system intermediate between the hatchery and grow-out stages in aquaculture).

first reviser = the person who first selects one of two or more simultaneously published names that (s)he believes represent the same taxon, or who selects which one of two or more taxa for which identical names have been simultaneously published, the name will apply to. This is done in the interest of nomenclatural stability.

first species method = in nomenclature, the automatic selection of the first named species as the type of the name of a genus. Not now an accepted means of typification.

first uroneural = caudal bony plate (any ossified plate helping to support the tail fin. A name given to the first larger pair of uroneurals, situated on the curve of the upturned posterior end of the vertebral column. Preferably called first uroneural).

first-level consumer = a fish that feeds on the lowest level of a community's food web, namely plants. Also called primary consumer.

firth = a long, narrow indentation of the coastline.

Fischfrikadellen = cod, coalfish or other white fish made into rissoles by mixing with binding materials and spices, then roasted, fried or hot-smoked, after cooling. Also packed in cans or glass jars usually with vinegar and spices (Germany). Marketed as semi-preserves or canned. Also called Brisoletten.

Fischsülze = cooked fish, minced and mixed with cucumbers, onion, spices and other ingredients, packed in jelly, and dissolved by heat. This German product is similar to corned beef. The minimum fish content is 60%.

fish = 1) any chordate below the tetrapods. A poikilothermic aquatic chordate breathing by means of gills throughout life (accessory organs may be used) and having limbs, if any, in the form of fins. For convenience, lancelets, lampreys and hagfishes are considered fishes along with sharks, rays, chimaeras and bony fishes. The word fish has been used in popular English for almost a thousand years (A.D. 1010). Where one species of fish is involved the plural is fish, where several species of fish are involved the plural is fishes. This practice is not always strictly adhered to. Fish is also used in a broad sense of aquatic animals, both vertebrate and invertebrate, particularly those which are fished for, such as whales and molluscs, as well as ordinary fishes (see below). To distinguish the true fishes in this context the term finfish is used.

fish- = many words have been combined with fish as a prefix or modifier. These words may, or may not, be hyphenated or joined. Often, but not always, the hyphenated word is an adjective; but frequently this is mis-used. All variants may need to be searched although most are entered here. Note that any term preceded by fish may occur alone, e.g. fish garth may appear simply as garth.

-fish = many words have been combined with fish as a suffix. These words may, or may not, be hyphenated or joined and can be found under the appropriate letter heading.

The word fish is found in all languages and some examples follow (not all scripts translate across platforms):-

Abenaki = *namas*, Afrikaans = *vis*, Ainu = *ceh*, *cep*, Aklanon = *isda*, Alabama = *tafo*, Albanian = *peshk*, Anglo-Saxon = *fisc*, Arabic = سُك (samak), Aramaic = نُون (nun), Armenian = ձուկ (towk) or *tsoug*, Assyrian = *nooynaa*, Asturian = *pexe*, Avestan = *masyô*, Ayapathu = *nga'a*, Aymara = *chawlla*, Azeri = *baliq*, Basque = *arrayn*, Bavarian = *fiisch*, Bemba = *isabi*, Bengali = *machh*, Bergamasco = *pès*, Blackfoot = *mamíí*, Bolognese = *pass*, Bosnian = *riba*; Brazilian = *peixe*, fish, Breton = *pesk*, Bulgarian = *риба* (ryba), Byelorussian = *рыба*, Calabrese = *pisciu*, *pisci*, Caló = *maché*, *machó*, Cambodian (Khmer) = *t'ray*, Cantonese = 魚 (yue), Catalan = *peix*, Catawba = *yie`*, Cebuano = *isda*, Chamorro = *guihan*, Chechen = *ch'cara*, Cherokee = *a tsa di*, Cheyenne = *noma'ne*, Cornish = *pisk*, Croatian = *riba*, Czech = *ryba*, Dagespregos = *peisko*, Danish = *fisk*, Dutch = *vis*, Dzoratâi = *pesson*, Esperanto = *fišo*, Estonian = *kala*, Faeroese = *fishkur*, Farsi = ماهی (mahi), Finnish = *kala*, Fijian = *ika*, Flemish = *vis*, French = *poisson*, Frisian = *fisk*, Fulani = *liingu*, Galician = *peixe*, Gan = 魚 (enlei), Georgian = თევზი (tevzi), German = *Fisch*, Greek = ιχθύς (ichthos, ancient), ψάρι (psari, modern), Griko Salentino = *atzàri*, Guarani = *pira*, *ipirã*, Gujarati = માટ્લા (macchi), Hainanese = 鱼 (hu), Haitian creole = *pwason*, Hakka = 魚 (ng), Hausa = *kifi*, Hawaiian = *i'a*, Hebrew = גָּד (dag), Hindi = मछली (machali), Hmong = *ntsəs*, Hungarian = *hal*, Huron (Wyandot) = *ye,ent,so*, Ibo = *azu*, Icelandic = *fishkur*, Ido = *fisho*, Ilocano = *lames*, Indonesian = *ikan*, Interlingua = *pisce*, Inuktituk = *iqaluk*, Inupiaq = *iqaluk*, Irish = *iasc*, Italian = *pesce*, Japanese = 魚 (さかな) (sakana), Javanese = *iwak*, Judeo-Spanish = *peshe*, *peshkado*, Kankonian = *tairak*, Khmer = *t'ray*, Kongo = *mbizi amaza*, *mbizi a maza*, Konkani = *nishtem*, Korean = 물고기 (seng-son), Kunza = *cacchi*, Kurdish Kurmanji = *masî*, Kurdish Sorani = ماسی (masi), Ladino = *pesc*, Lao = ປາ (bpa), Lappish/Saame = *guöllé*, Latin = *piscis*, Latvish = *fisribe*, fisdogim, Leonese = *peixe*, Limburgian = *vësj*, *vösj*, Lingala = *mbisi*, Lithuanian = žuvis, Loglan = *fici*, Lombardo Occidentale = *pès*, Luxembourgish = *Fësch*, Maasai = *osinkirri*, Macedonian РИБА (ryba), Mahratta = *māsolī*, Malagasy = *haza*, trondro, Malay = *ikan*, Maliseeet-Passamaquoddy = *nûm-es'*, Maltese = *huta*, Mandarin = 魚 (Pīnyīn: yú), Mantuan = *pes*, Manx = *eeast*, Maori = *ika*, *ngobi*, Mapunzugun = *chajwa*, Marathi = मासळी ( ? ), Marshallese = *ik*, Mayan = *kay*, Mikmaq = *nméj*, Mongolian = загас (zagas), Mudnés = *pass*, Nahuatl = *michin*, Neapolitan = *pesce*, Norwegian = *fish*, Novial = *fishe*, Occitan = *peisson*, Old Tamil = *min*, Papago = *watopi*, Papiamen = *piska*, Parmigiano = *pess*, Pashtu = *kab*, Piemontese = *pess*, Pig latin = *ishfay*, Polish = *ryba*, Portuguese = *peixe*, Potawatomi = *gigos*, Provencal = *peis*, Pugliese = *pesc*, Punjabi = ਮਛੀ ( machi ), Quechua = *suchi*, *chaulla*, Rapanui = *ika*, *ma'ito*, Reggiano = *pèss*, Romagnola = *pès*, Romanian = *pește*, Romansh = *pesch*, Romany = macshò, Ruanda = *ifi*, Russian = *рыба* (r'yba), Saanich = *pis*, Samoan = *i'a*, Sanskrit = मत्स्य (matsya), Sardinian (Limba Sarda Unificada) = *pische*, Sardinian Campidanese = *piscau*, *pisci*, Sardu = *písche*, Scots Gaelic =

iasg, Seneca (Mingo) = kätsö, Sepedi = hiapi, Serbo-Croatian = riba, Shona = hove, Sicilian = pisci, Sinhalese = ma-lu, Slovak = ryba, Slovene = ribe, Somali = kalluun, Spanish = pez, plural peces, pescado, plural pescados, Sranan = fisi, Sumerian = kua, Sundanese = lauk, ikan, Swahili = samaki, Swazi = ín-hlanti, Swedish = fisk, Swiss German = Fisch, Tagalog = isda, Tahitian = i'a, Telegu = kakka, Thai = ພາ (plaa), Tibetan = ལྔ (ña), Tok Pisin = pis, Triestino = pesse, Tupinambá = pirá, Turkish = balık, Turkmen = balyk, Ukrainian = риба (ryba), Urdu = مچھلی (machhli), Valencian = peix, Venetian = pesse, Vietnamese = cá, Vogul = xul, Wallon = pexhon, Welsh = pysgodyn, Yiddish = fish, Yucatec = kay, Zeneize = pescio, Zulu = inhlanzi.

fish = 2) a whale; used in the historical whale fisheries.

fish = 3) slang for microfiche; a cabinet of microfiches is called a fish tank.

fish = 4) the flesh of fish used as food.

fish = 5) a gullible person.

fish = 6) a card game.

fish = 7) a counter or marker at cards, often fish-shaped.

fish = 8) pieces cut out of garments to make them fit closely.

fish = 9) a piece of timber used to strengthen a mast or spar when sprung, often somewhat fish-shaped.

fish = 10) a machine for hoisting the flukes of the anchor to the bow.

fish = 11) a prostitute; probably from the resemblance of the word to flesh.

fish = 12) a corpse, especially one taken from water.

fish = 13) to splice as rails, with a fish-joint.

fish = 14) to seek to obtain by artifice, in a sly or indirect way, e.g. fish for compliments.

fish = 15) to search for loot.

fish = 16) slang for a torpedo; in full tin fish.

fish = 17) slang for a new prisoner.

fish = 18) a dance done to fox trot music in 4/4 time.

fish = 19) to pull or draw out (as out of a pocket or out of boiling water, or wires in walls).

fish = 20) a person deficient in some way (a poor fish, a queer fish).

fish = 21) the twelfth sign of the zodiac (about 19 February to 20 March).

Fish = 22) a surname.

fish = 23) a type of wide surfboard with a swallow tail.

FISH = 24) abbreviation for fluorescence in situ hybridisation, the use of fluorescent tags to detect hybridisation of probes with metaphase chromosomes and with the less-condensed somatic interphase chromatin.

FISH = 25) First In, Still Here, a facetious extension of FIFO (first in, first out) used in accounting.

FISH = 26) Friends in Service Here, a service agency assisting the low income, elderly or handicapped.

fish = 27) a bad poker player.

fish = 28) Atlantic cod, *Gadus morhua*, once such a mainstay of the economy and life in Atlantic Canada that it was referred to simply as fish. See also 79 below.

fish = 29) slang for a dollar.

fish = 30) meat having the qualities of fish, e.g. a beaver tail is fish but an otter tail is flesh or meat.

fish = 31) applied figuratively to a person whom it is desirable to catch or hook.

fish = 32) the first incarnation of Vishnu in Hindu mythology.

fish = 33) to lead an internal halyard or messenger through a mast.

fish = 34) an attractive male human; a hot guy.

fish = 35) surreal or random. From the joke "How many surrealists does it take to change a light bulb?" "How many?" "Fish".

fish = 36) life mate; from the proverb "there are more fish in the sea".

fish = 37) used as an exclamation of anger to replace potentially offensive words; presumably from "By God's flesh".

fish = 38) freshman.

fish = 39) novice, beginner.

fish = 40) newcomer.

fish = 41) foreigner.

fish = 42) as a verb, to catch fishes, marine mammals, and invertebrates; the act of fishing.

fish = 43) <>< - as an e-mail symbol.

fish = 44) ghoti (pronounced as fish; an indication of the complexity and inconsistency of the English language attributed to George Bernard Shaw - gh as in cough, o as in women and ti as in nation means ghoti can be pronounced as fish (and other words have been cited such as trough, rough, laugh, station, etc., the original has not been tracked down)).

fish = 45) according to the *Fisheries Act* in Canada, fish includes fish, shellfish, crustaceans, marine animals and any parts of fish, shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals.

fish = 46) a turtle in the West Indies, so called by dealers in the capture of them in the past.

fish = 47) a submarine.

fish = 48) a victim that someone is trying to catch or hook, e.g. in a carnival game. See clean the fish.

fish = 49) a person (poor fish, queer fish, cold fish, loose fish, etc.).

fish = 50) an acronym for Fibonacci shrinking, a software cipher.

fish = 51) British code name for German teleprinter ciphers in the Second World War. From Fibonacci shrinking. See also tunny and sturgeon.

fish = 52) stage name for Derek William Dick, a Scottish rock singer, writer and actor.

fish = 53) to search for something under water by dredging, diving or some other method.

fish = 54) to draw or pull out of water.

fish = 55) to curry favour or ingratiate oneself.

fish = 56) to use as bait in fishing.

fish = 57) to search for something.

fish = 58) to cover land with fish remains as a fertiliser.

fish = 59) to provide good or bad sport for anglers, e.g. the river continues to fish badly.

fish = 60) to make use of for fishing, such as a small boat or gear, e.g. this rod is easier to fish.

fish = 61) to take part in a fishing competition, e.g. members of the club will fish a match tomorrow.

fish = 62) the act of attaching a piece of timber used to strengthen a mast or spar when sprung.

fish = 63) the act of joining with a fish joint.

fish = 64) a flat plate of iron or wood set across a joint to strengthen it, as in railway construction; a fish plate, *q.v.*

fish = 65) a yellow, oilskin raincoat or slicker. So-named because of a trademark.

fish = 66) a seaman. See also scaly fish.

fish = 67) a woman; probably from the resemblance of the word to flesh.

fish = 68) a heterosexual female in homosexual slang in the twentieth century.

Fish = 69) the Australian train between Sydney and Blue Mountain communities. Apparently several of the first crew had names related to fish.

fish = 70) female pudenda (slang).

fish = 71) the penis (slang).

fish = 72) a Roman Catholic, in a derogatory sense since they ate fish every Friday for religious reasons. See also fish-eater.

FISH = 73) an array programming language.

FISH = 74) files transferred over shell protocol is a protocol to transfer files between computers and manage remote files.

fish = 75) a UNIX command shell, being an acronym for friendly interactive shell.

FISH = 76) an unofficial acronym for urban warfare, meaning fighting in someone's house.

fish = 77) American English slang for an African American.

fish = 78) to crib or copy someone else's work.

fish = 79) used for salmon and sea trout in Scotland as these are important fish See also 28 above.

fish a man appeal = a contribution to the Second World War effort by Newfoundland fishermen who donated one salt-dried cod, the proceeds from the sale of which went to provide comforts for Newfoundland servicemen overseas and their families at home.

fish advisory = not addressed to fish but to the public when high concentrations of chemical contaminants have been found in local fish.

fish aggregating device = artificial or natural floating objects placed on the ocean surface, anchored to the bottom or drifting, to attract several schooling fish species underneath, thus

increasing their catchability. Used with tuna, for example. Also called fish attracting device. Abbreviated as FAD.

fish allergy = humans can be allergic to fish (BWC, personal experience) although not to other seafoods such as crustaceans and molluscs. *Gadus morhua* allergy has been studied the most and other species are believed to be similar although not all fish species may trigger a reaction. Gad c I, a parvalbumin, is the major cod allergen. Symptoms appear within minutes to a few hours of eating fish and include swelling of the lips, tongue or throat, hoarseness, cough, hives, rashes, runny nose and watering eyes, and asthma. Potentially fatal if the throat constricts. Symptoms may be limited to nausea, vomiting or cramping diarrhea.

fish and brewis = salt cod and hard bread (orhardtack) soaked in water overnight and then fried and garnished with salt pork and molasses in Newfoundland. Brewis is Middle English for bread soaked in drippings.

fish and chips = fried fish and fried chipped potatoes. See also grockle fodder.

fish and chip shop = a shop selling fish and chips. Note that the fish is often dogfish (*Squalus acanthias*) and better types of fish, such as cod and haddock, cost extra.

fish and chip van = a vehicle which is used to sell fish and chips from; often not particularly mobile as a licensed spot on a street is where the vehicle is stationed or it may be converted and permanently fixed in a location.

fish and chips = 1) battered fish served with sliced potatoes cooked in oil or fat. A staple of the English, better than it sounds.

fish and chips = 2) also, elliptically, for a shop where this item may be bought.

fish and flesh = a proverb, you must not make fish of one and flesh of the other, meaning you must treat both alike. Fish is deemed an inferior sort of animal food to flesh. Used for its alliterative quality.

fish and scrunchions = Dutch mess (salt cod and potatoes with browned onions. Garnished with scrunchions (the crunchy bits remaining after pork fat is rendered). Also called house bankin' or hugger-in-buff).

fish and shrimp = pimp (U.S. rhyming slang).

fish and vang = cod and salty and fat pork chunks cooked together (Newfoundland).

fish 'n' taters = laters (Cockney slang for seeing someone later).

fish apartment house = a Japanese fish shelter comprising a concrete block about a metre cube with a 30 cm window on each side wall. About a 100 of these are deposited in a suitable area where they attract fish that can be caught by angling, longlines and bottom gill nets set nearby.

fish attracting device = fish aggregating device.

fish attractor = any structure placed in the water to create habitat for fishes.

fish au naturel = a canned product prepared by cooking fish in its own juice (United Kingdom) or light brine, sometimes with vinegar and flavouring agents added (France).

fish avoidance = various cultures do not eat fish, e.g. ancient Syrians believed fish to be holy and did not eat them (see Atargatis); the Bechuana and certain Bantu tribes in Africa. Often associated with social status among pastoralists, only lower class groups consuming fish, or with religion such as the Hindu belief in non-violence to sentient beings and the resulting vegetarianism. Also, certain bodies of water are sacred and fish from there are not eaten.

fish bagger = a suburban tradesman's term for those who live in good areas but without spending more than rent money; derisory.

fish ball = fish don't have balls but are sometimes made into them. A ball of shredded white fish or cod and mashed potatoes, flour or other binding material, usually fried. Also called fish dumpling. See also canned fish ball, catfish ball and ball.

fish bar = 1) fish plate (1).

fish bar = 2) a restaurant serving fish, often sushi, with seats at a bar.

fish barrel = a rounded wooden container used to pack fish. A barrel of fish can be 200 pounds or 90.72 kg in the U.S.A. while a barrel of herrings used to be 32 pounds or 14.51 kg in England.

fish barrier = weir (nets or fences set in streams or along the coast to direct fish into a holding container for easy capture. Some weirs take advantage of the falling tide to capture fish while others catch upstream migrating adults).

fish barrow = a flat, rectangular wooden frame with handles at each corner, made for two men to carry cod.

fish basil = a herb, basil used in fish dishes.

fish basket = 1) a device to catch fish moving in a stream; made of wickerwork or wooden slats and usually trapping downstream migrants.

fish basket = 2) keepnet (a net lacking knots and supported with plastic or metal hoops, designed to hold fish caught by angling, usually in contests so the fish can later be weighed and released, or to keep fish fresh before transport and eating).

fish basket = 3) a basket used for carrying fish; a creel.

fish bat = fishing bat.

fish beach = an area of beach levelled for drying of salt cod (Newfoundland).

fish beam = 1) a beam one of whose sides (usually the ventral one) swells out like the belly of a fish.

fish beam = 2) a scale for weighing dried cod (Newfoundland).

fish bed = a stratum rich in fish fossils.

fish bee = a bluebottle fly (Scottish dialect).

fish beetle = the rove beetle (*Staphylinus villosus*) which swarmed in older fish processing sheds. Also called fish fly.

fish before the net = to be premature in anticipating something.

fish begonia = an ornamental Brazilian plant (*Begonia maculata*) with fishtail-shaped, spotty leaves.

fish belly = anything white like a fish belly including certain plants where leaves are white on the underside and turned up in the wind.

fish belly sill = a side or central sill used in railroad car construction; named for its fish shape.

fish berry = a plant used to kill or stupefy fish when placed in water as an extract, e.g. Levant berry (*Cocculus indicus* (an older name) or *Anamirta paniculata*) crushed and scattered on the water surface by Indian fisherman.

fish bird = the Atlantic black-legged kittiwake or the northern common tern, birds whose appearance heralded the beginning of the fishery in Newfoundland.

fish biscuit = 1) a large, fish-flavoured treat used for rewarding animals in zoos such as bears.

fish biscuit = 2) a term for any reward that does not meet expectations. Based on the TV series "Lost" where one of the characters (Sawyer) spent most of an episode locked up and trying to solve a puzzle only to be rewarded with a fish-shaped biscuit.

fish bladder = 1) the storage sac for urine.

fish bladder = 2) a figure composed of two equal and symmetrically placed circular arcs. See also vesica piscis.

fish bladder = 3) gas bladder (a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, sound receptor, respiratory organ. Often lacking in bottom fishes. Sometimes called swim bladder or air bladder, less appropriate terms).

fish blanket = hornwort (*Ceratophyllum demersum*), an aquatic, perennial plant with whorled leaves.

fish block = 1) a block of frozen fish flesh, containing no skin and no bones.

fish block = 2) equipment to raise the flukes of an anchor to the gunwale. Also called fish tackle.

fish block = 3) a mechanism used with fish-tackle for raising heavy objects. Consists of a wheel with a groove in which a rope can run to change the direction or point of application of a force applied to the rope.

fish board = a wooden platform used as a table on Newfoundland fishing boats. Cod, salt meat and potatoes were cooked in a pot and thrown on the fish board. Each fisherman took a seat around the board and ate away until it was all finished.

fish boat = a boat from which fish are caught.

fish boil = 1) a mass of fish attacking food or bait just below the surface. Also called boiling school.

fish boil = 2) fish, potatoes and onions boiled in salted water, usually at a picnic.

fish boil = 3) a skin eruption found on fishermen in prolonged contact with salt water.

fish boiler = 1) a fish kettle.

fish boiler = 2) a Norwegian (slang).

fish bolt = a bolt for securing a fish plate.

fish bomb = a home-made bomb made from an empty glass bottle filled with fertiliser and kerosene used to stun fish on coral reefs for capture and sale in the aquarium trade.

fish bombing = use of explosives or cyanide to collect fish for food.

fish bone diagram = a graph used in quality control to identify possible problem causes.

fish bone meal = ground bones of animals and fish, high in calcium and phosphorus, and used in fish feeds and as a plant fertiliser. May pollute waters because of the high phosphorus content and so not used as extensively as in the past.

fish bone stitch = a series of diagonal, single-purl stitches zig-zagged across an unmarked line.

fish bone thistle = fish thistle.

fish bone tree = *Panax crassifolium*, a small tree from New Zealand.

fish bones = oscillations in soft x-ray emissions which have the appearance of fish bones.

fish book = a record of fish captures, e.g. a dealer's records of fish received from a fisherman in the cod fishery of Newfoundland.

fish bowl = 1) a round glass bowl used for keeping ornamental or pet fish.

fish bowl = 2) a situation where one's activities are constantly observed, scrutinised, commented on, etc.

fish bowl = 3) jail.

fish bowl granuloma = localised nodular skin inflammation (small reddish raised areas of skin) caused by the bacterium *Mycobacterium marinum*. Usually acquired by occupational or recreational exposure to salt or fresh water, often resulting from minor trauma during caring for aquaria.

fish box = 1) a box for storing and transporting fish, usually 15-50 kg.

fish box - 2) a wooden sailing vessel carrying dried cod to foreign markets (Newfoundland).

fish brain = in inline skating a slide where the skater grabs one skate with the hand closest to it.

fish breast = a plump fillet.

fish breath = halitosis in cats eating a diet of fish.

fish breeches = cod fish roe (Newfoundland).

fish brine = fish sauce.

fish broth = water (slang).

fish burger = a hamburger with the patty made from fish.

fish cadger = a fish hawker (Scottish dialect).

fish cake = 1) fish flesh mixed with potatoes, seasoning and sometimes eggs, butter and onions and formed into cakes or patties and fried in fat. Fish content may be 35-50% by weight and include such species as cod and haddock. Marketed cooked, cooked and frozen, frozen ready for frying, and canned.

fish cake = 2) fish before drying in the manufacturing process for fish meal.

fish camp = a camp used as a base for angling by a group of people; may be very simple or have accommodation and other facilities.

fish car = a railroad car with water tanks for transportation of live fish.

fish carle = a fisherman.

fish carrier = 1) a boat used to transport a catch of fishes from a vessel to the shore.

fish carrier = 2) a container used to keep fish alive during transportation.

fish carver = a carving knife used for fish. May be paired with a fork.

fish cask = a wooden barrel for the export of dried and salted cod (Newfoundland). See also fish drum.

fish catching box = a fry trap placed behind the monk, *q.v.*, to catch fish when a pond is drained.

fish census = a survey over time of fish species, numbers and relative abundance.

fish chip = a delicatessen potato chip-like product made of equal parts of fish and potato.

fish chorusing = sound production in fishes associated with reproduction. Various websites have recordings of the sounds made.

fish chowder = a thick soup mix of cooked fish and/or shellfish and potatoes in a broth made from pork, flour, seasonings and fish stock.

fish clamp = a type of fish spear with several prongs that hold a fish without excessive injury. The prongs may be pointed and barbed too but the purpose of the clamp is to secure the fish with little damage.

fish cleaning = the act of cleaning a fish for food. See fish cleaning in Symbols.

fish climber = a plant (?) whose red and black-kernelled beans when bruised and thrown into water will stupefy fish.

fish clip = fish clamp.

fish club = 1) a device used to stun or kill a fish when captured on hook and line or in a trap. Can be a simple piece of wood or intricately shaped and carved as with the Haida fish clubs of western Canada.

fish club = 2) an association of individuals devoted to angling. See also anglers association.

fish club = 3) an association of individuals devoted to keeping fish in aquaria.

fish cocktail = ceviche (raw white fish marinated in lemon or lime juice and served with sweet limes, avocados, onion rings, garlic, cilantro, chiles, boiled corn and tomatoes. Originally from Peru, variously modified).

fish collecting pool = a place where fish concentrate during the drying up or draining of a pond, usually behind the monk, *q.v.*

fish colony = Newfoundland.

fish content = the amount of fish in a product, often given as a percentage and minimum amounts required by law, e.g. in fish spread and cakes.

fish coop = 1) a wicker basket for catching fish.

fish coop = 2) a box about a metre square used in fishing through ice.

fish coop = 3) a large trap net made of stakes or a fence.

fish coop = 4) abbreviated form of fish cooperative.

fish cooperative = a jointly owned organisation furthering the catch, processing and sale of fish. Abbreviated as fish-coop (pronounced co-op).

fish coroner = a forensic scientist who determines how a fish has been caught, usually in legal cases involving poaching with nets and traps rather than the permitted hook-and-line method. The latter leaves evidence in the form of hook marks, and sometimes poachers try to fake them.

fish corral = barricade (a barrier used to lead fish into an enclosure, e.g. fyke net, pound net, etc).

fish court = the holding chamber in a trap net or the last chamber in any net.

fish crate = wooden container in which cod are processed in the Newfoundland Bank fishery.

fish credit water = water set aside in reservoirs for release downstream to maintain fish stocks.

fish crisp = a delicatessen product made from fish mince mixed with starch and sugar, expanding when cooked in oil and not like a potato chip.

fish crop = yield (1) catch in weight. Catch and yield are often used interchangeably. Amount of production per unit area over a given time. A measure of production. The sustainable yield is the quantity of fish which can be taken from a stock (usually on an annual basis) without severely depleting or eliminating that stock).

fish cross-handed = rowing a boat alone, especially for the purpose of catching fish (Newfoundland).

fish crow = a species of crow (*Corvus ossifragus*) in eastern North America feeding mostly on fish, usually dead fish.

fish culler = a person who sorted dried and salted cod into grades by cure, quality and size (Newfoundland).

fish culture = the artificial breeding and raising of fishes.

fish culturist = a person engaged in aquaculture.

fish curing = drying, salting, smoking and pickling of fish to extend their edibility.

fish currie = a small stool used by fishermen (Scottish dialect).

fish curve = a mathematical term for an ellipse negative pedal curve with the pedal point at the focus for the special case of the eccentricity  $e^2 = \frac{1}{2}$ .

fish cutter = a person who prepares fish for eating by removing fins, internal organs and bones and cuts large fish into fillets and steaks.

fish dance = 1) a dance of Great Lakes Indians involving flipping motions of the hands and feet.

fish dance = 2) any of a variety of dances world-wide involving fish and fishing, meant to improve catches by propitiating gods or celebrating a way of life.

fish davit = a crane-like device for raising or lowering equipment such as an anchor using a fish fall.

fish day = a day on which fish is eaten according to religious requirements; a fast day.

fish decoy = an imitation of a fish used to attract fish close enough to be speared. Used in ice fishing in North America.

fish dive = a ballet position where the dancer arches her back, lifts her head and bends back her legs with feet crossed. This position may be maintained while jumping or while supported, hence the name.

fish diverter = an electrical device that prevents fish from entering sensitive areas, e.g. power dams.

fish doctor = 1) the eelpout *Gymnelus viridis* (family Zoarcidae) found in circumpolar Arctic marine waters. The reason for its name is unknown, it may "clean" parasites from other fishes.

fish doctor = 2) the salve bug, *Aega psora*, an isopod crustacean parasite on cod and halibut. Used by fishermen in the preparation of a salve.

fish dog = an experienced fisherman (Newfoundland).

fish drawn = eviscerated fish. Drawn fish may still need to be scaled.

fish drier = fish flake (a rack on which fish are dried, often of spruce boughs on a framework of poles in North America).

fish drum = a drum-shaped wooden container for shipping dried cod (Newfoundland).

fish duck = any species of merganser.

fish dumpling = fish ball.

fish eagle = osprey (*Pandion haliaetus*) or any eagle feeding on fresh fish or fish as carrion such as *Haliaeetus*.

fish ear = an incorrect or slang term for the gills.

fish eater = 1) one who lives chiefly upon fish.

fish eater = 2) a knife and fork used in eating fish (British).

fish elevation = the elevation of a fish above the stream bed measured at the tip of the fish's snout.

fish elevator = a space at the base of a barrier (like a dam) into which fish swim. When enough fish accumulate in the collection area, they are nudged into a hopper that carries them into a flume that empties into the river above the barrier. Several hundred fish can be moved at a time.

fish emergence = departure of fry from the gravel into the water column.

fish emulsion = a fertilizer emulsion produced from the liquid remains of processed fish in fish meal and oil industries.

fish eye = 1) an eye like that of a fish.

fish eye = 2) a wide-angle lens on a camera covering about 180°.

fish eye = 3) a weld defect having a hole or piece of matter surrounded by a circular area of brightness.

fish eye = 4) a diamond or other gem cut too thin for proper brilliance.

fish eye = 5) a variety of moonstone.

fish eye = 6) an imitation diamond.

fish eye = 7) a small blemish in finished paper caused by a crushed and glazed particle.

fish eye = 8) a cold or suspicious stare.

fish eye = 9) blank, expressionless.

fish eye = 10) ocular lymphomatosis in fowl.

fish eye = 11) in oil drilling fluids, slang for a globule of partly hydrated polymer formed by poor dispersion during mixing. About 0.2-0.5 inches in size, they consist of a granule of unhydrated polymer covered by hydrated polymer and so are impervious to water and do not disperse.

fish eye disease = an inherited disorder in humans resulting in low HDL cholesterol and corneal opacity.

fish eyes = 1) a delicacy in some cuisines of Southeast Asia.

fish eyes = 2) slang for tapioca pudding.

fish face = 1) someone having a face reminiscent of a fish, although not necessarily having any features particularly fish-like.

fish face = 2) a term of abuse, sometimes used affectionately. Refers to an open mouth like a gaping fish and a blank expression, indicative of lack of brain function.

fish face = 3) the fleshy parts of a cod's head, eaten as a delicacy in Newfoundland.

fish fag = female fish monger.

fish fall = 1) the tackle depending from a fish davit used in hauling up the anchor to the gunwale.

fish fall = 2) rains of fishes (fishes falling from the sky like rain or in rain, the result of waterspouts and whirlwinds (see account by Gudger (1921))).

fish farm = 1) an aquaculture facility.

fish farm = 2) a sheltered area in a bay or harbour where cod are raised to maturity in netted enclosures.

fish fast = the observance of a fish day.

fish feed = commercial fish food, often in pellet form and based on fish oil and fishmeal.

fish fence = any structure made of wood, brushwood, mats, etc. used to catch or direct fish into traps. These may be in the form of a net narrowed inward to prevent fish finding the entrance again, to elaborate labyrinths. The general base form is triangular or heart-shaped, with complex fencing and multiple base forms in a labyrinth.

fish finder = 1) a sonar device or echo sounder used to locate fishes and determine water depth.

fish finder = 2) a surf-fishing rig comprising a pyramid-shaped sinker running freely along the line; this allows the bait to be carried by the tide or run by a fish.

fish finger = fish stick.

fish flag = a flag flown from a sport fishing boat to indicate to observers on shore that a significant catch of that species had been made. Usually a coloured drawing of the fish species.

fish flake = a rack on which fish are dried, often of spruce boughs on a framework of poles in North America.

fish flakes = cooked haddock or cod flesh broken up into flakes and then canned.

fish flee = a bluebottle fly (Scottish dialect).

fish float = the swimbladder of a cod (Newfoundland).

fish flop = a somersault involving flipping feet in the air.

fish flour = a flour made of pulverised, dried fish parts.

fish flows = artificially increased flows in a river system instituted to move young fish quickly downstream during their spring migration period.

fish fly = 1) a large, soft-bodied insect found near streams with aquatic larvae called hellgramites used as fish bait (*Corydalidae*, *Megaloptera*).  
2) the rove beetle (*Staphylinus villosus*) which swarmed in older fish processing sheds. Also called fish beetle.

fish fly = 3) fish frame (the remains of a filleted cod (Newfoundland)).

fish food = the food eaten by fishes, cf. fish-feed.

fish for = to try subtly or deviously to obtain information or a response.

fish for compliments = to try and obtain praise by subtle of devious means.

fish for herring and catch a whale = to get a result other than the expected one.

fish for oneself = 1) to get all one can, to seek one's own profit exclusively.

fish for oneself = 2) to rely on one's own efforts.

fish for stamps = fishing long enough to be eligible for unemployment insurance (Newfoundland).

fish fork = 1) a large, short- to long-handled fork used in unloading fish. With one or two tines.

fish fork = 2) a 4-tined fork used in eating fish, larger than a salad fork.

fish frame = the remains of a filleted cod (Newfoundland). See also fish fly.

fish fry = 1) an indoor or outdoor party where fish and seafoods are cooked and eaten.

fish fry = 2) fried fish.

fish fry = 3) fry or young fish.

fish fuddle = the Jamaican dogwood (*Piscidia*) a small tree of Florida and the West Indies yielding fish poison.

fish fuddle tree = Florida fish-poison tree or Jamaican dogwood.

fish fumet = a concentrated fish stock made with vegetables, spices, wine and fish bones including the head without the eyes. The fish bones and spices are added to blanched vegetables such as carrots, leeks, onions, lettuce and celery and, when the bones start to break

down, wine is added and the mixture reduced. Water is added and the mixture cooked for 30-45 minutes and then strained before serving.

fish fungus = 1) an aquatic fungus (*Saprolegnia* spp.) that attacks living fish in crowded conditions such as aquaria and aquaculture facilities.

fish fungus = 2) a reddish fungus (*Clathrocystis roseopersicina*) found on salted cod.

fish gaff = a long pole with a metal hook on the end, used to secure large fish caught on hook-and-line and haul them on board a vessel.

fish garth = a dam or weir in a river for keeping or catching fish.

fish gate = a gate in the walls of ancient Jerusalem where the fisherman of Galilee would bring in their catch.

fish gel = surimi, q.v., with salt added and heated to 90°C and called kamaboko.

fish gelatin = isinglass (the glutinous or gelatin-like fluid prepared from the collagen of the outer layer of gas bladders of sturgeons or other fishes. Used in clarifying wines and beers, for jams and jellies, in printing inks and as an adhesive cement).

fish geranium = a cultivated herb (*Pelargonium hortorum*) with scalloped, crenate leaves and a broad colour zone inside the margin.

fish gig = 1) a pole with barbed prongs for striking fish. Loaded at the end with lead.

fish gig = 2) an arrangement of hooks dragged through the water to foul-hook fish.

fish glass = a tube with a glass end used to locate schools of cod from a boat in Newfoundland. Also called water glass.

fish globe = a spherical glass container for keeping pet fish.

fish glue = 1) isinglass (the glutinous or gelatin-like fluid prepared from the collagen of the outer layer of gas bladders of sturgeons or other fishes. Used in clarifying wines and beers, for jams and jellies, in printing inks and as an adhesive cement).

fish glue = 2) a liquid glue made from the bones, fins and skin of fish by heating in water, used cold for bookbinding, for example.

fish god = 1) Atargis (Dagon, the fish god of the Philistines, the upper half being a man and the lower half a fish. The fish half represented fertility).

fish god = 2) Dagon (the fish god of the Philistines, the upper half being a man and the lower half a fish. The fish half represented fertility. The name is from the word dag, meaning fish. The Babylonians had a myth of a being who emerged from the Erythraean Sea, being part fish and part man. Also found in Assyrian sculpture).

fish god = 3) Ea (a Sumerian fish god living in a submarine palace. See also apkallu fish).

fish god = 4) Fuxi, (the Chinese amphibious god, a founder of their civilisation, with a man's or woman's head and a fish tail).

fish god = 5) Oannes (the foremost of the the fish men who brought civilisation to the Babylonians. Lived on land during the day but had to return to water at night. Became the fish god Dagon later).

fish god = 6) Oe (Oannes).

fish god = 7) Triton (a merman, the son of Poseidon and Amphitrite, human above the waist but fish-shaped below. Known as the trumpeter of the sea since he blew on a conch).

fish god = 8) Vishnu (Mahavishnu took the form of a fish to retrieve the vedas from the Asura Hayagreevan (head of a horse) and also to safeguard herbs and seeds at the end of one cycle of creation).

fish goddess = Hat-Mehit (a goddess from Mendes in Lower Egypt in charge of the the rare fish cult, depicted as human with a fish over her head or as a fish).

fish gorge = an old piece of fishing gear comprising a short piece of wood, bone, horn, flint or metal, variously shaped, but having sharp ends, usually a central attachment for the line, and embedded in bait. When the fish swims away, having swallowed the baited gorge, it lodges crosswise in the throat. Variants have line attached at one end and the other end pointed, a cross-shape that spreads open when the line is pulled, and the spring-gorge or spring-angle, q.v.

fish grained split = a book binding of a sheepskin split, dyed and embossed with a gunpowder grain.

fish grass = water shield or fanwort (*Cabomba caroliniana*), an aquatic plant of North America.

fish gravy = fish sauce, e.g. Thai fish sauce.

fish gription = the ability to hold a slippery fish long enough to take a photograph (slang).

fish guano = fertiliser made of fish; or fish manure.

fish guide = 1) any device used to direct fish to a certain place for capture or avoidance of danger, e.g. lights, bubbles, sound, electricity.

fish guide = 2) a professional fishing guide who directs the angler to spots where trophy fish can be found and advises on tackle to catch them. See also ghillie.

fish hair = synthetic hair used in tying streamers (q.v.) and saltwater flies.

fish halfpenny = a small, nineteenth-century halfpenny piece with the figure of a split codfish on one side.

fish ham = tuna or marlin flesh mixed with whale and pork in a sausage (Japan).

fish handler's disease = erysipeloid, a dermatitis from handling fish contaminated with bacteria.

fish handling = operations such as growing, harvesting, processing, packing, storing, transporting, distributing, marketing and selling of fish.

fish harvester = someone who catches or cultures fish for a living.

fish hatchery = a place or establishment for spawning, incubating and hatching fish eggs and for the rearing of young for release into the wild.

fish hawk = 1) osprey (*Pandion haliaetus*).

fish hawk = 2) fish dog.

fish hawker = a seller of fish, usually by travelling about and calling out his wares.

fish head = 1) an apparatus for withdrawing the clacks of pumps through the column.

fish head = 2) severed head of a fish, sold as food. Sometimes a delicacy, sometimes sold to the poor.

fish head = 3) a derogatory term for a Chinese person.

fish head curry = a staple Malaysian food.

fish hedge = a trap made of bamboo screens.

fish hold = an enclosed space on a vessel for storing fish; may be insulated and/or refrigerated.

fish home = the sea (Old English).

fish hood = the state or condition of fish (rarely used).

fish hook = 1) a bent piece of wire with its tip sharpened and often a barb below the tip used to catch fish. Available in many sizes and styles. May be single, double or treble but all these are counted as one hook in angling regulations. Hooks separated by stretches of line are counted as multiple hooks. See hook for more detail.

fish hook = 2) a large hook with a pendant to which the fish tackle is hooked in fishing an anchor.

fish hook = 3) a sharp broken strand in a wire.

fish hook = 4) book (Cockney rhyming slang).

fish hook cactus = cholla cactus (*Opuntia* spp.) or barrel cactus (*Ferocactus wislezenii*) of the American southwest with hooked spines.

fish hook displacement = a medical condition in humans where the stomach is displaced. The orifice of the pylorus faces directly upward and the duodenum runs upward and to the right to join the pylorus at an angle, producing a constricting hook. Asymptomatic.

fish hook flea = a crustacean (*Cercopagis pengoi*, Cladocera) from the Black and Caspian seas now introduced to North American lakes. Their tails are long, spiny and shaped like a fish hook and they hook themselves together, clogging fish nets and lines.

fish hook money = Persian larin money, scimitar-shaped.

fish hook wire = a wire of twisted strands with a piece of wire resembling a fish hook inserted at intervals.

fish hooked wire = fish hook wire.

fish hooks = fingers (slang).

fish hooks in one's pocket = to be very cheap. From Samuel Mulford who sewed fish hooks in his pockets on a visit to London in the eighteenth century to avoid pickpockets.

fish hoop = a structure on a mast on which the lower end of a fish (a strengthening piece of wood in a fish shape) is driven.

fish horn = a tin horn that was used by fish sellers or on fishing boats.

fish house = 1) a building where fish are stored or processed. Also called fish room.

fish house = 2) a restaurant serving or specialising in fish and seafood.

fish house = 3) a building from which fish are sold.

fish house = 4) fish top (a movable box-like structure to cover piled cod-fish. Also called fish room).

Fish House = 4) the first public aquarium in the Zoological Gardens, Regent's Park, London, established 1853.

fish house punch = a punch made of rum and brandy and water or tea sweetened with sugar syrup. Developed at the Fish House Club, formed in 1732 by a group of anglers who fished for perch on the Schuylkill River.

fish hut = a small, moveable shack placed over a hole in the ice in winter to protect the fisher from the elements. May be heated and have other facilities.

fish hydrolysate = ground up carcasses (guts, bones, scales, cartilage, etc.) after the flesh has been removed for human consumption.

fish hygiene = the processes that make sure food fish are safe for human consumption.

fish in aspic = fish in jelly.

fish in jelly = fish cooked in acidified brine or vinegar, fried or smoked and then packed in gelatin, gelatin and pectin or aspic. Sometimes includes cucumbers, onions and spices.

fish in the round = fish for eating that have not been cleaned, without the head, the fins and guts removed.

fish in troubled waters = to try to take advantage of a confused situation. Fish reputedly bite better in rough water.

fish insect = silverfish, a primitive, wingless thysanuran insect with a body covered in silvery scales, commonly found in houses, e.g. *Lepisma saccharina*.

fish iron = a fish spear made of iron and having 5, 7 or 12 points.

fish joint = 1) a joint formed by fitting a wedge into a v-slot or a w-slot.

fish joint = 2) a joint where two abutting units are held together by a fish plate, *q.v.*

fish keeper = may mean either pondkeeper, *q.v.*, or aquarist *q.v.*

fish keeper's granuloma = an infection in humans with the bacteria causing fish tuberculosis (a *Mycobacterium*, but not the same as the one causing human tuberculosis). It is probably the only zoonosis of note to aquarists. It appears as a skin infection, usually on the hands or forearms where there was an earlier cut, and may be inflamed, suppurating, encrusting and irritated. Not usually serious unless the infected individual is already immuno-suppressed. Treatment requires antibiotics. Also called fishtank granuloma.

fish kettle = a long kettle for boiling fish whole, often with a removable grid so the fish can be removed in one piece without it falling apart.

fish kill = a die off of fishes within a relatively short period due to the onset of man-caused or, more rarely, natural factors, e.g. pesticide related mortalities, red tides, drought. See also winterkill and summerkill.

fish killer = 1) an aquatic insect of the family Belostomatidae, e.g. *Lethocerus americanus*, which feeds on small fishes.

fish killer = 2) a successful commercial fisherman in Newfoundland.

fish killer tree = a member of the brazil nut family, Lecythidaceae, *Barringtonia asiatica*, containing saponins in the leaves which are ground and thrown into water to paralyse fish.

fish king = a legendary king of fishes who, if caught and released, gratefully directs fish into the nets of fishermen.

fish kit = supplies given to a new prisoner (toiletries, pen, paper and envelopes).

fish knife = 1) a small knife with an ornamental upper edge used in eating fish along with a fork.

fish knife = 2) a large knife with an ornamental upper edge and a broad blade used in serving fish with a large fork.

fish ladder = a series of steps with flowing water and pools enabling a fish to circumvent an obstruction such as a dam or waterfall by leaping from step to step. Also called fishway, fish pass.

fish lead = a type of sounding lead used without being removed from the water between soundings.

fish leather = treated fish skin used in garments, shoes, handbags, belts, jewelry, briefcases, wallets and novelty items.

fish leaves = the floating leaves of the common pondweed (*Potamogeton natans*), or the plant itself, said to shelter fish.

fish leech = an annelid worm with some members parasitic on fishes, notably *Piscicola*. Rarely causes much damage but can transmit blood parasitic protozoans and possibly bacteria and viruses, as well as causing secondary infections. May cause anaemia, lethargy and restlessness. Rare in aquaria but common in fish ponds and in the wild.

fish lice (singular louse) = parasitic crustaceans on marine and freshwater fishes. The common ectoparasite is *Argulus* (Branchiura) which can move around on its host, causing several wounds. May result in lethargy, loss of appetite, anaemia through blood loss, osmotic stress and secondary infections. The effects of irritation are restlessness, darting, jumping, scratching and overproduction of mucus. Various chemical treatments of aquarium water will remove the parasite although they are often large enough to be picked off with tweezers as long as a topical antiseptic is applied to the wound site.

fish lift = 1) fish way.

fish lift = 2) fish elevator.

fish line = 1) a line made of twisted hair, silk, monofilaments or other material used in angling.

fish line = 2) line used to pull items from one cell to another (prison slang). See also fishing pole.

fish lip = to slobber on the end of a marijuana cigarette.

fish liver oil = oil extracted from fish livers (cod, halibut, sharks) and used industrially or as a source of vitamins A and D.

fish liver paste = fish liver ground up with salt, spices and other flavouring ingredients.

fish loaf = flaked fish baked in a loaf with bread crumbs and seasonings.

fish lock = 1) a fish weir, in the sense of a dam forming a retaining reservoir harbouring fishes.

fish lock = 2) a lock which allows fish to swim upstream bypassing a weir or other obstacle, sometimes with the aid of a fish ladder.

fish locker = a compartment on a boat used for storing fish.

fish loft = the area of a fishing stage, *q.v.*, where dried cod are stored.

fish lore = study of fishes; ichthyology.

fish louse = any crustacean parasitic on fishes. Usually refers to *Argulus* (Branchiura) found on the skin and occasionally the buccal cavity. Causes ulcers at the attachment point.

fish lure = a natural structure attractive to fish, e.g. the modified mantle of mussels or clams which resembles a small fish, and thus attracts a larger, predatory fish. The larval glochidia of the mussel can then attach to the predator as it tries to strike the lure.

fish magnet = a moveable electrode used to bring up a school of fish that normally is too deep for a purse seine to catch.

fish maker = a person curing cod on flakes (*q.v.*) in Newfoundland.

fish malodour syndrome = fish odour.

fish man = 1) a person cleaning fish as food.

fish man = 2) a seller of fish.

fish man = 3) a fisherman.

fish man = 4) a student of ichthyology.

fish manure = dried and powdered fish used as fertiliser in fish ponds to enhance productivity.

fish market = 1) any area selling fish but usually refers to a large covered establishment with diverse products. Famous fish markets include Billingsgate (London), Tsukiji (Tokyo) and Fulton (New York), all *q.v.*

fish market = 2) the lowest hole at bagatelle.

fish market = 3) a brothel.

fish marking = a system involving various methods (fin clipping, colouring, biotelemetry, radioactive markers, tattooing, branding, tagging, etc.), used for individual identification and for studies on movement, growth and other biological parameters.

fish maturity = attainment of first spawning.

fish maw = the dried stomach or swim bladder of a fish used for industrial purposes.

fish meal = dried fish or fish waste used as fertilizer, animal food or ground fine for use in soups. May be defatted, and is powdered or granular in form.

fish meter = an officer of the Fishmongers Company.

fish mill = a circularly swimming mass of fishes, usually formed only by obligate schoolers.

fish mint = aquatic or moist-growing mints (*Mentha aquatica* and *M. longifolia*).

fish mite = a parasite infesting salt fish.

FISH mode = FISH queue.

fish mold = a water mold growing on fish (saprolegniasis, a fungal infection from *Saprolegnia* and *Achlya*, usually a secondary infection after skin damage or scale loss but also affecting eggs in hatcheries).

fish money = a bounty for a certain number of fish caught.

fish monger = 1) a dealer in or seller of fish.

fish monger = 2) a bawd, presumably a corruption of flesh monger, dating from the mid-sixteenth century.

fish monger = 3) a pimp (slang since the 1500s).

fish monger = 4) a lecher or whoremonger (1800s Britain).

fish monger's daughter = a whore; slang from late sixteenth century.

fish moth = silverfish and fire brats, insects found in houses and having silvery scales.

fish mousse - a mousse made with fish.

fish mouth = 1) turtlehead, a perennial North American herb (*Chelone glabra*).

fish mouth = 2) an opening at the exposed edge of a roofing ply sheet where the asphalt bond is lacking or the felt is wrinkled.

fish mouth meatus = a medical condition in humans; a red and swollen and everted condition of the orifice of the urethra (meatus) in the first stage of acute gonorrhea.

fish mouth stenosis = an extreme medical condition in humans describing the narrowing and ineffective opening of the mitral valve of the heart.

fish mummy = fish were a staple item in ancient Egyptian diets and were also mummified as representatives of various gods, e.g. *Lates niloticus* (Latidae) was worshipped as a form of the goddess Neith at Esna, giving rise to the town's Greek name of Latopolis and *Schilbe mystus* (Schilbeidae) was the fetish of the delta nome of Mendes, whose local goddess was called

Hatmehyt ("foremost of the fishes") who is usually depicted with a *Schilbe* on her head. Fish-eating was banned in areas where certain fish species were venerated.

fish net = 1) any net used to catch fishes.

fish net = 2) any material having the open mesh pattern of a fishnet, e.g. women's stockings.

FISH net = 3) nothing to do with fish; computer slang for "first in, still here" referring to slowed or stopped processes, in this case on a network. See also FISH.

fish net = 4) the shape of the city of Wung-chun, China, laid out in this shape to be viewed from above. See also carp.

fish net buoy = a buoy marking the limit of fish net.

fish nuggets = fish pieces formed into small irregular shapes, breaded and served fried.

fish odour = a genetic disorder giving a rotting fish odour to a person's breath, urine and sweat. Caused by lack of an enzyme that would process an odour-causing protein, trimethylamine. Also called fish odour syndrome.

fish odour syndrome = fish odour.

fish offal = fish waste.

fish oil = any oil obtained from fishes, usually from the liver, but in fatty fishes from the body, or from fish wastes. Used in fish feeds, edible fats, soaps, paints, leather work and making linoleum.

fish on the fish's terms = doing something appropriately, being prepared.

fish on the fly = fishing by dropping dories in rapid succession and setting and hauling trawl-lines; in the Bank schooner fishery off Newfoundland.

fish only = a saltwater aquarium that only contains fish with non-living rocks, corals, shells, and other decorative items. Abbreviated as FO or F/O.

fish or cut bait = to decide, to take action or not (American slang).

fish or no fish = an expression of determination; regardless of circumstances (Newfoundland).

fish out = 1) exhaustion of the fish supply in a water body; to denude an area of fish. See also catch out.

fish out = 2) to remove an object from a receptacle or from water.

fish out of the coop = a capon, so-called by monks who wished to evade the Friday fast by eating chickens instead of fish.

fish out of water = a person in an uncomfortable or unfamiliar situation.

fish owl = a fish-eating owl of the Old World genera *Scotopelia*, *Bubo* and *Ketupa*. Pel's fishing owl, *Bubo peli*, of Africa, is said to make the sound of "a lost soul falling into the bottomless pit".

fish paper = 1) vulcanised cotton fibre used for electrical insulation.

fish paper = 2) paper on which cooked fish is laid, presumably waxed.

fish pass = 1) fish passage facility.

fish pass = 2) a cut dredged through a barrier island allowing tidal flushing and movement of fish.

fish passage centre = a centre that plans and implements an annual smolt monitoring program, developing and implementing flow and spill requests; and monitoring and analyzing research results to assist in implementing a water budget.

fish passage efficiency = the proportion of juvenile fish passing a project through the spillway, sluiceway, or juvenile bypass system, as opposed to passing through the turbines.

fish passage facility = a feature of a dam that enables fish to move around, through, or over without harm. Generally an upstream fish ladder or a downstream bypass system.

fish passway = fish passage facility.

fish paste = fish mixed with salt and ground to a fine consistency with or without added fat, spices and other seasonings. Should contain 70% or more fish. Used as a sandwich spread.

fish paunch = fish (9) a piece of timber used to strengthen a mast or spar when sprung, often somewhat fish-shaped).

fish pea = a small part of the cod intestine, consumed as a delicacy in Newfoundland.

fish pearl = a glass bead coated with essence d'Orient, q.v., to make an artificial pearl.

fish pen = 1) an enclosure in the water for aquaculture made of netting on a frame; it serves to keep desired fish in and unwanted species out.

fish pen = 2) a wooden bin for salting cod in Newfoundland.

fish pendant = a large block hanging from the end of a davit.

fish pepper = a cultivar of the chili pepper plant *Capsicum annuum*. The fruit resembles a swimming fish because of its variegation.

fish pest = any deadly epidemic disease of fishes.

fish picker = a commercial fisherman (Alaska).

fish pickle = small fish pieces deep-fried in vegetable oil, mixed with vinegar, salt and spices. The mix is allowed to mature for a day before packing.

fish pie = fish, minced and baked with potatoes, and sometimes mixed with vegetables, in a pastry.

fish piece = fish (9) a piece of timber used to strengthen a mast or spar when sprung, often somewhat fish-shaped).

fish pier = a pier for fishing boats to tie up at.

fish pile = a stack of split and salted cod at various stages of the drying process (Newfoundland).

fish pipe = the oesophagus of a seal (Newfoundland).

fish plate = 1) one of the plates of a fish joint, *q.v.* Strengthens a joint by overlapping, e.g. a flat piece of metal connecting railway rails to the ties or connecting pieces of masonry.

fish plate = 2) the perforated drainage grid of a fish kettle, *q.v.*

fish poison = 1) usually any plant which is poisonous or intoxicating to fish, causing them to float to the surface for capture.

fish poison = 2) *Lepidium piscidium*, a cress found on Pacific islands and formerly eaten as a relish and antiscorbutic by seamen.

fish poison bark = Florida fish-poison tree.

fish poison tree = various trees come under this heading as parts are used to poison fish, e.g. *Acacia ditricha* (family Mimosaceae), the leaves of which are poisonous to fish when rubbed in a bag until a soapy foam comes out (Australia), and various *Piscidia* species (Leguminosae) such as *P. mollis* where leaves are used (southwest United States and Mexico).

fish poison wattle = *Acacia holosericea*, the leaves of which are poisonous to fish when rubbed in a bag until a soapy foam comes out (Australia).

fish poisoning = 1) use of a chemical spread on water or added to a bait to poison fish and facilitate capture. Natural (plant-based) fish poisons include crow's eyes (seeds of *Nux vomica* containing strychnine), common yew (leaves of *Taxus hoccata*, effectiveness disputed), juniper, cyclamen (tuber sap of *Cyclamen europaeum*), common daphne (boiled blossoms of *Daphne mezereum* containing saponin), spurge (*Euphorbia esula*), ox-tongue (leaves and roots of *Anchusa officinalis*), thornapple (*Datura camonium*), tobacco (*Nicotiniana*) common henbane (*Hyoscyamus niger*), mohua (seeds of *Bassica latifolia*) and mullein (boiled blossoms of *Verbascum*), toothache tree (seeds of *Xanthoxylum alatum*), among others. See also fish-seed, ghaniori and rotenone.

fish poisoning = 2) illness caused by eating poisonous fishes, *q.v.*

fish pole = fishing rod.

fish pomace = fish remains after oil has been extracted; often used as fertiliser. Also called fish scrap, fish waste.

fish pond = 1) a freshwater pond in which fish are kept.

fish pond = 2) an enclosed or gated coastal body of water used in aquaculture, e.g. in Hawaii for milkfish and bonefish. Fish enter on tides, through a gate or are stocked.

fish pond = 3) the sea (jocular).

fish pond = 4) a depression in a card table where fish-shaped counters are kept.

fish pond = 5) an attraction at a fair where miniature fishing gear is used to hook fish-shaped tokens from a small pool to win prizes.

fish pond = 6) the female genitalia (U.S. slang, mid-1900s).

fish pool = fishpond, a pool containing fish.

fish porn = 1) piscatorial pornography (pictures of large fish that anglers drool over (from "The Economist" 22 December 2007, online edition)).

fish porn = 2) large fish and well-developed female *Homo sapiens* in some magazines devoted to this unlikely combination.

fish portion = a piece of a wet fish of specified uniform weight or size (about 2 cm thick) cut from a fillet, or a piece of a frozen fish usually rectilinear and of specified size and weight cut from a block of frozen fish flesh; wider than a fish stick or of a different shape.

fish pot = 1) a portable cage-like trap which fish enter through a small opening and from which they cannot readily escape because of the funnel shape. May be baited or not, made of various materials, of various sizes and shapes, and of various local names from country of use or species of capture, e.g. eel pot, Scottish creel. Used to catch crabs, lobsters and occasionally fishes.

fish pot = 2) a junk fishing boat.

fish potter = a person in charge of, or uses, fish pots (1).

fish pound = 1) a net or fence set in streams or along the coast to direct fish into a holding container for easy removal. Also called trap net or setnet.

fish pound = 2) a wooden container in which cod are placed for curing in Newfoundland.

fish powder = a Thai product sold in glass jars, made from smoked fish with or without chilies.

fish pox = carp pox (one of the oldest known fish diseases found in cultured carp, other cyprinids, pike-perch and aquarium fishes. It is caused by *Herpesvirus cyprini*. Also known as carp papillomatosis, epithelioma papulosum, fish pox, cyprinid herpesvirus I (CHV). Skin lesions appear as the water temperature drops in winter as small milky-white spots that merge and cover large skin areas).

fish prong = fish fork (1).

fish protein concentrate = a flour comprised of dried and powdered fish used as a food supplement. It is odourless, tasteless and has more protein than in the original fish flesh. Abbreviated as FPC.

fish proud = a self-satisfied person on account of a large or profitable catch of fish (Newfoundland).

fish pudding = fish ball.

fish pump = a mechanism for transferring large volumes of relatively small fish in water from a net into a ship by means of a pump and associated flexible pipes.

FISH queue = nothing to do with fish; computer slang for "first in, still here" referring to slowed or stopped processes. See also FISH mode and FISHnet.

fish raceway = concrete, elongate and rectangular fish-rearing unit generally associated with a hatchery which has a large volume of flowing water, able to sustain greater fish densities than ponds, and able to maintain a cleaner environment. Used particularly for trouts, and less often catfishes. May be 100 mm long, 1-10 m wide and 0.5-1.5 m deep and made of concrete (usually), brick, tile, earth or lined with plastic.

fish rack = 1) a structure for suspending fish fillets for drying and curing. Also called dry rack. See also rack.

fish rack = 2) a weir.

fish racket = a Newfoundland expression for the habitual occupation of fishing.

fish rain = fishes falling from the sky like rain or in rain, the result of waterspouts and whirlwinds (see account by Gudger (1921)).

fish rake = a set of hooks attached to a structure such as an iron bar up to 8 metres wide towed behind a boat and impaling any fish encountered.

fish range = a place for catching and drying fish.

fish rearing = cultivation and propagation of fishes.

fish room = 1) fish hold (an enclosed space on a vessel for storing fish; may be insulated and/or refrigerated).

fish room = 2) a piece of land by the shore from which a fishery was conducted in Newfoundland.

fish room = 3) the stages. *q.v.*, flakes, *q.v.*, stores, crew and family housing, and other facilities where a fish catch was landed and processed in Newfoundland.

fish room = 4) a small building for storing dried and salted cod in Newfoundland.

fish room = 5) fish top (a movable box-like structure to cover piled cod-fish. Also called fish house).

fish rope = fish fall.

fish rots from the head down = corruption starts at the top of an organisation.

fish row = cells where new prisoners are placed (prison slang).

fish royal = sturgeons, whales, dolphins and porpoises are termed this. If caught within three miles of the coast of the United Kingdom, they belong to the Crown.

fish run = a group of fish migrating up a river, usually for spawning.

fish salad = cooked, marinated or salted fish that is chopped or diced and added to salad.

fish sanctuary = a place or time where/when fishing is not allowed to protect the stocks or species; for fish to spawn, rear young or rest.

fish sauce = various fish species have been used in fish sauces, e.g. and *q.v.* cut lunch herring, fermented fish sauce, fish sauce, garum, ketchup, liquamen, milt sauce, moochim, muria, mustard herring, etc. Often used for an oriental spicy condiment or flavouring made from salted and fermented anchovies or other fish, including tuk trey (Cambodia), nam pla (Thai), nuoc nam (Vietnamese), patis (Philippines) and shottsuru (Japanese). These sauces are pungent and strong-flavoured.

fish sausage = fish flesh, such as tuna, ground with fat, seasoning, spices and sometime a filler such as cereal and encased in a skin. May be cooked or smoked before or after encasing.

fish scale = 1) any pattern or design resembling fish scales. See fish scales.

fish scale = 2) a fish's scale.

fish scale = 3) slang for uncut cocaine.

fish scale = 4) a diminutive five-cent silver coin minted 1865-1947 (Newfoundland).

fish scale disease = ichthyosis (a congenital skin disease in humans where the epidermis becomes hard, rough and scaly. Also called fishskin disease).

fish scale gallbladder = a gallbladder with a fish scale-like appearance due to multiple small cysts of the mucosa.

fish scale tile = a tile shaped like a fish's scale.

fish scales = 1) a grain pattern in leather resembling the scales of a fish. Once used by bookbinders who wanted a leather giving the effect of being blind tooled.

fish scales = 2) a scale pattern on the bottom of waxless skis which helps prevent the skis from sliding backwards.

fish scope = the cathode ray tube element of a fish finder.

fish scrap = fish remains after oil has been extracted; often used as fertiliser. Also called fish pomace, fish waste.

fish screen = 1) a screen across a body of water or structure, e.g. the turbine intake of a dam, designed to divert the fish into a bypass system.

fish screen = 2) a grating or mesh positioned in a river to strain fish from the water. Fences or netting direct fish onto the screen where they run aground while the water drains through the mesh.

fish screw = a device for pressing dried cod into a cask or barrel.

fish seed = 1) fertilised eggs, fry or fingerlings used for growing in aquaculture facility or for stocking grow-out areas.

fish seed = 2) kokkel-seed or lice-seed, the fruit of *Anamirta cocculus* a creeping shrub of Asia. Contains pikrotoxin used in small pellets of dough thrown in the water to stupefy fish eating them.

fish service = a china service for fish with a platter, sauce boat and plates.

fish shed = fish house (Maritime Canada).

fish shelter = an artificial structure made from twigs, brush, branches, concrete blocks, etc. as a refuge or hiding place for fish at which they are also easily caught.

fish side = the flesh side of a split fish as opposed to the skin side (Scottish dialect).

fish silage = liquefied fish waste produced by self-digestion, with the addition of acid to prevent decay, or fermentation and used for animal feed. Also called liquid fish.

fish skin = 1) the skin of a fish.

fish skin = 2) a condom.

fish skin = 3) a dollar bill.

fish skin disease = ichthyosis (a congenital skin disease in humans where the epidermis becomes hard, rough and scaly. Also called fish-scale disease).

fish skin grain = a grain in leather resembling fish skin.

fish skinner = a ridged roller to remove fish skin and scales. There are small hand-operated models for sport fishermen and hand-operated or powered models for skinning fish on a commercial scale (no pun intended).

fish slapping dance = Monty Python sketch involving slaps across the cheeks with fish while dancing.

fish slice = 1) a broad knife for lifting and dividing or carving fish at a table.

fish slice = 2) an implement used by cooks for turning fish in a pan.

fish slide = an inclined structure of box-like shape set in a stream at a ripple or small waterfall to catch descending fish.

fish slime disease = a condition in humans where septicaemia follows a puncture wound made by the spine of a fish.

fish soluble = a water-soluble protein byproduct of fish meal production, usually condensed to 50% solids and sold as condensed fish solids. A concentrated form of stick water.

fish sound = gas bladder (a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, sound receptor, respiratory organ. Found in Actinopterygii. Often lacking in bottom fishes. Sometimes called air bladder, a less appropriate term).

fish soup = any soup made from fish with seasonings and vegetables.

fish spear = 1) a spear with 3-5 prongs on the end in various arrangements used to capture fish.

fish spear = 2) a trident with barbs or flukes is the symbol for the staff of Greek Poseidon or Roman Neptune, gods of the sea.

fish spinner = a hurricane, cyclone or typhoon.

fish staff = a gaff or fish hook.

fish stake = one of a series of poles or stakes placed in shallow water to outline fishing areas.

fish stamp = fish are popular organisms on postage stamps as an internet will show.

fish steak = a cross-section slice of a large, dressed fish.

fish stearin = a solid formed from fish oils and used in lubricants and coarse soaps.

fish stew = a small pond where fish are kept for eating, now obsolete. Also called vivarium.

fish stick = 1) fish marketed in the form of rectangular sticks cut from a block of frozen fish fillets, breaded, fried in fat, or sold frozen for cooking. Usually 1-3 oz in weight. See also goujonettes de sole and fish finger.

fish stick = 2) a fish spear with a single point.

fish stinks from the head down = fish rots from the head down.

fish stock = 1) a distinct genetic population, a population defined by movement pattern, part of a population potentially harvestable, or a quantity of fish from a given area; usually isolated from other stocks of the same species and so self-sustaining. May be a total or a spawning stock.

fish stock = 2) used for steaming fish; made of lightly salted cold water, bones and trimmings of fish, seasonings, simmered for half an hour, strained when almost cold and a little white wine or vinegar added.

fish stone = a stone table used for the sale of fish, presumably because it is easily washed and cleaned.

fish store = 1) a store selling fish.

fish store = 2) a building where dried cod from the offshore fishery was stored for collection or export (eastern Canada). Cod were also cleaned, washed, salted and stored in large puncheons. Also used to store gear in winter and spring and as a place to mend nets. The floorboards were kept loose so that unusually high tides would simply lift the boards and not damage the store. A launch enabled boats to be hauled out of the water for repair and painting. A rail on the wharf was used for drying nets. Flakes (*q.v.*) or platforms of boughs were erected in nearby fields and salted fish were laid out on them to dry in the sun. Such fish kept for long periods, even under tropical conditions, without refrigeration.

fish story = a tall tale, an unlikely story, an exaggerated narrative, a yarn.

fish stove = fish stew.

fish strainer = 1) a metal colander for taking fish from a boiler.

fish strainer = 2) a perforated earthenware slab at the bottom of a dish allowing liquid to drain from a boiled fish.

fish supper = 1) an evening meal where fish is the main item.

fish supper = 2) fish and chips, *q.v.*

fish symbol = ichthus (a representation of a fish; an amulet or talisman shaped like a fish; an iconographic symbol for Christ from the initials in the Greek phrase Iesous Christos Theou Huios Soter (Jesus Christ Son of God Saviour). Also spelt ichthys).

fish tackle = 1) wire tackle for emptying the cod end of a trawl, stronger than gilson tackle.

fish tackle = 2) equipment to raise the flukes of an anchor to the gunwale. Also called fish block.

fish tail = 1) the tail or caudal fin of a fish.

fish tail = 2) any device shaped like a fish tail.

fish tail = 3) the uncontrolled movement of the rear end of a vehicle, e.g. on snow or ice.

fish tail = 4) to swing the tail of an aeroplane from side to side in order to reduce speed.

fish tail = 5) an arrow wobbling in flight.

fish tail = 6) a turning ballroom step.

fish tail bit = a drilling bit shaped like a fish's tail.

fish tail burner = a type of gas burner, having two openings in the top, from which the jets of gas issue and form a flat flame, the plane of which is at right angles to that of the openings.  
fishtail cutter = a cutter for milling slots and keyways.

fish tail lawyer cane = a palm of the Arecaceae family, *Calamus caryotoides* from northern Queensland.

fish tail palm = a palm of the Arecaceae family in the genus *Caryota* from tropical Asia.

fish tail point = a fluted and stemmed, fishlike stone tool from South America dating to 11,000-8000 B.C.

fish tail propeller = a propeller with a single blade that oscillates like the tail off fish when swimming.

fish tail wind = a variable wind that blows across shooting ranges.

fish tank = 1) a fish or water holding structure of varying size and construction material, from an aquarium to a large outdoor pond.

fish tank = 2) in a museum, a large, often rectangular container for storing fluid-preserved specimens. Usually of stainless steel as wood and plastic containers eventually deteriorate.

fish tank = 3) a cabinet of microfiches.

fish tank = 4) London and neighbouring areas housing projects with square windows, and a 2009 movie whose protagonists live in such a project.

fish tank granuloma = fishkeeper's granuloma.

fish tape = flexible, flat metal wire used to pull other wires through conduits or wall spaces.

fish tapeworm anaemia = a medical condition of humans, a rare form of macrocytic anaemia caused by infestation with the tapeworm *Diphyllobothrium latum*.

fish tapeworm infection = ingesting the larvae of the tapeworm *Diphyllobothrium latum* through eating undercooked fish. More common in cold, fresh lakes such as the Great Lakes. The adult worm can reach 30 feet in length in the human intestine, causing blood in the faeces (and worm segments may be visible) and vitamin B12 deficiency.

fish TB = tuberculosis (a mycobacterial infection found in aquarium fish, for example (*Mycobacterium marinum* and *M. fortuitum* are known causes.). Fish are lethargic, show little interest in food, exhibit wasting, hollow bellies, popeyes, colour loss, deformities, ulcers, frayed fins, yellow or dark nodules on the body and eyes, and secondary infections. Some fish, such as salmonids, may show no external symptoms although the disease is fatal from internal lesions. Mycobacteriosis is a zoonose, a disease capable of infecting humans, entering through skin abrasions and causing skin granulomas. Poor aquarium conditions can allow this infection to take hold. Fish can be treated with proprietary medicines for mild cases, by antibiotics but severe cases may be untreatable. The fish tank needs disinfection. Also called mycobacteriosis).

fish teind = a tithe payable in kind or cash by boats fishing from a harbour in certain parishes (Scottish dialect). See also boat teind and teind fish.

fish tester = an electronic device with electrodes which are applied to the fish just behind the head. The current properties measure freshness.

fish thistle = a Syrian thistle plant, *Chamaepeuce diacantha*.

fish ticket = record of a fisherman's landings, given him by dealer as a receipt for later payment (Newfoundland).

fish tiger = a bird that preys on fish.

fish to fry = concerns or interests to pursue, or matters to attend to (usually other fish to fry).

fish tongue = 1) long-handled tongues used for catching fish or for holding slippery or dangerous fish such as moray eels.

fish tongue = 2) a device for removing wisdom teeth, named for its shape.

fish tongue = 3) a commercial product, often marketed with fish cheeks, fresh, frozen or cured.

fish top = a movable box-like structure to cover piled cod-fish. Also called fish house and fish room.

fish torpedo = a torpedo resembling a fish in shape.

fish tote = 1) a bag designed to carry fish. Waterproof, insulated and puncture proof. May be used for transporting live fish or keeping dead captured fish in a fresh condition.

fish tote = 2) any bag or tote decorated with fish pictures.

fish track = fossilised remnants of fish moving over the bottom; traces of pectoral and other fins. Also called ichthyopatolites.

fish trap = a spring-loaded trap made of netting on a frame that closes over a fish. The two rectangular halves of the trap are spread apart from the central spring mechanism. The fish is attracted by bait or a dummy fish that the fish sought tries to fight, e.g. a wooden male salmon painted in spawning colours. See also shutter trap.

fish trap boat = herring weir seine boat (an open boat about 28 feet long with an inboard motor. Has three man crew and is used to tend herring seines, traps and weirs).

fish tremble at the sound of my name = a car bumper sticker and t-shirt slogan, presumably applied by overconfident fishermen.

fish trowel = 1) a fish slice or fish carver having a trowel shape.

fish trowel = 2) a gardener's tool shaped like a scoop.

fish trowel = 3) a tool used for smoothing a mold.

fish tub = a puncheon, *q.v.*, sawn in half, used to hold split cod in salt (Newfoundland).

fish tycoon = an online simulation or strategy game involving fish in an aquarium. The fish must be fed and maintained under appropriate (virtual) conditions. Exotic hybrids can be bred and sold in a virtual shop to buy chemicals, medicines and supplies. The fish "grow" even when the computer is off.

fish upon the gang-boards = fully loaded with cod (Newfoundland).

fish van = 1) a light spring-cart for carrying fish.

fish van = 2) a railway truck dedicated to fish transport.

fish velocity = the velocity at the location occupied by a fish, measured at the fish's snout.

fish warden = an official who enforces game laws relating to fish.

[fish wars](#) = the competition in car signs supporting or opposing evolution by using the Christian fish symbol, variously modified.

[fish wash box](#) = a container used to wash salt cod before drying on flakes, *q.v.*

fish waste = 1) fish that are caught but do not have market value as food, fish parts as a by-product of the production process. May be used for fish meal, fish oil, pet food, hatchery food, animal food, and other byproducts.

fish waste = 2) fish remains after oil has been extracted; often used as fertiliser. Also called fish pomace, fish scrap.

fish water = 1) a fixed volume of water in which a fish has been kept for a certain period. This water contains external metabolites and can be used in various experimental procedures, e.g. predator/prey interactions without the predator present (metabolite production by the predator may be suppressed when prey is present).

fish water = 2) a water body in which fish can, or do, live.

fish way = fish ladder.

fish wear = fish weir.

fish weather = overcast, chilly and damp weather in Newfoundland.

fish weed = pondweed (*Potamogeton*).

fish weight = a piece of iron used in weighing dried cod in Newfoundland.

fish weiner = a smoked fish sausage.

fish weir = 1) a dam in a river to back up water to form a fish pond; a fish garth.

fish weir = 2) a fence of stakes, brushwood, etc. for catching fish.

fish weir = 3) a draught or catch of fishes.

fish well = a storage compartment in a fishing vessel for live fish, usually in a sport fishing boat.

fish wheel = a series of lift nets on a wheel frame that is rotated by the river current, catching migrating fish and dumping them through a chute into a basket.

fish wife = 1) a woman who sells fish.

fish wife = 2) a foul-mouthed coarse, abusive woman.

fish wife = 3) the female wife or consort of a homosexual male (U.S. slang, mid-1900s onward).

fish with a golden hook = to offer bribes.

fish woman = a woman who retails fish. Also a fish wife.

fish wood = 1) Jamaican dogwood or Florida fish-poison tree (*Piscidia piscipula* (Fabaceae, pea family), also called fishfuddle tree. Not a member of the dogwood family. Seminoles in Florida used a powder made from its roots, bark, and leaves to stun fish. See also fish poison tree.

fish wood = 2) *Euonymus americana* (Celastraceae) or strawberry bush of eastern North America.

fish wire = fish tape.

fish worker = an aquaculturist.

fish works = 1) the equipment used in aquaculture.

fish works = 2) a fish factory where the products of a fishery are used.

fish worm = 1) a parasitic worm of fishes.

fish worm = 2) an earthworm used as bait in angling. Also called fishing worm.

fish worship = ichthyolatry (the worship of fishes or fish-shaped idols).

fish wrap = 1) a low quality publication, especially a newspaper, suitable only for wrapping fish.

fish wrap = 2) ephemeral printed matter, suitable only for wrapping fish.

fish wrapper = a journal, newspaper or chronicle.

fish yard = fish garth.

fish- = many words have been combined with fish as a prefix or modifier. These words may, or may not, be hyphenated or joined. All variants may need to be searched. Note that any term preceded by fish may occur alone.

-fish = many words have been combined with fish as a suffix. These words may, or may not, be hyphenated or joined and can be found under the appropriate letter heading.

fish's mouth = Fomalhaut.

fish-and-fog land = Newfoundland.

fish-attracting device = fish aggregating device.

fish-attractor = any structure placed in the water to create habitat for fishes.

fish-backed = swelling out on the upper side, convex dorsally.

fish-bagger = a suburban tradesman's term for those who live in good areas but without spending more than rent money; derisory.

fish-ball = fish don't have balls but are sometimes made into them. A ball of shredded white fish or cod and mashed potatoes, flour or other binding material, usually fried. Also called fish dumpling. See also canned fish ball, catfish ball and ball.

fish-bar = 1) fish plate (1).

fish-bar = 2) a restaurant serving fish, often sushi, with seats at a bar.

fish-barrier = weir (nets or fences set in streams or along the coast to direct fish into a holding container for easy capture. Some weirs take advantage of the falling tide to capture fish while others catch upstream migrating adults).

fish-basil = a herb, basil used in fish dishes.

fish-basket = 1) a device to catch fish moving in a stream; made of wickerwork or wooden slats and usually trapping downstream migrants.

fish-basket = 2) keepnet (a net lacking knots and supported with plastic or metal hoops, designed to hold fish caught by angling, usually in contests so the fish can later be weighed and released, or to keep fish fresh before transport and eating).

fish-basket = 3) a basket used for carrying fish; a creel.

fish-beam = a beam one of whose sides (usually the ventral one) swells out like the belly of a fish.

fish-bearing waters = lakes, streams, ponds and other water bodies that have resident fish populations.

fish-bed = a stratum rich in fish fossils.

fish-bee = a bluebottle fly (Scottish dialect).

fish-bellied = swelling out on the underside, convex ventrally.

fish-belly = anything white like a fish belly including certain plants where leaves are white on the underside and turned up in the wind.

fish-belly sill = a side or central sill used in railroad car construction; named for its fish shape.

fish-berry = a plant used to kill or stupefy fish when placed in water as an extract, e.g. Levant berry (*Cocculus indicus* (an older name) or *Anamirta paniculata*) crushed and scattered on the water surface by Indian fisherman.

fish-bladder = 1) the storage sac for urine.

fish-bladder = 2) a figure composed of two equal and symmetrically placed circular arcs. See also vesica piscis.

fish-bladder = 3) gas bladder (a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, sound receptor, respiratory organ. Found in Actinopterygii. Often lacking in bottom fishes. Sometimes called swim bladder or air bladder, less appropriate terms).

fish-block = 1) a block of frozen fish flesh, containing no skin and no bones.

fish-block = 2) equipment to raise the flukes of an anchor to the gunwale. Also called fish tackle.

fish-block = 3) a mechanism used with fish-tackle for raising heavy objects. Consists of a wheel with a groove in which a rope can run to change the direction or point of application of a force applied to the rope.

fish-blooded = cold-blooded, in reference to people.

fish-boat = a boat from which fish are caught.

fish-boil = 1) a mass of fish attacking food or bait just below the surface. Also called boiling school.

fish-boil = 2) fish, potatoes and onions boiled in salted water, usually at a picnic.

fish-boiler = 1) a fish kettle.

fish-boiler = 2) a Norwegian (slang).

fish-bolt = a bolt used to fasten fish plates and rails together.

fish-bombing = a home-made bomb made from an empty glass bottle filled with fertiliser and kerosene used to stun fish on coral reefs for capture and sale in the aquarium trade.

fish-bone beard lichen = a lichen, *Usnea filipendula*, with antibiotic properties, widely used since ancient times. Its fibrils have been likened to a fish-bone appearance.

fish-bone diagram = a graph used in quality control to identify possible problem causes.

fish-bone stitch = a series of diagonal, single-purl stitches zig-zagged across an unmarked line.

fish-bone thistle = fish thistle.

fish-bone tree = *Panax crassifolium*, a small tree from New Zealand.

fish-bones = oscillations in soft x-ray emissions which have the appearance of fish bones.

fish-bowl = 1) a round glass bowl used for keeping ornamental or pet fish.

fish-bowl = 2) a situation where one's activities are constantly observed, scrutinised, commented on, etc.

fish-bowl = 3) jail.

fish-bowl granuloma = localised nodular skin inflammation (small reddish raised areas of skin) caused by the bacterium *Mycobacterium marinum*. Usually acquired by occupational or recreational exposure to salt or fresh water, often resulting from minor trauma during caring for aquaria.

fish-box = a box for storing and transporting fish, usually 15-50 kg.

fish-brain = in inline skating a slide where the skater grabs one skate with the hand closest to it.

fish-breast = a plump fillet.

fish-breath = halitosis in cats eating a diet of fish.

fish-brine = fish sauce.

fish-broth = water (slang).

fish-burger = a hamburger with the patty made from fish.

fish-cadger = fish-hawker (Scottish dialect).

fish-cake = 1) fish flesh mixed with potatoes, seasoning and sometimes eggs, butter and onions and formed into cakes or patties and fried in fat. Fish content may be 35-50% by weight and include such species as cod and haddock. Marketed cooked, cooked and frozen, frozen ready for frying, and canned.

fish-cake = 2) fish before drying in the manufacturing process for fish meal.

fish-camp = a camp used as a base for angling by a group of people; may be very simple or have accommodation and other facilities.

fish-canning capital of the world = title given to Stavanger, Norway.

fish-capture channel = a channel dug in the bottom of a fish pond where fish concentrate and are more easily caught when the pond is drained.

fish-car = a railroad car with water tanks for transportation of live fish.

fish-carle = a fisherman.

fish-carrier = 1) a boat used to transport a catch of fishes from a vessel to the shore.

fish-carrier = 2) a container used to keep fish alive during transportation.

fish-carver = a carving knife used for fish. May be paired with a fork.

fish-cask = a wooden barrel for the export of dried and salted cod (Newfoundland). See also fish-drum.

fish-catching box = a fry trap placed behind the monk, *q.v.*, to catch fish when a pond is drained.

fish-catching-with-thighs = fish were reportedly so abundant around Easter Island that they could be caught by squashing them between the thighs of swimmers. A locality on the island has this name.

fish-census = a survey over time of fish species, numbers and relative abundance.

fish-chip = a delicatessen potato chip-like product made of equal parts of fish and potato.

fish-chorusing = sound production in fishes associated with reproduction. Various websites have recordings of the sounds made.

fish-chowder = a thick soup mix of cooked fish and/or shellfish and potatoes in a broth made from pork, flour, seasonings and fish stock.

fish-clamp = a type of fish spear with several prongs that hold a fish without excessive injury. The prongs may be pointed and barbed too but the purpose of the clamp is to secure the fish with little damage.

fish-cleaning station = a facility providing running water, tables and waste disposal for anglers to clean their catch.

fish-climber = a plant (see fish-berry) whose red and black-kernelled beans when bruised and thrown into water will stupefy fish.

fish-clip = fish clamp.

fish-club = 1) a device used to stun or kill a fish when captured on hook and line or in a trap. Can be a simple piece of wood or intricately shaped and carved as with the Haida fish clubs of western Canada.

fish-club = 2) an association of individuals devoted to angling. See also anglers association.

fish-club = 3) an association of individuals devoted to keeping fish in aquaria.

fish-cocktail = ceviche (raw white fish marinated in lemon or lime juice and served with sweet limes, avocados, onion rings, garlic, cilantro, chilies, boiled corn and tomatoes. Originally from Peru, variously modified).

fish-collecting pool = a place where fish concentrate during the drying up or draining of a pond, usually behind the monk, *q.v.*

fish-content = the amount of fish in a product, often given as a percentage and minimum amounts required by law, e.g. in fish spread and cakes.

fish-coop = 1) a wicker basket for catching fish.

fish-coop = 2) a box about a metre square used in fishing through ice.

fish-coop = 3) a large trap net made of stakes or a fence.

fish-coop = 4) abbreviated form of fish cooperative.

fish-cooperative = a jointly owned organisation furthering the catch, processing and sale of fish. Abbreviated as fish-coop (pronounced co-op).

fish-corral = barricade (a barrier used to lead fish into an enclosure, e.g. fyke net, pound net, etc).

fish-court = the holding chamber in a trap net or the last chamber in any net.

fish-credit water = water set aside in reservoirs for release downstream to maintain fish stocks.

fish-crisp = a delicatessen product made from fish mince mixed with starch and sugar, expanding when cooked in oil and not like a potato chip.

fish-crop = yield (1) catch in weight. Catch and yield are often used interchangeably. Amount of production per unit area over a given time. A measure of production. The sustainable yield is the quantity of fish which can be taken from a stock (usually on an annual basis) without severely depleting or eliminating that stock).

fish-crow = a species of crow (*Corvus ossifragus*) in eastern North America feeding mostly on fish, usually dead fish.

fish-culture = the artificial breeding and raising of fish.

fish culturist = a person engaged in aquaculture.

fish-curing = drying, salting, smoking and pickling of fish to extend their edibility.

fish-currie = a small stool used by fishermen (Scottish dialect).

fish-dance = a dance of Great Lakes Indians involving flipping motions of the hands and feet.

fish-davit = a crane-like device for raising or lowering equipment such as an anchor using a fish fall.

fish-day = a day on which fish is eaten according to religious requirements; a fast day.

fish-decoy = an imitation of a fish used to attract fish close enough to be speared. Used in ice fishing in North America.

fish-dive = a ballet position where the dancer arches her back, lifts her head and bends back her legs with feet crossed. This position may be maintained while jumping or while supported, hence the name.

fish-diverter = an electrical device that prevents fish from entering sensitive areas, e.g. power dams.

fish-dog = an experienced fisherman (Newfoundland).

fish-drawn = eviscerated fish.

fish-drum = a drum-shaped wooden container for shipping dried cod (Newfoundland).

fish-duck = any species of merganser.

fish-dumpling = fish ball.

fish-eagle = osprey (*Pandion haliaetus*) or any eagle feeding on fresh fish or fish as carrion such as *Haliaeetus*.

fish-ear = an incorrect or slang term for the gills.

fish-eater = 1) one who lives chiefly upon fish.

fish-eater = 2) a Roman Catholic; derogatory based on consumption of fish on Fridays.

fish-eater = 3) a knife and fork used in eating fish (British).

fish-eating bat = fishing bat.

fish-eating spider = the fen raft spider (*Dolomedes plantarius*) of Europe is known to catch small fishes such as sticklebacks. It dangles its front legs in the water from a plant to detect the vibrations of approaching prey.

fish-eye = 1) an eye like that of a fish.

fish-eye = 2) a wide-angle lens on a camera covering about 180°.

fish-eye = 3) a weld defect having a hole or piece of matter surrounded by a circular area of brightness.

fish-eye = 4) a diamond or other gem cut too thin for proper brilliance.

fish-eye = 5) a variety of moonstone.

fish-eye = 6) an imitation diamond.

fish-eye = 7) a small blemish in finished paper caused by a crushed and glazed particle.

fish-eye = 8) a cold or suspicious stare.

fish-eye = 9) blank, expressionless.

fish-eye = 10) ocular lymphomatosis in fowl.

fish-eye = 11) in oil drilling fluids, slang for a globule of partly hydrated polymer formed by poor dispersion during mixing. About 0.2-0.5 inches in size, they consist of a granule of unhydrated polymer covered by hydrated polymer and so are impervious to water and do not disperse.

fish-eye disease = an inherited disorder in humans resulting in low HDL cholesterol and corneal opacity.

fish-eye stone = apophyllite, a general term encompassing three minerals.

fish-eyes = slang for tapioca pudding.

fish-face = 1) someone having a face reminiscent of a fish, although not necessarily having any features particularly fish-like.

fish-face = 2) a term of abuse, sometimes used affectionately. Refers to an open mouth like a gaping fish and a blank expression, indicative of lack of brain function.

fish-fag = female fish monger.

fish-fall = 1) the tackle depending from a fish davit used in hauling up the anchor to the gunwale.

fish-fall = 2) rains of fishes (fishes falling from the sky like rain or in rain, the result of waterspouts and whirlwinds (see account by Gudger (1921))).

fish-farm = an aquaculture facility.

fish-fast = the observance of a fish day.

fish-feed = commercial fish food, often in pellet form and based on fish oil and fishmeal.

fish-fence = any structure made of wood, brushwood, mats, etc. used to catch or direct fish into traps. These may be in the form of a net narrowed inward to prevent fish finding the entrance again, to elaborate labyrinths. The general base form is triangular or heart-shaped, with complex fencing and multiple base forms in a labyrinth.

fish-finder = 1) a sonar device or echo sounder used to locate fishes and determine water depth.

fish-finder = 2) a surf-fishing rig comprising a pyramid-shaped sinker running freely along the line; this allows the bait to be carried by the tide or run by a fish.

fish-finger = fish stick.

fish-flake = a rack on which fish are dried, often of spruce boughs on a framework of poles in North America.

fish-flakes = cooked haddock or cod flesh broken up into flakes and then canned.

fish-flee = a bluebottle fly (Scottish dialect).

fish-flop = a somersault involving flipping feet in the air.

fish-flour = a flour made of pulverised, dried fish parts.

fish-flows = artificially increased flows in a river system instituted to move young fish quickly downstream during their spring migration period.

fish-fly = 1) a large, soft-bodied insect found near streams with aquatic larvae called hellgramites used as fish bait (Corydalidae, Megaloptera).

fish-fly = 2) the rove beetle (*Staphylinus villosus*) which swarmed in older fish processing sheds. Also called fish beetle.

fish-food = the food eaten by fishes, cf. fish-feed.

fish-fork = 1) a large, short- to long-handled fork used in unloading fish. With one or two tines.

fish-fork = 2) a 4-tined fork used in eating fish, larger than a salad fork.

fish-fosh = a Cockney term for kedgeree; a reduplication of the word fish.

fish-front = fish (9) a piece of timber used to strengthen a mast or spar when sprung, often somewhat fish-shaped).

fish-fry = 1) an indoor or outdoor party where fish and seafoods are cooked and eaten.

fish-fry = 2) fried fish.

fish-fry = 3) fry or young fish.

fish-fuddle = fish-fuddle tree.

fish-fuddle tree = *Piscidia piscipula* (Fabaceae, pea family), also called Jamaican dogwood, Florida fish-poison tree and fishfuddle tree. Seminoles in Florida used a powder made from its roots, bark, and leaves to stun fish. See also fish poison tree.

fish-fungus = 1) an aquatic fungus (*Saprolegnia* spp.) that attacks living fish in crowded conditions such as aquaria and aquaculture facilities.

fish-fungus = 2) a reddish fungus (*Clathrocystis roseopersicina*) found on salted cod.

fish-gaff = a long pole with a metal hook on the end, used to secure large fish caught on hook-and-line and haul them on board a vessel.

fish-garth = a dam or weir in a river for keeping or catching fish.

fish-gate = a gate in the walls of ancient Jerusalem where the fisherman of Galilee would bring in their catch.

fish-gel = surimi, *q.v.*, with salt added and heated to 90°C and called kamaboko.

fish-gelatin = isinglass (the glutinous or gelatin-like fluid prepared from the collagen of the outer layer of gas bladders of sturgeons or other fishes. Used in clarifying wines and beers, for jams and jellies, in printing inks and as an adhesive cement).

fish-gig = 1) a pole with barbed prongs for striking fish. Loaded at the end with lead.

fish-gig = 2) an arrangement of hooks dragged through the water to foul-hook fish.

fish-globe = a spherical glass container for keeping pet fish.

fish-glue = 1) isinglass (the glutinous or gelatin-like fluid prepared from the collagen of the outer layer of gas bladders of sturgeons or other fishes. Used in clarifying wines and beers, for jams and jellies, in printing inks and as an adhesive cement).

fish-glue = 2) a liquid glue made from the bones, fins and skin of fish by heating in water, used cold for bookbinding, for example.

fish-god = 1) Atargis (Dagon, the fish god of the Philistines, the upper half being a man and the lower half a fish. The fish half represented fertility).

fish-god = 2) Dagon (the fish god of the Philistines, the upper half being a man and the lower half a fish. The fish half represented fertility. The name is from the word dag, meaning fish. The Babylonians had a myth of a being who emerged from the Erythraean Sea, being part fish and part man. Also found in Assyrian sculpture).

fish-god = 3) Ea (a Sumerian fish god living in a submarine palace. See also apkallu fish).

fish-god = 4) Fuxi, (the Chinese amphibious god, a founder of their civilisation, with a man's or woman's head and a fish tail).

fish-god = 5) Oannes (the foremost of the the fish men who brought civilisation to the Babylonians. Lived on land during the day but had to return to water at night. Became the fish god Dagon later).

fish-god = 6) Oe (Oannes).

fish-god = 7) Triton (a merman, the son of Poseidon and Amphitrite, human above the waist but fish-shaped below. Known as the trumpeter of the sea since he blew on a conch).

fish-god = 8) Vishnu (Mahavishnu took the form of a fish to retrieve the vedas from the Asura Hayagreevan (head of a horse) and also to safeguard herbs and seeds at the end of one cycle of creation).

fish-goddess = Hat-Mehit (a goddess from Mendes in Lower Egypt in charge of the the rare fish cult, depicted as human with a fish over her head or as a fish).

fish-gorge = an old piece of fishing gear comprising a short piece of wood, bone, horn, flint or metal, variously shaped, but having sharp ends, usually a central attachment for the line, and embedded in bait. When the fish swims away, having swallowed the baited gorge, it lodges crosswise in the throat. Variants have line attached at one end and the other end pointed, a cross-shape that spreads open when the line is pulled, and the spring-gorge or spring-angle, q.v.

fish-grained split = a book binding of a sheepskin split, dyed and embossed with a gunpowder grain.

fish-grass = water shield or fanwort (*Cabomba caroliniana*), an aquatic plant of North America.

fish-gravy = fish sauce, e.g. Thai fish sauce.

fish-gription = the ability to hold a slippery fish long enough to take a photograph (slang).

fish-guano = fertiliser made of fish; or fish manure.

fish-guide = 1) any device used to direct fish to a certain place for capture or avoidance of danger, e.g. lights, bubbles, sound, electricity.

fish-guide = 2) a professional fishing guide who directs the angler to spots where trophy fish can be found and advises on tackle to catch them. See also ghillie.

fish-gunners = the Royal Marine Artillery, the implication being that all they hit was fish.

fish-hair = synthetic hair used in tying streamers (q.v.) and saltwater flies.

fish-ham = tuna or marlin flesh mixed with whale and pork in a sausage (Japan).

fish-handler's disease = erysipeloid, a dermatitis from handling fish contaminated with bacteria.

fish-handling = operations such as growing, harvesting, processing, packing, storing, transporting, distributing, marketing and selling of fish.

fish-hatchery = a place or establishment for spawning, incubating and hatching fish eggs and for the rearing of young for release into the wild.

fish-hawk = osprey (*Pandion haliaetus*).

fish-hawker = a seller of fish, usually by travelling about and calling out his wares.

fish-head = 1) an apparatus for withdrawing the clacks of pumps through the column.

fish-head = 2) slang for naval officers, World War II.

Fish-Head Hall = a wing of the Royal Naval Engineering College at Manadon, Plymouth where the specialty was marine engineering.

fish-head music = the type of music played by the Radiators, a rock band from New Orleans, which combines local music with mainstream rock and rhythm and blues. Fans call themselves fishheads and the band often has fish-related themes in their work.

fish-hedge = a trap made of bamboo screens.

fish-hold = an enclosed space on a vessel for storing fish; may be insulated and/or refrigerated.

fish-hood = the state or condition of fish (rarely used).

fish-hook = 1) a bent piece of wire with its tip sharpened and often a barb below the tip used to catch fish. Available in many sizes and styles. May be single, double or treble but all these are counted as one hook in angling regulations. Hooks separated by stretches of line are counted as multiple hooks. See hook.

fish-hook = 2) a large hook with a pendant to which the fish tackle is hooked in fishing an anchor.

fish-hook = 3) a sharp broken strand in a wire.

fish-hook cactus = cholla cactus (*Opuntia* spp.) or barrel cactus (*Ferocactus wislezenii*) of the American southwest with hooked spines.

fish-hook displacement = a medical condition in humans where the stomach is displaced. The orifice of the pylorus faces directly upward and the duodenum runs upward and to the right to join the pylorus at an angle, producing a constricting hook. Asymptomatic.

fish-hook facelift = a process involving small hooks embedded in the face under the skin to lift up loose flesh around the jaw and tighten the face skin (the Endotine ribbon facelift). The hooks dissolve after a few months.

fish-hook flea = a crustacean (*Cercopagis pengoi*, Cladocera) from the Black and Caspian seas now introduced to North American lakes. Their tails are long, spiny and shaped like a fish hook and they hook themselves together, clogging fish nets and lines.

fish-hook lift = similar to the fish-hook facelift but the hooks stay put (the thread lift).

fish-hook money = Persian larin money, scimitar-shaped.

fish-hook wire = a wire of twisted strands with a piece of wire resembling a fish hook inserted at intervals.

fish-hooked wire = fish-hook wire.

fish-hooks = 1) fingers (slang).

Fish-Hooks = 2) Ficheux, a village in northern France, World War I slang.

fish-hooks in one's pocket = to be very cheap. From Samuel Mulford who sewed fish hooks in his pockets on a visit to London in the eighteenth century to avoid pickpockets.

fish-hoop = a structure on a mast on which the lower end of a fish (a strengthening piece of wood in a fish shape) is driven.

fish-horn = 1) a tin horn that was used by fish sellers or on fishing boats.

fish-horn = 2) a soprano clarinet or saxophone, Canadian slang.

fish-house = 1) a building where fish are stored or processed. Also called fish-room.

fish-house = 2) a restaurant serving or specialising in fish and seafood.

fish-house = 3) a building from which fish are sold.

fish-house = 4) fish top (a movable box-like structure to cover piled cod-fish. Also called fish room).

fish-house punch = a punch made of rum and brandy and water or tea sweetened with sugar syrup. Developed at the Fish House Club, formed in 1732 by a group of anglers who fished for perch on the Schuylkill River.

fish-hut = a small, moveable shack placed over a hole in the ice in winter to protect the fisher from the elements. May be heated and have other facilities.

fish-in = illegal fishing by a group to protest regulatory restrictions.

fish-insect = silverfish, a primitive, wingless thysanuran insect with a body covered in silvery scales, commonly found in houses, e.g. *Lepisma saccharina*.

fish-iron = a fish spear made of iron and having 5, 7 or 12 points.

fish-joint = 1) a joint formed by fitting a wedge into a v-slot or a w-slot.

fish-joint = 2) a joint where two abutting units are held together by a fish plate, *q.v.*

fish-keeper = may mean either pondkeeper, *q.v.*, or aquarist *q.v.*

fish-keeper's granuloma = an infection in humans with the bacteria causing fish tuberculosis (a *Mycobacterium*, but not the same as the one causing human tuberculosis). It is probably the only zoonosis of note to aquarists. It appears as a skin infection, usually on the hands or forearms where there was an earlier cut, and may be inflamed, suppurating, encrusting and irritated. Not usually serious unless the infected individual is already immuno-suppressed. Treatment requires antibiotics. Also called fishtank granuloma.

fish-kettle = a long kettle for boiling fish whole, often with a removable grid so the fish can be removed in one piece without it falling apart.

fish-kill = a die off of fishes within a relatively short period due to the onset of man-caused or, more rarely, natural factors, e.g. pesticide related mortalities, red tides, drought. See also winterkill and summerkill.

fish-killer = an aquatic insect of the family Belostomatidae, e.g. *Lethocerus americanus*, which feeds on small fishes. Also called toe-biter.

fish-killer tree = a member of the brazil nut family, Lecythidaceae, *Barringtonia asiatica*, containing saponins in the leaves which are ground and thrown into water to paralyse fish.

fish-king = a legendary king of fishes who, if caught and released, gratefully directs fish into the nets of fishermen.

fish-knife = 1) a small knife with an ornamental upper edge used in eating fish along with a fork.

fish-knife = 2) a large knife with an ornamental upper edge and a broad blade used in serving fish with a large fork.

fish-ladder = a series of steps with flowing water and pools enabling a fish to circumvent an obstruction such as a dam or waterfall by leaping from step to step. Also called fishway, fish pass.

fish-lead = a type of sounding lead used without being removed from the water between soundings.

fish-leather = treated fish skin used in garments, shoes, handbags, belts, jewellery, briefcases, wallets and novelty items.

fish-leaves = the floating leaves of the common pondweed (*Potamogeton natans*), or the plant itself, said to shelter fish.

fish-leech = an annelid worm with some members parasitic on fishes, notably *Piscicola*. Rarely causes much damage but can transmit blood parasitic protozoans and possibly bacteria and viruses, as well as causing secondary infections. May cause anaemia, lethargy and restlessness. Rare in aquaria but common in fish ponds and in the wild.

fish-leep = a fish basket.

fish-lice (singular louse) = parasitic crustaceans on marine and freshwater fishes. The common ectoparasite is *Argulus* (Branchiura) which can move around on its host, causing several wounds. May result in lethargy, loss of appetite, anaemia through blood loss, osmotic stress and secondary infections. The effects of irritation are restlessness, darting, jumping, scratching and overproduction of mucus. Various chemical treatments of aquarium water will remove the parasite although they are often large enough to be picked off with tweezers as long as a topical antiseptic is applied to the wound site.

fish-lift = fish way.

fish-like = like fish, suggestive of fish; having some of the qualities of fish.

fish-line = a line made of twisted hair, silk, monofilaments or other material used in angling.

fish-lip = to slobber on the end of a marijuana cigarette.

fish-liquor = the liquid in which fish have been boiled.

fish-liver oil = oil extracted from fish livers (cod, halibut, sharks) and used industrially or as a source of vitamins A and D.

fish-liver paste = fish liver ground up with salt, spices and other flavouring ingredients.

fish-lock = 1) a fish weir, in the sense of a dam forming a retaining reservoir harbouring fishes.

fish-lock = 2) a lock which allows fish to swim upstream bypassing a weir or other obstacle, sometimes with the aid of a fish ladder.

fish-loft = the area of a fishing stage, *q.v.*, where dried cod are stored.

fish-lore = study of fishes; ichthyology.

fish-louse = any crustacean parasitic on fishes. Usually refers to *Argulus* (Branchiura) found on the skin and occasionally the buccal cavity. Causes ulcers at the attachment point.

fish-magnet = a moveable electrode used to bring up a school of fish that normally is too deep for a purse seine to catch.

fish-maker = a person curing cod on flakes (*q.v.*) in Newfoundland.

fish-man = 1) a person cleaning fish as food.

fish-man = 2) a seller of fish.

fish-man = 3) a fisherman.

fish-man = 4) a student of ichthyology.

fish-manure = dried and powdered fish used as fertiliser in fish ponds to enhance productivity.

fish-market = 1) any area selling fish but usually refers to a large covered establishment with diverse products. Famous fish markets include Billingsgate (London), Tsukiji (Tokyo) and Fulton (New York), all *q.v.*

fish-market = 2) the lowest hole at bagatelle.

fish-market = 3) a brothel.

fish marking = a system involving various methods (fin clipping, colouring, biotelemetry, radioactive markers, tattooing, branding, tagging, etc.), used for individual identification and for studies on movement, growth and other biological parameters.

fish-martingale = a large jigger, the double block secured to one of the bolts in a davit head or the single block hooked down to a bolt in the ship's side.

fish-maw = the dried stomach or swim bladder of a fish used for industrial purposes.

fish-meal = dried fish or fish waste used as fertilizer, animal food or ground fine for use in soups. May be defatted, and is powdered or granular in form.

fish-meter = an officer of the Fishmongers Company.

fish-mill = a circularly swimming mass of fishes, usually formed only by obligate schoolers.

fish-mint = aquatic or moist-growing mints (*Mentha aquatica* and *M. longifolia*).

fish-mite = a parasite infesting salt fish.

FISH-mode = FISH queue.

fish-mold = a water mold growing on fish (saprolegniasis, a fungal infection from *Saprolegnia* and *Achlya*, usually a secondary infection after skin damage or scale loss but also affecting eggs in hatcheries).

fish-money = a bounty for a certain number of fish caught.

fish-monger = 1) a dealer in or seller of fish.

fish-monger = 2) a bawd, presumably a corruption of flesh monger, dating from the mid-sixteenth century.

fish-monger = 3) a pimp (slang since the 1500s).

fish-monger = 4) a lecher or whoremonger (1800s Britain).

fish-monger's daughter = a whore; slang from late sixteenth century.

fish-moth = silverfish and fire brats, insects found in houses and having silvery scales.

fish-mousse - a mousse made with fish.

fish-mouth = 1) turtlehead, a perennial North American herb (*Chelone glabra*).

fish-mouth = 2) an opening at the exposed edge of a roofing ply sheet where the asphalt bond is lacking or the felt is wrinkled.

fish-mouth incision = a wide and horizontal incision made on the tip of the finger to drain an abscess.

fish-mouth meatus = a medical condition in humans; a red and swollen and everted condition of the orifice of the urethra (meatus) in the first stage of acute gonorrhea.

fish-mouth stenosis = an extreme medical condition in humans describing the narrowing and ineffective opening of the mitral valve of the heart.

fish-net = 1) any net used to catch fishes.

fish-net = 2) any material having the open mesh pattern of a fishnet, e.g. women's stockings.

FISH-net = 3) nothing to do with fish; computer slang for "first in, still here" referring to slowed or stopped processes, in this case on a network.

fish-net = 4) the shape of the city of Wung-chun, China, laid out in this shape to be viewed from above. See also carp.

fish-net buoy = a buoy marking the limit of fish net.

fish-nuggets = fish pieces formed into small irregular shapes, breaded and served fried.

fish-o = fisho.

fish-odour = a genetic disorder giving a rotting fish odour to a person's breath, urine and sweat. Caused by lack of an enzyme that would process an odour-causing protein, trimethylamine. Also called fish-odour syndrome.

fish-odour syndrome = fish-odour.

fish-offal = fish waste.

fish-oil = any oil obtained from fishes, usually from the liver, but in fatty fishes from the body, or from fish wastes. Used in fish feeds, edible fats, soaps, paints, leather work and making linoleum.

fish-out = 1) exhaustion of the fish supply in a water body; to denude an area of fish.

fish-out = 2) to remove an object from a receptacle or from water.

fish-out pond = a natural or artificial pond stocked with fish that anglers can take for a fee.

fish-out-of-water = a variant of the pool game Marco Polo, where one person is "it", swims around with eyes closed, and tries to tag another player, sensing their presence by sound. However "it" can yell "Marco" to which the other players must respond "Polo", revealing roughly where they are. A tagged player becomes the next "it". The fish-out-of-water" variant allows the non-"it" players to get out of the pool to avoid being tagged but if "it" yells "fish-out-

of-water" then the person out of the water becomes "it". If more than one person is out of the water, "it" chooses the next "it". See also sharks and minnows.

fish-owl = a fish-eating owl of the Old World genera *Scotopelia*, *Bubo* and *Ketupa*. Pel's fishing owl, *Bubo peli*, of Africa, is said to make the sound of "a lost soul falling into the bottomless pit".

fish-paper = 1) vulcanised cotton fibre used for electrical insulation.

fish-paper = 2) paper on which cooked fish is laid, presumably waxed.

fish-pass = 1) fish passage facility.

fish-pass = 2) a cut dredged through a barrier island allowing tidal flushing and movement of fish.

fish-passage centre = a centre that plans and implements an annual smolt monitoring program, developing and implementing flow and spill requests; and monitoring and analyzing research results to assist in implementing a water budget.

fish-passage efficiency = the proportion of juvenile fish passing a project through the spillway, sluiceway, or juvenile bypass system, as opposed to passing through the turbines.

fish-passage facilities = features of a dam that enable fish to move around, through, or over without harm. Generally an upstream fish ladder or a downstream bypass system.

fish-paste = fish mixed with salt and ground to a fine consistency with or without added fat, spices and other seasonings. Should contain 70% or more fish. Used as a sandwich spread.

fish-paunch = fish (9) a piece of timber used to strengthen a mast or spar when sprung, often somewhat fish-shaped).

fish-pea = a small part of the cod intestine, consumed as a delicacy in Newfoundland.

fish-pearl = a glass bead coated with essence d'Orient, q.v., to make an artificial pearl.

fish-pen = 1) an enclosure in the water for aquaculture made of netting on a frame; it serves to keep desired fish in and unwanted species out.

fish-pen = 2) a wooden bin for salting cod in Newfoundland.

fish-pendant = a large block hanging from the end of a davit.

fish-pest = any deadly epidemic disease of fishes.

fish-pie = fish, minced and baked with potatoes, and sometimes mixed with vegetables, in a pastry.

fish-piece = fish (9) a piece of timber used to strengthen a mast or spar when sprung, often somewhat fish-shaped).

fish-pier = a pier for fishing boats to tie up at.

fish-pile = a stack of split and salted cod at various stages of the drying process (Newfoundland).

fish-pipe = the oesophagus of a seal (Newfoundland).

fish-plate = 1) one of the plates of a fish joint, *q.v.* Strengthens a joint by overlapping, e.g. a flat piece of metal connecting railway rails to the ties or connecting pieces of masonry.

fish-plate = 2) the perforated drainage grid of a fish kettle, *q.v.*

fish-poison = 1) usually any plant which is poisonous or intoxicating to fish, causing them to float to the surface for capture.

fish-poison = 2) *Lepidium piscidium*, a cress found on Pacific islands and formerly eaten as a relish and antiscorbutic by seamen.

fish-poison bark = Florida fish-poison tree.

fish-poison tree = various trees come under this heading as parts are used to poison fish, e.g. *Acacia ditricha* (family Mimosaceae), the leaves of which are poisonous to fish when rubbed in a bag until a soapy foam comes out (Australia), and various *Piscidia* species (Leguminosae) such as *P. mollis* where leaves are used (southwest United States and Mexico).

fish-poison wattle = *Acacia holosericea*, the leaves of which are poisonous to fish when rubbed in a bag until a soapy foam comes out (Australia).

fish-poisoning = 1) use of a chemical spread on water or added to a bait to poison fish and facilitate capture. Natural (plant-based) fish poisons include crow's eyes (seeds of *Nux vomica* containing strychnine), common yew (leaves of *Taxus hoccata*) (effectiveness disputed), juniper, cyclamen (tuber sap of *Cyclamen europaeum*), common daphne (boiled blossoms of *Daphne mezereum* containing saponin), spurge (*Euphorbia esula*), ox-tongue (leaves and roots of *Anchusa officinalis*), thornapple (*Datura chamonium*), tobacco (*Nicotiniana*) common henbane (*Hyoscyamus niger*) and mullein (boiled blossoms of *Verbascum*), among others. See also fish-seed and rotenone.

fish-poisoning = 2) illness caused by eating poisonous fishes, *q.v.*

fish-pole = fishing rod.

fish-pomace = fish remains after oil has been extracted; often used as fertiliser. Also called fish scrap, fish waste.

fish-pond = 1) a freshwater pond in which fish are kept.

fish-pond = 2) an enclosed or gated coastal body of water used in aquaculture, e.g. in Hawaii for milkfish and bonefish. Fish enter on tides, through a gate or are stocked.

fish-pond = 3) the sea (jocular).

fish-pond = 4) a depression in a card table where fish-shaped counters are kept.

fish pond = 5) an attraction at a fair where miniature fishing gear is used to hook fish-shaped tokens from a small pool to win prizes.

fish-pond = 6) the female genitalia (U.S. slang mid-1900s).

fish-pool = fishpond, a pool containing fish.

fish-portion = a piece of a wet fish of specified uniform weight or size (about 2 cm thick) cut from a fillet, or a piece of a frozen fish usually rectilinear and of specified size and weight cut from a block of frozen fish flesh; wider than a fish stick or of a different shape.

fish-pot = 1) a portable cage-like trap which fish enter through a small opening and from which they cannot readily escape because of the funnel shape. May be baited or not, made of various materials, of various sizes and shapes, and of various local names from country of use or species of capture, e.g. eel pot, Scottish creel. Used to catch crabs, lobsters and occasionally fishes.

fish-pot = 2) a junk fishing boat.

fish-potter = a person in charge of, or uses, fish pots (1).

fish-pound = 1) a net or fence set in streams or along the coast to direct fish into a holding container for easy removal. Also called trap net or setnet.

fish-pound = 2) a wooden container in which cod are placed for curing in Newfoundland.

fish-pox = carp pox (one of the oldest known fish diseases found in cultured carp, other cyprinids, pike-perch and aquarium fishes. It is caused by *Herpesvirus cyprini*. Also known as carp papillomatosis, epithelioma papulosum, fish pox, cyprinid herpesvirus I (CHV). Skin lesions appear as the water temperature drops in winter as small milky-white spots that merge and cover large skin areas).

fish-prong = fish fork (1).

fish-protein concentrate = a flour comprised of dried and powdered fish used as a food supplement. It is odourless, tasteless and has more protein than in the original fish flesh. Abbreviated as FPC.

fish-proud = a self-satisfied person on account of a large or profitable catch of fish (Newfoundland).

fish-pudding = fish ball.

fish-pump = a mechanism for transferring large volumes of relatively small fish in water from a net into a ship by means of a pump and associated flexible pipes.

FISH-queue = nothing to do with fish; computer slang for "first in, still here" referring to slowed or stopped processes. See also FISH mode and FISHnet.

fish-raceway = concrete, elongate and rectangular fish-rearing unit generally associated with a hatchery which has a large volume of flowing water, able to sustain greater fish densities than ponds, and able to maintain a cleaner environment. Used particularly for trouts, and less often catfishes. May be 100 mm long, 1-10 m wide and 0.5-1.5 m deep and made of concrete (usually), brick, tile, earth or lined with plastic.

fish-rake = a set of hooks attached to a structure such as an iron bar up to 8 metres wide towed behind a boat and impaling any fish encountered.

fish-range = a place for catching and drying fish.

fish-rearing = cultivation and propagation of fishes.

fish-room = 1) fish hold (an enclosed space on a vessel for storing fish; may be insulated and/or refrigerated).

fish-room = 2) a piece of land by the shore from which a fishery was conducted in Newfoundland.

fish-room = 3) the stages. *q.v.*, flakes, *q.v.*, stores, crew and family housing, and other facilities where a fish catch was landed and processed in Newfoundland.

fish-room = 4) a small building for storing dried and salted cod in Newfoundland.

fish-room = 5) fish top (a movable box-like structure to cover piled cod-fish. Also called fish house).

fish-rope = fish fall.

fish-royal = sturgeons, whales, dolphins and porpoises are termed this. If caught within three miles of the coast of the United Kingdom, they belong to the Crown.

fish-run = a group of fish migrating up a river, usually for spawning.

fish-salad = cooked, marinated or salted fish that is chopped or diced and added to salad.

fish-sanctuary = a place or time where/when fishing is not allowed to protect the stocks or species; for fish to spawn, rear young or rest.

fish-sauce = various fish species have been used in fish sauces, e.g. and *q.v.* cut lunch herring, fermented fish sauce, fish sauce, garum, ketchup, liquamen, milt sauce, moochim, muria, mustard herring, etc. Often used for an oriental spicy condiment or flavouring made from

salted and fermented anchovies or other fish, including nam pla (Thai), nuoc nam (Vietnamese), patis (Philippines) and shottsuru (Japanese). These sauces are pungent and strong-flavoured.

fish-sausage = fish flesh, such as tuna, ground with fat, seasoning, spices and sometime a filler such as cereal and encased in a skin. May be cooked or smoked before or after encasing.

fish-scale = 1) any pattern or design resembling fish scales. See fish scales.

fish-scale = 2) a fish's scale.

fish-scale = 3) slang for uncut cocaine.

fish-scale disease = ichthyosis (a congenital skin disease in humans where the epidermis becomes hard, rough and scaly. Also called fishskin disease).

fish-scale gallbladder = a gallbladder with a fish scale-like appearance due to multiple small cysts of the mucosa.

fish-scale tile = a tile shaped like a fish's scale.

fish-scales = 1) a grain pattern in leather resembling the scales of a fish. Once used by bookbinders who wanted a leather giving the effect of being blind tooled.

fish-scales = 2) a scale pattern on the bottom of waxless skis which helps prevent the skis from sliding backwards.

fish-scope = the cathode ray tube element of a fish finder.

fish-scrap = fish remains after oil has been extracted; often used as fertiliser. Also called fish pomace, fish waste.

fish-screen = 1) a screen across a body of water or structure, e.g. the turbine intake of a dam, designed to divert the fish into a bypass system.

fish-screen = 2) a grating or mesh positioned in a river to strain fish from the water. Fences or netting direct fish onto the screen where they run aground while the water drains through the mesh.

fish-screw = a device for pressing dried cod into a cask or barrel.

fish-seed = 1) fertilised eggs, fry or fingerlings used for growing in aquaculture facility or for stocking grow-out areas.

fish-seed = 2) kokkel-seed or lice-seed, the fruit of *Anamirta cocculus* a creeping shrub of Asia. Contains pikrotoxin used in small pellets of dough thrown in the water to stupefy fish eating them.

fish-service = a china service for fish with a platter, sauce boat and plates.

fish-shed = fish house (Maritime Canada).

fish-shelter = an artificial structure made from twigs, brush, branches, concrete blocks, etc. as a refuge or hiding place for fish at which they are also easily caught.

fish-side = the flesh side of a split fish as opposed to the skin side (Scottish dialect).

fish-silage = liquefied fish waste produced by self-digestion, with the addition of acid to prevent decay, or fermentation and used for animal feed. Also called liquid fish.

fish-skin = 1) the skin of a fish.

fish-skin = 2) a condom.

fish-skin = 3) a dollar bill.

fish-skin disease = ichthyosis (a congenital skin disease in humans where the epidermis becomes hard, rough and scaly. Also called fish-scale disease).

fish-skin grain = a grain in leather resembling fish skin.

fish-skinner = a ridged roller to remove fish skin and scales. There are small hand-operated models for sport fishermen and hand-operated or powered models for skinning fish on a commercial scale (no pun intended).

fish-slice = 1) a broad knife for lifting and dividing or carving fish at a table.

fish-slice = 2) an implement used by cooks for turning fish in a pan.

fish-slide = an inclined structure of box-like shape set in a stream at a ripple or small waterfall to catch descending fish.

fish-slime disease = a condition in humans where septicaemia follows a puncture wound made by the spine of a fish.

fish-soluble = a water-soluble protein byproduct of fish meal production, usually condensed to 50% solids and sold as condensed fish solids. A concentrated form of stick water.

fish-sound = gas bladder (a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, sound receptor, respiratory organ. Often lacking in bottom fishes. Sometimes called air bladder, a less appropriate term).

fish-soup = any soup made from fish with seasonings and vegetables.

fish-spear = 1) a spear with 3-5 prongs on the end in various arrangements used to capture fish.

fish-spear = 2) a trident with barbs or flukes is the symbol for the staff of Greek Poseidon or Roman Neptune, gods of the sea.

fish-spinner = a hurricane, cyclone or typhoon.

fish-staff = a gaff or fish hook.

fish-stake = one of a series of poles or stakes placed in shallow water to outline fishing areas.

fish-steak = a cross-section slice of a large, dressed fish.

fish-stearin = a solid formed from fish oils and used in lubricants and coarse soaps.

fish-stew = a small pond where fish are kept for eating, now obsolete. Also called vivarium.

fish-stick = 1) fish marketed in the form of rectangular sticks cut from a block of frozen fish fillets, breaded, fried in fat, or sold frozen for cooking. See also goujonettes de sole and fish finger.

fish-stick = 2) a fish spear with a single point.

fish-stock = 1) a distinct genetic population, a population defined by movement pattern, part of a population potentially harvestable, or a quantity of fish from a given area; usually isolated from other stocks of the same species and so self-sustaining. May be a total or a spawning stock.

fish-stock = 2) used for steaming fish; made of lightly salted cold water, bones and trimmings of fish, seasonings, simmered for half an hour, strained when almost cold and a little white wine or vinegar added.

fish-stone = a stone table used for the sale of fish, presumably because it is easily washed and cleaned.

fish-store = 1) a store selling fish.

fish-store = 2) a building where dried cod from the offshore fishery is stored for collection or export (eastern Canada). Also used to store gear in winter and spring and as a place to mend nets.

fish-story = a tall tale, an unlikely story, an exaggerated narrative, a yarn.

fish-stove = fish stew.

fish-strainer = 1) a metal colander for taking fish from a boiler.

fish-strainer = 2) a perforated earthenware slab at the bottom of a dish allowing liquid to drain from a boiled fish.

fish-supper = 1) an evening meal where fish is the main item.

fish-supper = 2) fish and chips, q.v.

fish-symbol = ichthus (a representation of a fish; an amulet or talisman shaped like a fish; an iconographic symbol for Christ from the initials in the Greek phrase Iesous Christos Theou Huios Soter (Jesus Christ Son of God Saviour). Also spelt ichthys).

fish-tackle = 1) wire tackle for emptying the cod end of a trawl, stronger than gilson tackle.

fish-tackle = 2) equipment to raise the flukes of an anchor to the gunwale. Also called fish block.

fish-tail = 1) the tail or caudal fin of a fish.

fish-tail = 2) any device shaped like a fish tail.

fish-tail = 3) the uncontrolled movement of the rear end of a vehicle, e.g. on snow or ice.

fish-tail = 4) to swing the tail of an aeroplane from side to side in order to reduce speed.

fish-tail = 5) an arrow wobbling in flight.

fish-tail = 6) a turning ballroom step.

fish-tail bit = a drilling bit shaped like a fish's tail.

fish-tail burner = a type of gas burner, having two openings in the top, from which the jets of gas issue and form a flat flame, the plane of which is at right angles to that of the openings.

fish-tail cutter = a cutter for milling slots and keyways.

fish-tail lawyer cane = a palm of the Arecaceae family, *Calamus caryotoides* from northern Queensland.

fish-tail palm = a palm of the Arecaceae family in the genus *Caryota* from tropical Asia.

fish-tail point = a fluted and stemmed, fishlike stone tool from South America dating to 11,000-8000 B.C.

fish-tail propeller = a propeller with a single blade that oscillates like the tail off fish when swimming.

fish-tail wind = a variable wind that blows across shooting ranges.

fish-tank = 1) a fish or water holding structure of varying size and construction material, from an aquarium to a large outdoor pond.

fish-tank = 2) in a museum, a large, often rectangular container for storing fluid-preserved specimens. Usually of stainless steel as wood and plastic containers eventually deteriorate.

fish-tank = 3) a cabinet of microfiches.

fish-tank granuloma = fishkeeper's granuloma.

fish-tape = flexible, flat metal wire used to pull other wires through conduits or wall spaces.

fish-tapeworm anaemia = a medical condition of humans, a rare form of macrocytic anaemia caused by infestation with the tapeworm *Diphyllobothrium latum*.

fish-tapeworm infection = ingesting the larvae of the tapeworm *Diphyllobothrium latum* through eating undercooked fish. More common in cold, fresh lakes such as the Great Lakes. The adult worm can reach 30 feet in length in the human intestine, causing blood in the faeces (and worm segments may be visible) and vitamin B12 deficiency.

fish-tester = an electronic device with electrodes which are applied to the fish just behind the head. The current properties measure freshness.

fish-thistle = a Syrian thistle plant, *Chamaepeuce diacantha*.

fish-tiger = a bird that preys on fish.

fish-tongue = 1) long-handled tongues used for catching fish or for holding slippery or dangerous fish such as moray eels.

fish-tongue = 2) a device for removing wisdom teeth, named for its shape.

fish-tongue = 3) a commercial product, often marketed with fish cheeks, fresh, frozen or cured.

fish-top = a movable box-like structure to cover piled cod-fish. Also called fish house and fish room.

fish-torpedo = a torpedo resembling a fish in shape.

fish-toun = a fishing village (Scottish dialect).

fish-track = fossilised remnants of fish moving over the bottom; traces of pectoral and other fins. Also called ichthyopatolites.

fish-trap = a spring-loaded trap made of netting on a frame that closes over a fish. The two rectangular halves of the trap are spread apart from the central spring mechanism. The fish is attracted by bait or a dummy fish that the fish sought tries to fight, e.g. a wooden male salmon painted in spawning colours. See also shutter trap.

fish-trap boat = herring weir seine boat (an open boat about 28 feet long with an inboard motor. Has three man crew and is used to tend herring seines, traps and weirs).

fish-trowel = 1) a fish slice or fish carver having a trowel shape.

fish-trowel = 2) a gardener's tool shaped like a scoop.

fish-trowel = 3) a tool used for smoothing a mold.

fish-van = 1) a light spring-cart for carrying fish.

fish-van = 2) a railway truck dedicated to fish transport.

fish-warden = an official who enforces game laws relating to fish.

fish waste = 1) fish that are caught but do not have market value as food, fish parts as a by-product of the production process. May be used for fish meal, fish oil, pet food, hatchery food, animal food, and other byproducts.

fish waste = 2) fish remains after oil has been extracted; often used as fertiliser. Also called fish pomace, fish scrap.

fish-water = 1) a fixed volume of water in which a fish has been kept for a certain period. This water contains external metabolites and can be used in various experimental procedures, e.g. predator/prey interactions without the predator present (metabolite production by the predator may be suppressed when prey is present).

fish-water = 2) a water body in which fish can, or do, live.

fish-way = fish ladder.

fish-wear = fish weir.

fish-weed = pondweed (*Potamogeton*).

fish-weiner = a smoked fish sausage.

fish-weir = 1) a dam in a river to back up water to form a fish pond; a fish garth.

fish-weir = 2) a fence of stakes, brushwood, etc. for catching fish.

fish-weir = 3) a draught or catch of fishes.

fish-well = a storage compartment in a fishing vessel for live fish, usually in a sport fishing boat.

fish-wheel = a series of lift nets on a wheel frame that is rotated by the river current, catching migrating fish and dumping them through a chute into a basket.

fish-whole = as sound as a fish, healthy.

fish-wife = 1) a woman who sells fish.

fish-wife = 2) a foul-mouthed coarse, abusive woman.

fish-wife = 3) the female wife or consort of a homosexual male (U.S. slang, mid-1900s onward).

fish-woman = a woman who retails fish. Also a fish-wife.

fish-wire = fish tape.

fish-wood = 1) Jamaican dogwood or Florida fish-poison tree (*Piscidia piscipula* (Fabaceae, pea family), also called fishfuddle tree. Not a member of the dogwood family. Seminoles in Florida used a powder made from its roots, bark, and leaves to stun fish. See also fish poison tree.

fish-wood = 2) *Euonymus americana* (Celastraceae) or strawberry bush of eastern North America.

fish-worker = an aquaculturist.

fish-working = fish culture.

fish-works = 1) the equipment used in aquaculture.

fish-works = 2) a fish factory where the products of a fishery are used.

fish-worm = 1) a parasitic worm of fishes.

fish-worm = 2) an earthworm used as bait in angling. Also called fishing worm.

fish-worship = ichthyolatry, the worship of fishes or fish-shaped idols.

fish-wrapper = a journal, newspaper or chronicle.

fish-yard = fish garth.

fishability = the quality or state of being fishable.

fishable = 1) legally open for fishing.

fishable = 2) may be or admits of being, fished in.

fishable = 3) suitable, promising, e.g. of the weather.

fishable stock = the part of a stock that is available to be fished, i.e. large enough to be caught and living in places accessible to fishing gear.

fishapod = nickname for the late Devonian fossil *Tiktaalik roseae*, a sarcopterygian from Ellesmere Island, Canada, an ancient fish with a mobile neck, limb development, lungs and ribs like tetrapods. As an intermediate form between fish and tetrapods, it is important in arguments for evolution over intelligent design.

fishback = a marked deck of cards in gambling.

fishball = fish don't have balls but are sometimes made into them. A ball of shredded white fish or cod and mashed potatoes, flour or other binding material, usually fried. Also called fish dumpling. See also canned fish ball, catfish ball and ball.

fishbar = 1) fish plate (1).

fishbar = 2) a restaurant serving fish, often sushi, with seats at a bar.

FishBase = a comprehensive on-line database about fish at [www.fishbase.org/home.htm](http://www.fishbase.org/home.htm).

fishbed = 1) a stratum rich in fish fossils.

fishbed = 2) code name for a Soviet delta-wing supersonic fighter, 1956.

fishbelly = anything white like a fish belly including certain plants where leaves are white on the underside and turned up in the wind.

fishbelly sill = a side or central sill used in railroad car construction; named for its fish shape.

fishberry = a plant used to kill or stupefy fish when placed in water as an extract, e.g. Levant berry (*Cocculus indicus* (an older name) or *Anamirta paniculata*) crushed and scattered on the water surface by Indian fisherman.

fishbladder = 1) the storage sac for urine.

fishbladder = 2) a figure composed of two equal and symmetrically placed circular arcs. See also vesica piscis.

fishbladder = 3) gas bladder (a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, sound receptor, respiratory organ. Found in Actinopterygii. Often lacking in bottom fishes. Sometimes called swim bladder or air bladder, less appropriate terms).

fishboiler = 1) a fish kettle.

fishboiler = 2) a Norwegian (slang).

fishbolt = a bolt for securing a fish plate.

fishbone diagram = a graph used in quality control to identify possible problem causes.

fishbone beard lichen = a lichen, *Usnea fillipendula*, with antibiotic properties, widely used since ancient times. Its fibrils have been likened to a fish-bone appearance.

fishbone stitch = a series of diagonal, single-purl stitches zig-zagged across an unmarked line.

fishbone tabby = mackerel tabby cat (a cat with characteristic, gently wavy bars on the flank, reminiscent of the fish pattern. The most common tabby pattern).

fishbone thistle = fish thistle.

fishbone tree = *Panax crassifolium*, a small tree from New Zealand.

fishbones = oscillations in soft x-ray emissions which have the appearance of fish bones.

fishbowl = 1) a round glass bowl used for keeping ornamental or pet fish.

fishbowl = 2) a situation where one's activities are constantly observed, scrutinised, commented on, etc.

fishbowl = 3) jail.

fishbrain = in inline skating a slide where the skater grabs one skate with the hand closest to it.

fishburger = a hamburger with the patty made from fish.

fishcar = a railroad car with water tanks for transportation of live fish.

fishcarle = a fisherman.

fishcarrier = 1) a boat used to transport a catch of fishes from a vessel to the shore.

fishcarrier = 2) a container used to keep fish alive during transportation.

fishcarver = a carving knife used for fish. May be paired with a fork.

fishcatching box = a fry trap placed behind the monk, *q.v.*, to catch fish when a pond is drained.

fishchip = a delicatessen potato chip-like product made of equal parts of fish and potato.

fishchowder = a thick soup mix of cooked fish and/or shellfish and potatoes in a broth made from pork, flour, seasonings and fish stock.

fishcicle = a block of ice with fish frozen in it, a treat for zoo penguins.

fishclamp = a type of fish spear with several prongs that hold a fish without excessive injury. The prongs may be pointed and barbed too but the purpose of the clamp is to secure the fish with little damage.

fishclimer = a plant (?) whose red and black-kernelled beans when bruised and thrown into water will stupefy fish.

fishclip = fish clamp.

fishcocktail = ceviche (raw white fish marinated in lemon or lime juice and served with sweet limes, avocados, onion rings, garlic, cilantro, chilies, boiled corn and tomatoes. Originally from Peru, variously modified).

fisgig = a harpoon for catching fishes (archaic).

FISHDO = forget it, stuff happens, drive on.

fished = 1) supplied with fish.

fished = 2) a means of installing electrical wiring by using elongate wire hooks to fish the wires through hollow spaces in walls.

fished = 3) strengthened or fastened together.

fished beam = a beam with a belly on the underside.

fished joint = an end butt splice strengthened by pieces nailed to the sides.

fished up = brought up.

fisher = 1) a person participating in a fishery (gender neutral, in preference to the previously used term "fisherman"). Once archaic and now resurrected. See also angler.

fisher = 2) disciples in the Christian Bible.

fisher = 3) victualler.

fisher = 4) a large arboreal mammal (*Martes pennanti*) from North America. It is not a major consumer of fish, except as carrion, and the name may come from the French "fichet", the name for a pelt of the European polecat.

fisher = 5) any animal that catches fish as food.

fisher = 6) an implement used by tanners.

fisher = 7) a boat used in fishing.

fisher = 8) a fishmonger.

Fisher = 9) a common surname in English with various terms named for the person and having nothing to do with fish, e.g. Fisher equation, Fisher index are given below as two examples from economics; there are various others from various disciplines.

fisher = 10) a currency note, £1.00.

fisher- = 11) used in combination with various words, not all listed here, either hyphenated or as one word, e.g. fisherfolk, fisher-boat, usually with an obvious meaning.

fisher = 12) apples baked in batter (Devon, England)(archaic).

fisher = 13) a toady or lickspittle.

fisher boat = a boat used in catching fish.

fisher body = fisher (1).

fisher cat = fisher (4).

fisher doddie = fisherman (Scottish dialect).

fisher dozen = 13 or more, depending on the generosity of the fisher selling fish.

Fisher equation = in economics, estimates the relationship between nominal and real interest rates under inflation.

fisher folk = fisher (1).

Fisher index = in economics, a form of price index.

Fisher King = the custodian of the Grail in the Arthurian Romance. The apostles were fishermen.

fisher land = land on the shore used by fishermen to dry their nets (Scottish dialect).

fisher nannie = fisher woman.

fisher of souls = the devil.

fisher person = fisher; an unnecessary expansion of the politically correct word for someone who catches fish, occasionally seen in newspapers.

fisher woman = a woman who fishes commercially or for pleasure.

fisher's berry = fish berry.

fisher's folly = an angler's house in the country.

fisher's knot = a slip knot.

fisher-boat = a boat used in catching fish.

fisher-land = land on the shore used by fishermen to dry their nets (Scottish dialect).

fisher-nannie = fisherwoman (Scottish dialect).

fisher-packer = in Canada, a fisher licensed to both catch and process fish without assistance from anyone not involved in catching the fish.

fisher-person = fisher; an unnecessary expansion of the politically correct word for someone who catches fish, occasionally seen in newspapers.

fisher-woman = a woman who fishes commercially or for pleasure.

fisher's dozen = thirteen.

fisherate = to provide for.

fisherboat = a boat used in catching fish.

fisheress = a female fisher (rarely used).

fisherfolk = people who make their living by fishing.

fisherian evolution = holds that phenotypic differentiation derives from positive natural selection primarily; random drift in small populations is less important. Named for R. A. Fisher, not fish.

fisheries = plural of fishery, at least in some of its definitions.

fisheries extension = work with a community on fisheries and related areas like conservation.

fisheries management arrangement = fisheries management organisation.

fisheries management authority = an official body making decisions on how a fishery is managed. It collects and studies statistics on catches, makes assessments, monitoring, control, surveillance, consults with fishers, allocates resources, and defines access to the fishery.

fisheries management organisation = an institution responsible for fisheries management, including the formulation of the rules that govern fishing activities. Also called fisheries management arrangement.

fisheries management plan = a contract between interested parties and the fisheries management authority as to how a fishery should be managed.

fisheries regulations = controls to restrict effort in fishing (input controls) or the total catch (output controls) in a fishery.

fisheries structure = all those items used in the fishing industry such as nets and vessels.

fisheries-sensitive zones = areas of water bodies that are seasonally occupied by over-wintering anadromous fish. Includes channels, swamps, seasonally flooded depressions, lake littoral zones and estuaries

fisherman = 1) a male engaging in fishing for sport or commercially. Fisher is the gender-free term although the archaic fisheress could be used for female fishers.

fisherman = 2) a ship used for commercial fishing.

fisherman = 3) an animal that catches fish.

fisherman follows the fish = the concept indicating that the fisherman's right to receive payment or credit for a catch before other disbursement of monies by a merchant (Newfoundland).

fisherman knit = a sweater with thick, ribbed knitting of heavy yarn in cable stitches, presumably favoured by fishermen in colder climes.

fisherman's = fisherman's daughter.

fisherman's basket = a pitcher plant (*Sarracenia purpurea*) or slipperwort (*Calceolaria* sp.). Also called fisherman's trawl.

fisherman's bend = a knot for tying a line to a ring or spar, e.g. when mooring a boat; the end is passed twice through the ring or around the spar and then back under both turns.

fisherman's brewis = cod cooked with hard tack or sea biscuit and pork fat (Newfoundland).

fisherman's daughter = rhyming slang for water.

fisherman's friend = a range of lozenges developed in Fleetwood, Lancashire in 1865 to relieve various respiratory problems suffered by fishermen who sailed from this fishing town.

fisherman's holiday = 1) a holiday to mark the end of the fishing season in the autumn and the return of the migratory vessels to England from Newfoundland.

fisherman's holiday = 2) enforced cessation from fishing because of bad weather.

fisherman's joke = a fried Italian dish of small squid (calamari) eaten by popping them directly in the mouth. Unbeknownst to the eater, one of these small squid is filled with hot red pepper.

fisherman's knot = a knot for tying the ends of two lines together. Various websites have animated steps showing how to tie this knot.

fisherman's lure = any bright artificial bait consisting of plastic or metal mounted with hooks and trimmed with feathers.

fisherman's nightingale = a name for the sedge-warbler.

fisherman's ring = a gold papal seal used on documents and placed on the new pope's finger by the cardinal camerlengo. It has a representation of St. Peter fishing in a boat with the new pope's name around it.

fisherman's soup = 1) any soup prepared by a fisherman from his catch by the water.

fisherman's soup = 2) a soup prepared in Hungary (and neighbouring countries) made with hot paprika, carp (or other river fishes such as catfish, perch and pike), starting with a court bouillon made from carp heads, bones, skin and fins. These are boiled with water, salt, black pepper and such vegetables as green and red peppers, onions and tomatoes for two hours. The court bouillon is strained and the ground paprika, carp fillets and roe are added, ten minutes before serving, to the boiling soup.

fisherman's staysail = a triangular or squarish sail between the foremast and the mainmast of a fishing schooner.

fisherman's trawl = fisherman's basket.

fisherman's walk = falling overboard; in full, a fisherman's walk, three steps and overboard.

fisherman-diver = the aquatic bird, merganser.

fisherman-planter = a fisherman who is also the owner of a fishing premises, a boat or a small vessel and who, supplied by a merchant, engages a crew to work on the share system (Newfoundland).

Fishermen = Grimsby Football Club.

fisherperson = fisher; an unnecessary expansion of the politically correct word for someone who catches fish, occasionally seen in newspapers.

fishers of men = "Follow me, and I will make you fishers of men" (Matthew, 4, 19).

fisherwoman = a woman who fishes commercially or for pleasure.

fishery (plural fisheries) = 1) the catching of fish or of a particular kind of fish for commerce or sport. The total world commercial catch in 2000 was 86 million tons (presumably metric tonnes).

fishery (plural fisheries)= 2) a place for catching fish.

fishery (plural fisheries) = 3) a place where fish breed.

fishery = 4) the legal right to fish in a specific stretch of water.

fishery (plural fisheries) = 5) the capture of organisms other than fishes for commerce, e.g. whales, various invertebrates.

fishery (plural fisheries) = 6) a fishing establishment.

fishery = 7) fishes of different kinds.

fishery biological interactions = usually fishing activity influencing interactions between two or more populations or species, e.g. between predator and prey, when the former is caught by fishing, stocks of the latter will increase.

fishery biologist = a student of the applied science concerning the obtaining of the best yields in commercial and sports fisheries

fishery biology = the applied science concerning the obtaining of the best yields in commercial and sports fisheries.

fishery commission = an international body that sets management measures for the conservation of internationally exploited fish stocks (those outside territorial waters).

**Fishery Conservation Zone** = the area from the seaward limit of state waters out to 200 nautical miles. The term is used less often than the current term, Exclusive Economic Zone. Abbreviated as FCZ.

**fishery dependent data** = data collected on a fish or fishery from sport fishermen, commercial fishermen, and seafood dealers.

**fishery development** = improving the fishery, fishery communities, fish workers and society in general. This may be in the technology of fishing, in management, in education, health, social services, insurance, etc.

**fishery economics** = the production, distribution and consumption of fish and the associated financial aspects.

**fishery ecosystem plan** = in contrast to plans dealing with exploited fisheries, this plan deals with fisheries at the ecosystem level.

**fishery exclusion zone** = an area closed to fishing, hopefully resulting in increased biomass, greater average size of spawners and stock enhancement in neighbouring fished areas. Abbreviated as FEZ.

**fishery independent** = characteristic of information, e.g. stock abundance index, or an activity, e.g. research vessels survey, obtained or undertaken independently of the activity of the fishing sector and so intended to avoid the biases inherent to fishery-related data.

**fishery independent data** = data collected on a fish by scientists who catch the fish themselves, rather than depending on fishermen and seafood dealers.

**Fishery Management Plan** = a plan to achieve specified management goals for a fishery. It includes data, analyses, and management measures for a fishery. Abbreviated as FMP.

**fishery model** = a representation of a fishery, usually simplified and may be mathematical.

**fishery mortality rate** = a measure of how quickly fish are removed from a population. Fishing mortality rates greater than 1.0 are considered very high.

**fishery mound** = a mound used to raise buildings associated with a fishery, such as a smoke house, above the flood plain.

**fishery policy** = measures to control a fishery by the regulatory agency. May be fiscal, trade, social, scientific, etc.

**fishery potential** = quantity of fish that can be caught without exhausting the resource.

**fishery product** = any item that is derived from fish; and in a general sense any aquatic product excluding mammals and frogs.

**fishery protection** = regulations promulgated by a government to protect, encourage and maintain the fishery.

fishery protection vessel = a patrol boat that inspects fishing vessels, their gear and catch, and enforces national regulations.

fishery reserve = a zone that precludes fishing activity on some or all the species. The zone aims to protect and rebuild stocks, protect habitat, provide insurance against overfishing or enhance yields.

fishery resource = strains, species, populations, stocks, or assemblages which can be legally caught by fishing. May sometimes be taken as including also the habitat of such resources.

fishery salt = a coarse salt (sodium chloride) used in curing fish. Also called fishing salt.

fishery servant = a person indentured or engaged on shares or wages for a defined period in the Newfoundland fishery of the nineteenth century.

fishery stock = commercial stock (that part of a commercial fish stock which could potentially be used by the fishery).

fishery technology = the equipment and its use for locating, catching, processing and marketing fish.

fishery vessel = any boat, ship, or other craft used to catch fishes, or in support of a fishery such as fueling, refrigeration, supply, processing, mother ship.

fishery-independent = characteristic of information, e.g. stock abundance index, or an activity, e.g. research vessels survey, obtained or undertaken independently of the activity of the fishing sector and so intended to avoid the biases inherent to fishery-related data.

fishery-independent data = data collected on a fish by scientists who catch the fish themselves, rather than depending on fishermen and seafood dealers.

fishes = plural of fish; can be used to indicate many species of fish as opposed to fish which is an individual or many individuals of the same species. The general term for five living Classes and several extinct Classes of vertebrate animals showing great diversity in form. Includes the living Myxini (hagfishes), Petromyzontida (lampreys), Chondrichthyes (sharks, skates, rays and chimaeras), Actinopterygii (ray-finned fishes) and Sarcopterygii (lobe-finned fishes). Strictly, the Sarcopterygii includes Tetrapoda (amphibians, reptiles, birds and mammals).

fishes' eyes = slang for tapioca pudding.

Fishes of Ea = the "second Adar" added during leap years; the twelfth Assyrian month, Adar, belonged to the "Star of the Fish of Ea" (Ea being a fish god).

fishes royal = dolphins, whales and sturgeons belonging to the reigning British monarch in waters around the British Isles following a 1324 statute.

fishes' wazz = pretentious (British slang). From the French, vichyssoise.

fishet = a little fish (a nonce word).

fishey = 1) variant spelling of fishy.

fishey = 2) particularly intoxicated with alcohol.

fisheye = 1) an eye like that of a fish.

fisheye = 2) a wide-angle lens on a camera covering about 180°.

fisheye = 3) a weld defect having a hole or piece of matter surrounded by a circular area of brightness.

fisheye = 4) a diamond or other gem cut too thin for proper brilliance.

fisheye = 5) a variety of moonstone.

fisheye = 6) an imitation diamond.

fisheye = 7) a small blemish in finished paper caused by a crushed and glazed particle.

fisheye = 8) a cold or suspicious stare.

fisheye = 9) blank, expressionless.

fisheye = 10) ocular lymphomatosis in fowl.

fisheye = 11) in oil drilling fluids, slang for a globule of partly hydrated polymer formed by poor dispersion during mixing. About 0.2-0.5 inches in size, they consist of a granule of unhydrated polymer covered by hydrated polymer and so are impervious to water and do not disperse.

fisheye disease = an inherited disorder in humans resulting in low HDL cholesterol and corneal opacity.

fisheye stone = apophyllite, a general term encompassing three minerals.

fisheyes = slang for tapioca pudding.

fishfall = 1) the tackle depending from a fish davit used in hauling up the anchor to the gunwale.

fishfall = 2) rains of fishes (fishes falling from the sky like rain or in rain, the result of waterspouts and whirlwinds (see account by Gudger (1921))).

fishface = 1) someone having a face reminiscent of a fish, although not necessarily having any features particularly fish-like.

fishface = 2) a term of abuse, sometimes used affectionately. Refers to an open mouth like a gaping fish and a blank expression, indicative of lack of brain function.

fishfag = female fish monger.

fishfarm = an aquaculture facility.

fishfast = the observance of a fish day.

fishfeed = commercial fish food, often in pellet form and based on fish oil and fishmeal.

fishfence = any structure made of wood, brushwood, mats, etc. used to catch or direct fish into traps. These may be in the form of a net narrowed inward to prevent fish finding the entrance again, to elaborate labyrinths. The general base form is triangular or heart-shaped, with complex fencing and multiple base forms in a labyrinth.

fishfinder = 1) a sonar device or echo sounder used to locate fishes and determine water depth.

fishfinder = 2) a surf-fishing rig comprising a pyramid-shaped sinker running freely along the line; this allows the bait to be carried by the tide or run by a fish.

fishfinger = fish stick.

fishflake = a rack on which fish are dried, often of spruce boughs on a framework of poles in North America.

fishflakes = cooked haddock or cod flesh broken up into flakes and then canned.

fishflop = a somersault involving flipping feet in the air.

fishflour = a flour made of pulverised, dried fish parts.

fishfly = a large, soft-bodied insect found near streams with aquatic larvae called hellgramites used as fish bait (Corydalidae, Megaloptera).

fishfood = the food eaten by fishes, *cf.* fish-feed.

fishfork = 1) a large, short-handled fork used in unloading fish.

fishfork = 2) a 4-tined fork used in eating fish, larger than a salad fork.

fishfront = fish (9) a piece of timber used to strengthen a mast or spar when sprung, often somewhat fish-shaped).

fishfry = 1) an indoor or outdoor party where fish and seafoods are cooked and eaten.

fishfry = 2) fried fish.

fishfry = 3) fry or young fish.

fishfuddle tree = Florida fish-poison tree.

fishful = abounding with fish.

fishgaff = a long pole with a metal hook on the end, used to secure large fish caught on hook-and-line and haul them on board a vessel.

fishgarth = a dam or weir in a river for keeping or catching fish.

fishgate = a gate in the walls of ancient Jerusalem where the fisherman of Galilee would bring in their catch.

fishgig = 1) a pole with barbed prongs for striking fish. Loaded at the end with lead.

fishgig = 2) an arrangement of hooks dragged through the water to foul-hook fish.

fishglobe = a spherical glass container for keeping pet fish.

fishgorge = an old piece of fishing gear comprising a short piece of wood, bone, horn, flint or metal, variously shaped, but having sharp ends, usually a central attachment for the line, and embedded in bait. When the fish swims away, having swallowed the baited gorge, it lodges crosswise in the throat. Variants have line attached at one end and the other end pointed, a cross-shape that spreads open when the line is pulled, and the spring-gorge or spring-angle, q.v.

fishgrained split = a book binding of a sheepskin split, dyed and embossed with a gunpowder grain.

fishgrass = water shield or fanwort (*Cabomba caroliniana*), an aquatic plant of North America.

fishgravy = fish sauce, e.g. Thai fish sauce.

fishgription = the ability to hold a slippery fish long enough to take a photograph (slang).

Fishguard = a town in Wales named from the old Norse fiskigarðr meaning a fish catching enclosure.

Fishguard herrings = sardines which were, for a short period, abundant in the Irish Sea. The shoals came to an abrupt end in 1790, devastating the economy of Fishguard. The people of Fishguard call themselves "Fishguard herrings".

fishguide = 1) any device used to direct fish to a certain place for capture or avoidance of danger, e.g. lights, bubbles, sound, electricity.

fishguide = 2) a professional fishing guide who directs the angler to spots where trophy fish can be found and advises on tackle to catch them. See also ghillie.

fishhawk = osprey (*Pandion haliaetus*).

fishhead = an apparatus for withdrawing the clacks of pumps through the column.

fishhold = an enclosed space on a vessel for storing fish; may be insulated and/or refrigerated.

fishhook card = the seven in the layout of the card game faro.

fishhood = the state or condition of fish (rarely used).

fishhook = 1) a bent piece of wire with its tip sharpened and often a barb below the tip used to catch fish. Available in many sizes and styles. May be single, double or treble but all these are counted as one hook in angling regulations. Hooks separated by stretches of line are counted as multiple hooks. See hook.

fishhook = 2) a large hook with a pendant to which the fish tackle is hooked in fishing an anchor.

fishhook = 3) a sharp broken strand in a wire.

fishhook cactus = cholla cactus (*Opuntia* spp.) or barrel cactus (*Ferocactus wislezenii*) of the American southwest with hooked spines.

fishhook displacement = a medical condition in humans where the stomach is displaced. The orifice of the pylorus faces directly upward and the duodenum runs upward and to the right to join the pylorus at an angle, producing a constricting hook. Asymptomatic.

fishhook flea = a crustacean (*Cercopagis pengoi*, Cladocera) from the Black and Caspian seas now introduced to North American lakes. Their tails are long, spiny and shaped like a fish hook and they hook themselves together, clogging fish nets and lines.

fishhook money = Persian larin money, scimitar-shaped.

fishhook wire = a wire of twisted strands with a piece of wire resembling a fish hook inserted at intervals.

fishhooked wire = fish-hook wire.

fishhooks = fingers (slang).

fishhooks in one's pocket = to be very cheap. From Samuel Mulford who sewed fish hooks in his pockets on a visit to London in the eighteenth century to avoid pickpockets.

fishhouse = 1) a building where fish are stored or processed.

fishhouse = 2) a restaurant serving or specialising in fish and seafood.

fishhouse = 3) a building from which fish are sold. Also called fishroom.

fishhouse = 4) fish top (a movable box-like structure to cover piled cod-fish. Also called fish room).

fishhouse punch = a punch made of rum and brandy and water or tea sweetened with sugar syrup. Developed at the Fish House Club, formed in 1732 by a group of anglers who fished for perch on the Schuylkill River.

fishibian = a non-scientific term for the sequence of fossils which elucidate the transition from fish to amphibian, e.g. the fishapod.

fishie = slang for a little fish.

fishies = fragments of food left in your drink by the person you shared it with (courtesy of Sylvie Coad).

fishier = comparative of fishy.

fishiest = superlative of fishy.

fishify = to change to fish (as with flesh).

fishily = in a fishy manner

fishiness = the state or quality of being fishy or fishlike.

fishing = 1) capturing of fish (and other aquatic animals) by any and all means for any and all purposes.

fishing = 2) the act of one who fishes.

fishing = 3) a place for catching fish.

fishing = 4) the right of taking fish.

fishing = 5) in rodeo, roping in such a way as to convert a near miss into a fair catch.

fishing = 6) to seek for an obliging or mercenary woman, as in go fishing.

fishing = 7) an heroic treatment tried by some laymen to avoid falling asleep in church on Sunday.

fishing access site = an area adjacent to a water body acquired to allow anglers access to the water.

fishing admiral = before Newfoundland was permanently settled, there was no resident governor. The first ship to enter harbour each spring had first choice of onshore facilities (fishing rooms) and its master became the "Admiral" for the rest of the season (the master of the second ship became Vice-Admiral, of the third Rear-Admiral). The fishing admirals maintained law and order and regulations in respect of the fishery. The system died out after the appointment of a governor in 1729.

[fishing apparatus](#) = a mechanism for attracting prey close to the mouth in members of the Lophiiformes formed from dorsal fin spines modified into a fishing rod (illicium) with a lure (esca) at the tip.

fishing area = a water body, part of a water body or a group of water bodies within a fishing region.

fishing bank = an area where the depth of water is relatively shallow and excellent for fishing, e.g. the Grand Banks off Newfoundland.

fishing bat = about 6 species of bats are known to catch fish such as the Mexican fishing bat (*Myotis vivesi*), the bulldog or greater fishing bat (*Noctilio leporinus*), and a flying fox (*Pteropus*) reputed to catch fish in the sea. They trail their enlarged feet through the surface water, hooking fish detected by echolocation of ripples with their sharp claws.

fishing bear = a bear of northeastern Eurasia that live mostly on fish (*Ursus arctos beringianus*).

fishing bed = a commercial fishing area on the sea floor.

fishing berth = a particular station on the Newfoundland fishing grounds assigned to or claimed by a vessel, a boat, a crew, or a family.

fishing boat = a vessel designed for fishing, often with a well to keep the fish alive.

fishing by foot = 1) fishing without gear; collecting fish by hand, e.g. stranded fish in tidepools. Practised even on a commercial level in France in the past.

fishing by foot = 2) using the feet to detect fish in sand, mud, spawning cavities and cocoons, to be grasped by hand or simple tools. Flatfishes are caught this way in East Friesia, tilapia from spawning holes in Egypt, and on dry land the cocoons of lungfish can be located by stamping - the fish grunts and can be found and dug out.

fishing capital = the capital used for harvesting fish, e.g. fishing vessels.

fishing capacity = 1) the quantity of fish that can be taken over a period of time (year, season) by a fishing unit, e.g. an individual, community, vessel or fleet, assuming that there is no limitation on the yield from the stock usually expressed as gross tonnage, hold capacity, or horsepower. Reflects potential rather than nominal fishing effort. It may be the maximum amount of fish that can be produced by a fishing fleet if fully utilized, given the biomass and age structure of the fish stock and the present state of the technology.

fishing capacity = 2) capital producing effort or catch.

fishing capacity = 3) the size and characteristics of individual fishing vessels.

fishing cat = a spotted wildcat living in swamps of southeast Asia (*Felis viverrina*) that feeds mostly on fish.

fishing chair = fighting chair.

fishing charity = fishing matches or excursions organised to aid charitable works. Some organisations are based solely on fishing for charity and incorporate these words in their name, e.g. The Masonic Trout and Salmon Fishing Charity.

fishing circle = the circumference of a trawl.

fishing club = fish club (2).

fishing community = a community heavily dependent on catching and/or processing fish.

fishing depth = the depth at which fish are caught.

fishing derby = a fishing competition with money and prizes for the best catches in North America.

fishing down = removal of older fish from a stock that has not been heavily fished. Catches are high initially but this cannot be sustained.

fishing down the food web = the shift in fishes sought commercially from long-lived, high trophic level, piscivorous bottom fish toward short-lived, low trophic level invertebrates and planktivorous pelagic fish. At first catches increase, but then become stagnating or declining. The removal of fish and invertebrates from lower trophic levels removes the food higher trophic level fishes need to reproduce and maintain their populations.

fishing duck = merganser (*Mergus merganser*).

fishing coefficient = rate of exploitation (the fraction, by number, of the fish in a population at a given time, which is caught and killed by man during the year immediately following (= FA/Z when fishing and mortality are concurrent). The term may also be applied to separate parts of the stock distinguished by size, sex, etc. Abbreviated as u or  $u$  (Ricker, 1975)).

fishing eagle = fish eagle.

fishing efficiency = the ratio of number of fish caught to the number present in the area fished.

fishing effort = 1) the total fishing gear in use for a specified period of time, expressed as trap hauls for example; when two or more kinds of gear are used, they must be adjusted to some standard type before being added. Successful adjustment should make effort proportional to fishing mortality rate (F), twice the effort giving double the F.

fishing effort = 2) effective fishing effort, abbreviated as f or  $f$  (Ricker, 1975).

fishing effort = 3) the amount of time and fishing power used to harvest fish. Fishing power includes gear size, boat size, electronic gear, and horsepower. May be expressed as days away from port, boat days, hours trawling, length of drift net, etc.

fishing effort = 4) a measure of resource use by anglers, e.g. number of angler hours, party hours, boat hours, trips on the water. Also called fishing pressure.

fishing establishment = the branch of a fish merchant in a coastal settlement, headquartered in St. John's, Newfoundland or Britain, in charge of taking and shipping the catch in exchange for supplies to the fishermen.

fishing expedition = 1) an extended fishing trip.

fishing expedition = 2) an investigation made with the hope of discovering information but without any clear evidence at hand when begun.

fishing exploitation = the combination of methods and activities which yield a catch with the use of different gear.

fishing fleet = 1) an aggregation of fishing vessels of a particular country or using a particular gear, e.g. a purse seine fleet, the West Country-Newfoundland migratory fishing fleet.

fishing fleet = 2) a group of women arriving en masse at a colony in search of husbands (archaic). Those who failed to find a husband were termed "returned empties", e.g. the British in India.

fishing float = a scow used in seining, movable between fishing grounds.

fishing for compliments = seeking praise.

fishing frog = an angler fish (*Lophius piscatorius*) of Europe, and related species.

fishing gear = the equipment used for fishing, e.g. gillnet, handline, hook and line, harpoon, seine, longline, midwater trawl, purse seine, rod-and-reel, traps, trawl, spears, etc. but not vessels.

fishing ground = an area in a water body where fish congregate and where fishing is good.

fishing height = the vertical opening of a trawl net.

fishing hole = 1) a favoured spot on a lake or in a river for fishing.

fishing hole = 2) a hole cut through the ice of a river or lake for fishing.

fishing industry = includes both recreational, subsistence and commercial fishing, and the harvesting, processing, and marketing sectors.

fishing intensity = 1) effective fishing effort.

fishing intensity = 2) fishing effort per unit area (must be proportional to fishing mortality through the relation  $F = q(f/A)$  where  $(f/A)$  is the fishing intensity and "q" the catchability coefficient).

fishing intensity = 3) effectiveness of fishing.

fishing jack = a schooner-rigged, decked vessel of from 5 to 24 tons.

fishing kit = a small packet of toiletries, including toothpaste, a toothbrush, soap and deodorant, that are issued to new prisoners in the Los Angeles County jail (prison slang).

fishing lead = a lead weight used in hook-and-line fishing to sink the bait rapidly to the appropriate depth.

fishing ledge = an elevated underwater feature frequented by cod (Newfoundland).

fishing light = one of several lights, legally required, that a vessel must show while fishing.

fishing light attractor = an underwater light used to attract fish including both bait and larger fish. These lights also produce heat, which helps in the attraction. Variously legal or not depending on jurisdiction. Also called green light or green fishing light from the colour emitted.

fishing line = a line with hooks used to catch fish. The line is usually a monofilament made from nylon, perlon or teflon but can be a braid.

fishing lodge = an establishment on a lake or river set up to serve anglers, offering accommodations, gear and guides, in North America.

fishing lure = a natural structure attractive to fish, e.g. the modified mantle of mussels or clams which resembles a small fish, and thus attracts a larger, predatory fish. The larval glochidia of the mussel can then attach to the predator as it tries to strike the lure.

fishing mortality = deaths or removal of fish from a population due to fishing. Usually expressed as the annual mortality, the percentage of fish dying in one year, or the instantaneous rate F, the percentage of fish dying at one time. F can range from 0 for no fishing to very high values such as 1.5 or 2, where 1.5 or 2 times as many fish have been caught as were present at the beginning of the fishing season (this is only possible with short-lived, fast growing species such as anchovies). Most mortality ends up in the catch but some fish are discarded and others are killed but not caught. Limiting the catch is used by fishery managers to control fishing mortality.

fishing mortality rate = the fraction of an initial stock which would be caught during the year (or season) if no other causes of mortality operated. Usually expressed as an instantaneous rate (the percentage of fish dying at any one time) and can reach 2.0 or higher. May be expressed as an annual rate (the percentage of fish dying in one year). Doubling the effort will double the catch but eventually increased effort drives down the stock's biomass. Abbreviated as F. Also called conditional fishing mortality rate.

fishing net = net (an open mesh structure formed by cords linked by knots (or other linking methods such as weaving) used for capturing or confining aquatic organisms like fishes).

fishing operation = the process of catching fish from travel to and from the fishing grounds, searching for fish and catching fish.

fishing owl = a fish-eating owl of the Old World genera *Scotopelia*, *Bubo* and *Ketupa*. Pel's fishing owl, *Bubo peli*, of Africa, is said to make the sound of "a lost soul falling into the bottomless pit".

fishing party = 1) a group of anglers, usually on a hired boat.

Fishing Party = 2) an environmentalist political party in Australia, with an emphasis on access rather than strict preservation. Motto:- I Fish and I Vote.

Fishing Party = 3) a Scottish political party formed mostly to protest quota cuts as a result of the European Union Single Fisheries Policy.

fishing pattern = 1) the way in which fishing operations are conducted.

fishing pattern = 2) distribution of fishing mortality among age groups.

fishing period = a time period of the fishing season related to catches of a given species and the gear used.

fishing pit = a deeper hole or sump in a fish pond where fish gather and can be caught.

fishing place = 1) a fishery.

fishing place = 2) a convenient place for fishing.

fishing place = 3) a place where fishes are caught with seines.

fishing place = 4) the exact locality on a fishing ground where the fish are caught.

fishing plantation = an area of foreshore and its buildings in Newfoundland set aside for the landing and curing of fish.

fishing pole = 1) fishing rod.

fishing pole = 2) an item, such as a rolled up newspaper, used to facilitate a "fishing line", a line used to pull items from one cell to another (prison slang).

fishing pond = a pond in which fish are kept or reared.

fishing post = fishing station.

fishing power = the catch which a particular gear or vessel takes from a given density of fish during a certain time interval. Larger vessels have a greater ability to catch more fish and thus have greater fishing power. Also, improvements in a vessel or gear, such as fish finders, Loran, etc., can increase fishing power. Depends on the area or volume affected by the gear, relative to the total area covered by the stock ( $a/A$ ), the number of animals present in that area or volume relative to the total stock ( $n/N$ ), and the proportion ( $p$ ) of the animals present in that area or volume which can effectively be captured by the gear. If the stock ( $N$ ) were randomly distributed in the distribution area ( $A$ ), the proportion of the stock present in the sector affected by the gear ( $n/N$ ) would be equal to ( $a/A$ ) and the catch would be ( $pa/AN$ ).  $p(a/A)$  will give a direct measure of fishing mortality.

fishing premises = the waterfront stores, sheds, wharf and other facilities belonging to a merchant in the Newfoundland cod fishery.

fishing pressure = 1) quantity of fish caught per hectare.

fishing pressure = 2) a measure of resource use by anglers, e.g. number of angler hours, party hours, boat hours, trips on the water. Also called fishing effort.

fishing pressure = 3) the effect of angling on a fish population.

fishing pump = used to catch fish attracted by lights, but not to transfer fish already caught.

fishing punt = an un-decked boat, 20-25 feet long, round-bottomed but keeled, propelled with oars or a sail, and used in the cod fishery in Newfoundland.

fishing rack = the unit on which tuna fishermen stand, a removable outboard platform.

fishing rate = the ratio between the number of fish caught and the number of fish in the stock.

fishing region = a large area where fishing occurs.

fishing regulations = measures to protect a species and its environment, e.g. banning fishing during the spawning period.

fishing right = a right to catch a specified quantity of fish, a proportion of the total allowable catch, to use a boat or any other specified fishing equipment, in a manner specified in a management plan or in fishery regulations.

fishing rod = 1) a device to carry and project a fishing line, hook(s) and bait or lures. The construction of rods is both a craft and a science and there is an immense variety for particular species. Originally made of wood (split cane), now made of fibreglass, graphite/fibreglass or kevlar

fishing rod = 2) a penis (slang).

fishing room = a lot on a beach used as a base by fishermen and where drying of the catch is carried out (Newfoundland).

fishing salt = a kind of coarse salt used to cure fish. Also called fishery salt.

fishing season = the time of year when certain fishes are caught with specific gear.

fishing shallop = a large, partly-decked boat used in the inshore cod and seal-fisheries of Newfoundland.

fishing skiff = a large undocked boat of up to thirty feet long, used to set and haul nets or traps in Newfoundland.

fishing smack = any of various fore-and-aft-rigged fishing vessels of rather large size, often containing a well to keep the catch alive. Used to collect fish from fishermen for shipment (Newfoundland).

fishing space = the space between the head and the base of a railroad rail for seating the fish plate, *q.v.*

fishing spider = spiders of the family Pisauridae able to run across water on the surface tension and some will go underwater to hunt prey such as small fishes.

fishing spread = the horizontal opening of a trawl net (rather than its vertical height).

fishing stage = a shed near the shore or built out over the water for landing, cleaning, salting and storing fish in Newfoundland. It contained a splitting table, tools, fishing gear, etc.

fishing stake = a pole used to support a stake net, *q.v.*

fishing stamp = a government form in Newfoundland issued by a fish-dealer recording amount of unemployment benefits due to a fisherman.

fishing stand = fishing station.

fishing station = a small sheltered cove or harbour from which seasonal fishing operations were conducted in Newfoundland. Fishing rooms were set up there. See also fishing stand and fishing post.

fishing success = catch per unit effort (catch in numbers or weight taken for a given amount of fishing effort expressed as a ratio; the more recent form is catch/effort (C/f). Also called availability).

fishing tackle = the equipment used to catch fish, usually that used by anglers. Also called tackle.

fishing taum = an angling line (archaic).

fishing time = 1) time spent at sea fishing productively.

fishing time = 2) the actual time of day, month or year spent fishing.

fishing to hand = in angling, using a pole with the rig of the same length so fish can be swung in or netted without needing to dismantle sections of the pole.

fishing tool = a device for removing objects from inaccessible places.

fishing tow = an angling rod and line (Norfolk dialect).

fishing trip = 1) a vacation involving sport fishing.

fishing trip = 2) a batter in baseball who swings at a pitch outside the strike zone. Also called going fishing.

fishing tube = a glass tube used to select microscopic objects in a fluid; nothing to do with fish.

fishing twine = cord used to make fish nets.

fishing unit = the gear, processes and people that together can fish autonomously.

fishing vessel = a boat, ship or other craft that is equipped and used for fishing or in support of such activity with a capacity of 5 net tons or more.

fishing voyage = a period of fishing or the fishing enterprise (Newfoundland).

fishing wand = fishing rod (Scottish).

fishing waters = waters used for angling or commercial fishing.

fishing with feet = locating fish by shuffling through bottom sediments with the feet and then seizing them by hand.

fishing with otters = using trained otters to scare fish into a net or towards a fisherman, or even to retrieve fish.

fishing worm = an earthworm used as bait in angling. Also called fishworm.

fishing zone = a zone of variable width (up to 200-nautical-miles) proclaimed by a coastal State around its coast, within which it controls domestic and foreign access to fish resources.

fish-ing- = as with fish a prefix-like word which may have entries or terms that may be found under the second word.

fishing-taum = an angling line (archaic).

fishings = a fishery.

fishjoint = 1) a joint formed by fitting a wedge into a v-slot or a w-slot.

fishjoint = 2) a joint where two abutting units are held together by a fish plate, *q.v.*

fishkeeper = may mean either pondkeeper, *q.v.*, or aquarist *q.v.*

fishkeeper's granuloma = an infection in humans with the bacteria causing fish tuberculosis (a *Mycobacterium*, but not the same as the one causing human tuberculosis). It is probably the only zoonosis of note to aquarists. It appears as a skin infection, usually on the hands or forearms where there was an earlier cut, and may be inflamed, suppurating, encrusting and irritated. Not usually serious unless the infected individual is already immuno-suppressed. Treatment requires antibiotics. Also called fishtank granuloma.

fishkettle = a long kettle for boiling fish whole, often with a removable grid so the fish can be removed in one piece without it falling apart.

fishkill = a die off of fishes within a relatively short period due to the onset of man-caused or, more rarely, natural factors, e.g. pesticide related mortalities, red tides, drought. See also winterkill and summerkill.

fishkiller = an aquatic insect of the family Belostomatidae, e.g. *Lethocerus americanus*, which feeds on small fishes.

fishkiller tree = a member of the brazil nut family, Lecythidaceae, *Barringtonia asiatica*, containing saponins in the leaves which are ground and thrown into water to paralyse fish.

fishkini = a bikini made of tilapia fish skin (Thailand).

fishknife = 1) a small knife with an ornamental upper edge used in eating fish along with a fork.

fishknife = 2) a large knife with an ornamental upper edge and a broad blade used in serving fish with a large fork.

fishladder = a series of steps with flowing water and pools enabling a fish to circumvent an obstruction such as a dam or waterfall by leaping from step to step. Also called fishway, fish pass.

fishlaid = split veneer used for filling in the manufacture of plywood.

fishlead = a type of sounding lead used without being removed from the water between soundings.

fishlet = a very small fish (rare).

fishless = having no fish, a deplorable state.

fishless cycling = a method of maturing (or cycling) a new biological filter using chemical means rather than adding fish. The process involves stimulating growth of beneficial bacteria on the filter using a pollutant as an energy source for the bacteria and then waiting weeks for the bacterial colony to reach full size.

fishlice (singular louse) = parasitic crustaceans on marine and freshwater fishes. The common ectoparasite is *Argulus* (Branchiura) which can move around on its host, causing several wounds. May result in lethargy, loss of appetite, anaemia through blood loss, osmotic stress and secondary infections. The effects of irritation are restlessness, darting, jumping, scratching and overproduction of mucus. Various chemical treatments of aquarium water will remove the parasite although they are often large enough to be picked off with tweezers as long as a topical antiseptic is applied to the wound site.

fishlift = fish way.

fishlike = like fish, suggestive of fish; having some of the qualities of fish.

fishlike = like fish, suggestive of fish; having some of the qualities of fish.

fishline = a line made of twisted hair, silk, monofilaments or other material used in angling.

fishling = a small or young fish (rare).

fishlip = to slobber on the end of a marijuana cigarette.

fishlock = a fish weir, in the sense of a dam forming a retaining reservoir harbouring fishes.

fishlopaedia = an encylcopaedia of fishes, a contrived word.

fishlore = study of fishes; ichthyology.

fishlouse = any crustacean parasitic on fishes. Often refers to *Argulus* (Branchiura) found on the skin and occasionally the buccal cavity. Causes ulcers at the attachment point.

fishly = like fish, fishily.

FishMac = Filet-O-Fish.

fishmagnet = a moveable electrode used to bring up a school of fish that normally is too deep for a purse seine to catch.

fishman = 1) a person cleaning fish as food.

fishman = 2) a seller of fish.

fishman = 3) a fisherman.

fishman = 4) a student of ichthyology.

fishmanure = dried and powdered fish used as fertiliser in fish ponds to enhance productivity.

fishmarket = 1) any area selling fish but usually refers to a large covered establishment with diverse products. Famous fish markets include Billingsgate (London), Tsukiji (Tokyo) and Fulton (New York), all q.v.

fishmarket = 2) the lowest hole at bagatelle.

fishmeal = dried fish or fish waste used as fertilizer, animal food or ground fine for use in soups. May be defatted, and is powdered or granular in form.

fishmeter = an officer of the Fishmongers Company.

fishmill = a circularly swimming mass of fishes, usually formed only by obligate schoolers.

fishmint = aquatic or moist-growing mints (*Mentha aquatica* and *M. longifolia*).

fishmonger = a dealer in or seller of fish.

fishmite = a parasite infesting salt fish.

FISHmode = FISH queue.

fishmold = a water mold growing on fish (saprolegniasis, a fungal infection from *Saprolegnia* and *Achlya*, usually a secondary infection after skin damage or scale loss but also affecting eggs in hatcheries).

fishmonger = 1) a dealer in or seller of fish.

fishmonger = 2) a bawd, presumably a corruption of flesh monger, dating from the mid-sixteenth century.

fishmonger = 3) a pimp (slang since the 1500s).

fishmonger = 4) a lecher or whoremonger (1800s Britain).

fishmonger's daughter = a whore; slang from late sixteenth century.

Fishmongers Company = Worshipful Company of Fishmongers (a livery company (trade association) of the City of London with a royal charter dating back to the thirteenth century. It had a monopoly over sale of fish in the City and now inspects all fish sold).

fishmouth = 1) turtlehead, a perennial North American herb (*Chelone glabra*).

fishmouth = 2) an opening at the exposed edge of a roofing ply sheet where the asphalt bond is lacking or the felt is wrinkled.

fishmouth incision = a wide and horizontal incision made on the tip of the finger to drain an abscess.

fishmouth meatus = a medical condition in humans; a red and swollen and everted condition of the orifice of the urethra (meatus) in the first stage of acute gonorrhea.

fishmouth stenosis = an extreme medical condition in humans describing the narrowing and ineffective opening of the mitral valve of the heart.

fishnet = 1) any net used to catch fishes.

fishnet = 2) any material having the open mesh pattern of a fishnet, e.g. women's stockings.

FISHnet = 3) nothing to do with fish; computer slang for "first in, still here" referring to slowed or stopped processes, in this case on a network.

fishnet = 4) the shape of the city of Wung-chun, China, laid out in this shape to be viewed from above. See also carp.

fishnet = 5) code name for Bismarck, Admiralty and north New Guinea operations in World War II.

fishnet buoy = a buoy marking the limit of fish net.

fisho = 1) a person who fishes.

fisho = 2) a street vendor selling fish.

fisho = 3) a fishmonger.

Fisho = 4) a Malaysian business and franchise which uses doctor fish (*q.v.*) to clean dead skin from humans.

fishocracy = used in reference to merchants in St. John's, Newfoundland, mostly in the 1910s and 1930s, but still used to denigrate a merchant group whose scheming was believed to hinder development of the fishery.

fishoil = any oil obtained from fishes, usually from the liver, but in fatty fishes from the body, or from fish wastes. Used in fish feeds, edible fats, soaps, paints, leather work and making linoleum.

fishout = 1) exhaustion of the fish supply in a water body; to denude an area of fish.

fishout = 2) to remove an object from a receptacle or from water.

fishpass = 1) fish passage facility.

fishpass = 2) a cut dredged through a barrier island allowing tidal flushing and movement of fish.

fishpaste = fish mixed with salt and ground to a fine consistency with or without added fat, spices and other seasonings. Should contain 70% or more fish. Used as a sandwich spread.

fishpearl = a glass bead coated with essence d'Orient, *q.v.*, to make an artificial pearl.

fishpen = an enclosure in the water for aquaculture made of netting on a frame; it serves to keep desired fish in and unwanted species out.

fishpest = any deadly epidemic disease of fishes.

fishpie = fish, minced and baked with potatoes, and sometimes mixed with vegetables, in a pastry.

fishpiece = fish (9) a piece of timber used to strengthen a mast or spar when sprung, often somewhat fish-shaped).

fishpier = a pier for fishing boats to tie up at.

fishplate = 1) one of the plates of a fish joint, *q.v.* Strengthens a joint by overlapping, e.g. a flat piece of metal connecting railway rails to the ties or connecting pieces of masonry.

fishplate = 2) the perforated drainage grid of a fish kettle, *q.v.*

fishpole = fishing rod.

fishpond = 1) a freshwater pond in which fish are kept.

fishpond = 2) an enclosed or gated coastal body of water used in aquaculture, e.g. in Hawaii for milkfish and bonefish. Fish enter on tides, through a gate or are stocked.

fishpond = 3) the sea (jocular).

fishpond = 4) a depression in a card table where fish-shaped counters are kept.

fishpond = 5) an attraction at a fair where miniature fishing gear is used to hook fish-shaped tokens from a small pool to win prizes.

fishpond = 6) the female genitalia (U.S. slang, mid-1900s).

fishpool = fishpond, a pool containing fish.

fishpot = 1) a portable cage-like trap which fish enter through a small opening and from which they cannot readily escape because of the funnel shape. May be baited or not, made of various materials, of various sizes and shapes, and of various local names from country of use or species of capture, e.g. eel pot, Scottish creel. Used to catch crabs, lobsters and occasionally fishes.

fishpot = 2) a junk fishing boat.

fishpot = 3) NATO code name for a Soviet SU-9 jet fighter.

fishpound = a net or fence set in streams or along the coast to direct fish into a holding container for easy removal. Also called trap net or setnet.

fishpox = carp pox (one of the oldest known fish diseases found in cultured carp, other cyprinids, pike-perch and aquarium fishes. It is caused by *Herpesvirus cyprini*. Also known as carp papillomatosis, epithelioma papulosum, fish pox, cyprinid herpesvirus I (CHV). Skin lesions appear as the water temperature drops in winter as small milky-white spots that merge and cover large skin areas).

fishrake = a set of hooks attached to a structure such as an iron bar up to 8 metres wide towed behind a boat and impaling any fish encountered.

fishrange = a place for catching and drying fish.

fishroom = 1) fish hold (an enclosed space on a vessel for storing fish; may be insulated and/or refrigerated).

fishroom = 2) a piece of land by the shore from which a fishery was conducted in Newfoundland.

fishroom = 3) the stages. *q.v.*, flakes, *q.v.*, stores, crew and family housing, and other facilities where a fish catch was landed and processed in Newfoundland.

fishroom = 4) a small building for storing dried and salted cod in Newfoundland.

fishroom = 5) fish top (a movable box-like structure to cover piled cod-fish. Also called fish house).

fishrope = fish fall.

fishrun = a group of fish migrating up a river, usually for spawning.

fishsan = fish sandwich.

**fishscale** = 1) any pattern or design resembling fish scales. See fish scales.

fishscale = 2) a fish's scale.

fishscale = 3) slang for uncut cocaine.

fishscale disease = ichthyosis (a congenital skin disease in humans where the epidermis becomes hard, rough and scaly. Also called fishskin disease).

fishscale gallbladder = a gallbladder with a fish scale-like appearance due to multiple small cysts of the mucosa.

fishscale tile = a tile shaped like a fish's scale.

fishscales = 1) a grain pattern in leather resembling the scales of a fish. Once used by bookbinders who wanted a leather giving the effect of being blind tooled.

fishscales = 2) a scale pattern on the bottom of waxless skis which helps prevent the skis from sliding backwards.

fishscope = the cathode ray tube element of a fish finder.

fishscrap = fish remains after oil has been extracted; often used as fertiliser. Also called fish pomace, fish waste.

fishscreen = 1) a screen across a body of water or structure, e.g. the turbine intake of a dam, designed to divert the fish into a bypass system.

fishscreen = 2) a grating or mesh positioned in a river to strain fish from the water. Fences or netting direct fish onto the screen where they run aground while the water drains through the mesh.

**fishscrew** = a device for pressing dried cod into a cask or barrel.

fishseed = 1) fertilised eggs, fry or fingerlings used for growing in aquaculture facility or for stocking grow-out areas.

fishseed = 2) kokkel-seed or lice-seed, the fruit of *Anamirta cocculus* a creeping shrub of Asia. Contains pikrotoxin used in small pellets of dough thrown in the water to stupefy fish eating them.

fishshed = fish house (Maritime Canada).

fishskin = 1) the skin of a fish.

fishskin = 2) a condom.

fishskin = 3) a dollar bill.

fishskin disease = ichthyosis (a congenital skin disease in humans where the epidermis becomes hard, rough and scaly. Also called fish-scale disease).

fishskin grain = a grain in leather resembling fish skin.

fishskinner = a ridged roller to remove fish skin and scales. There are small hand-operated models for sport fishermen and hand-operated or powered models for skinning fish on a commercial scale (no pun intended).

fishslice = 1) a broad knife for lifting and dividing or carving fish at a table.

fishslice = 2) an implement used by cooks for turning fish in a pan.

fishslide = an inclined structure of box-like shape set in a stream at a ripple or small waterfall to catch descending fish.

fishspear = 1) a spear with 3-5 prongs on the end in various arrangements used to capture fish.

fishspear = 2) a trident with barbs or flukes is the symbol for the staff of Greek Poseidon or Roman Neptune, gods of the sea.

fishspinner = a hurricane, cyclone or typhoon.

fishstake = one of a series of poles or stakes placed in shallow water to outline fishing areas.

fishsteak = a cross-section slice of a large, dressed fish.

fishstew = a small pond where fish are kept for eating, now obsolete. Also called vivarium.

fishstick = 1) fish marketed in the form of rectangular sticks cut from a block of frozen fish fillets, breaded, fried in fat, or sold frozen for cooking. See also goujonettes de sole and fish finger.

fishstick = 2) a fish spear with a single point.

fishstock = 1) a distinct genetic population, a population defined by movement pattern, part of a population potentially harvestable, or a quantity of fish from a given area; usually isolated from other stocks of the same species and so self-sustaining. May be a total or a spawning stock.

fishstock = 2) used for steaming fish; made of lightly salted cold water, bones and trimmings of fish, seasonings, simmered for half an hour, strained when almost cold and a little white wine or vinegar added.

fishstore = 1) a store selling fish.

fishstore = 2) a building where dried cod from the offshore fishery is stored for collection or export (eastern Canada). Also used to store gear in winter and spring and as a place to mend nets.

fishstove = fish stew.

fishtackle = 1) wire tackle for emptying the cod end of a trawl, stronger than gilson tackle.

fishtackle = 2) equipment to raise the flukes of an anchor to the gunwale. Also called fish block.

fishtail = 1) the tail or caudal fin of a fish.

fishtail = 2) any device shaped like a fish tail.

fishtail = 3) the uncontrolled movement of the rear end of a vehicle, e.g. on snow or ice.

fishtail = 4) to swing the tail of an aeroplane from side to side in order to reduce speed.

fishtail = 5) an arrow wobbling in flight.

fishtail = 6) a turning ballroom step.

fishtail = 7) code name for Gig, New Guinea operations in World War II.

fishtail bit = a drilling bit shaped like a fish's tail.

fishtail burner = a type of gas burner, having two openings in the top, from which the jets of gas issue and form a flat flame, the plane of which is at right angles to that of the openings.

fishtail cutter = a cutter for milling slots and keyways.

fishtail dress = a type of dress that has a section that is closely gathered or pleated and then flares out.

fishtail skirt = a type of skirt that has a section that is closely gathered or pleated and then flares out.

fishtail lawyer cane = a palm of the Arecaceae family, *Calamus caryotoides* from northern Queensland.

fishtail palm = a palm of the Arecaceae family in the genus *Caryota* from tropical Asia.

fishtail point = a fluted and stemmed, fishlike stone tool from South America dating to 11,000-8000 B.C.

fishtail propeller = a propeller with a single blade that oscillates like the tail off fish when swimming.

fishtail wind = a variable wind that blows across shooting ranges.

fishtank = 1) a fish or water holding structure of varying size and construction material, from an aquarium to a large outdoor pond.

fishtank = 2) in a museum, a large, often rectangular container for storing fluid-preserved specimens. Usually of stainless steel as wood and plastic containers eventually deteriorate.

fishtank = 3) a cabinet of microfiches.

fishtank granuloma = fishkeeper's granuloma.

fishtape = flexible, flat metal wire used to pull other wires through conduits or wall spaces.

Fishtar = critic's name for "Waterworld", a 1995 post-apocalyptic science fiction movie starring Kevin Costner, in reference to another flop "Ishtar".

fishtongue = 1) long-handled tongues used for catching fish or for holding slippery or dangerous fish such as moray eels.

fishtongue = 2) a device for removing wisdom teeth, named for its shape.

fishtongue = 3) a commercial product, often marketed with fish cheeks, fresh, frozen or cured.

fishtop = a movable box-like structure to cover piled cod-fish. Also called fish house and fish room.

fishtorpedo = a torpedo resembling a fish in shape.

fishtrack = fossilised remnants of fish moving over the bottom; traces of pectoral and other fins. Also called ichthyopatolites.

fishtrap = a spring-loaded trap made of netting on a frame that closes over a fish. The two rectangular halves of the trap are spread apart from the central spring mechanism. The fish is attracted by bait or a dummy fish that the fish sought tries to fight, e.g. a wooden male salmon painted in spawning colours. See also shutter trap.

fishtrap boat = herring weir seine boat (an open boat about 28 feet long with an inboard motor. Has three man crew and is used to tend herring seines, traps and weirs).

fishtrowel = 1) a fish slice or fish carver having a trowel shape.

fishtrowel = 2) a gardener's tool shaped like a scoop.

fishtrowel = 3) a tool used for smoothing a mold.

fishvan = 1) a light spring-cart for carrying fish.

fishvan = 2) a railway truck dedicated to fish transport.

fishwarden = an official who enforces game laws relating to fish.

fishwaste = 1) fish that are caught but do not have market value as food, fish parts as a by-product of the production process. May be used for fish meal, fish oil, pet food, hatchery food, animal food, and other byproducts.

fishwaste = 2) fish remains after oil has been extracted; often used as fertiliser. Also called fish pomace, fish scrap.

fishway = fish ladder.

fishweed = pondweed (*Potamogeton*).

fishwheel = a series of lift nets on a wheel frame that is rotated by the river current, catching migrating fish and dumping them through a chute into a basket.

fishwich = fish sandwich.

fishwife = 1) a woman who sells fish.

fishwife = 2) a foul-mouthed coarse, abusive woman.

fish wife = 3) the female wife or consort of a homosexual male (U.S. slang, mid-1900s onward).

fishwoman = a woman who retails fish. Also a fishwife.

fishwood = 1) Jamaican dogwood or Florida fish-poison tree (*Piscidia piscipula* (Fabaceae, pea family), also called fishfuddle tree. Not a member of the dogwood family. Seminoles in Florida used a powder made from its roots, bark, and leaves to stun fish. See also fish poison tree.

fishwood = 2) *Euonymus americana* (Celastraceae) or strawberry bush of eastern North America.

fishworm = 1) a parasitic worm of fishes.

fishworm = 2) an earthworm used as bait in angling. Also called fishing worm.

fishy = 1) related to or like fish, of fish, fishlike; having the qualities or taste of fish.

fishy = 2) abounding in fish.

fishy = 3) consisting of fish, produced from fish.

fishy = 4) extravagant, like some stories about catching fish, improbable.

fishy = 5) rank or foul.

fishy = 6) doubtful, dubious, unconvincing, questionable, suspect, seedy, effete, indisposed.

fishy = 7) dull or vacant looking eye.

fishy = 8) lacking warmth or passion.

fishy = 9) of questionable character.

fishy = 10) morally or financially dubious.

fishy = 11) intoxicated with alcohol.

fishy = 12) a little fish. Also spelled fishie.

fishy about the gills = appearing recently drunk (Cockney).

fishy bee = a bluebottle fly (Scottish dialect).

fishy death of kings = 1) a surfeit of lampreys, the meal that reputedly killed Henry I of England in 1135. The flesh is said to be fatty and not easily digested.

fishy death of kings = 2) Edward IV of England died in 1483, from a chest infection, caught while fishing on the River Thames. Pneumonia resulted and, with pleurisy, finished him off although rumour at the time thought poison was the cause.

fishy eye = a glazed eye.

fishy flee = a bluebottle fly (Scottish dialect).

fishy pea = fish pea.

fishyback = the movement of freight containers by water (in counterpoint to piggyback).

Fishzilla = a nickname for exotic snakeheads (Channidae) introduced outside their natural habitats based on their predatory habits and ability to move over land.

fissura (plural fissuræ) = fissure.

fissuræ = plural of fissura.

fissure = 1) any groove, notch or furrow in a bone.

fissure = 2) a deep and narrow depression cutting across a reef front.

fit = 1) fit-out.

fit = 2) making netting into net or trap (Newfoundland).

fit-out = clothing and gear for a commercial fishing expedition (Newfoundland).

five-leg = a net mesh made with five sides by mistake (Newfoundland).

fixation = 1) in taxonomy, a general term for the determination of species, whether by designation (original or subsequent), or by indication, *q.v.* fixation by elimination is the supposed fixation of a type species by the subsequent transfer of all but one of the originally included nominal species from a genus, not in itself an available method of type fixation.

fixation = 2) the process of preserving tissues of a specimen from decay by coagulating the proteins and destroying bacteria that would cause decomposition; usually formalin (*q.v.*) is used with fishes.

fixation by elimination = the supposed fixation of a type species by the subsequent transfer of all but one of the originally included nominal species from a genus. Not in itself an available method of type fixation.

fixative = the chemical used in fixation (2).

fixed = 1) act of making a type fixation.

fixed = 2) the condition of specimens preserved against decay; see above for both.

fixed gear = any net or trap anchored or buoyed in a stationary position.

fixed gillnet = a gillnet fixed on stakes in coastal waters, the fish being collected at low tide.

fixed paternoster = an angling rig comprising a weight or feeder attached to a 15-30 cm length of line (the link) which is itself tied to the main line above the hooklength. Used in match fishing and general coarse fishing.

fixed-spool reel = the commonest form of reel used in angling. A bail arm winds the line onto the spool which does not move. Folding the bail arm back enables the line to be cast off the spool.

fjord = fiord.

FL = abbreviation for fork length.

fl oz = abbreviation for fluid ounce.

fl oz<sub>BI</sub> = abbreviation for Imperial fluid ounce (28.413 millilitres or cm<sup>3</sup>).

fl. = abbreviation for *floruit*.

*fl.* = fl.

flaag = flag (2).

flabellate = fan-shaped.

flabelliform = fan-shaped.

flacket = faggot.

flag = 1) refers to the state in which a vessel is registered.

flag = 2) a shoal of fish (Shetland Isles dialect). Also spelled flaag.

flag = 3) a flag flown from a sport fishing boat to indicate to observers on shore that a significant catch of that species had been made. Usually a coloured drawing of the fish species.

flag line = a drift line for tuna with each float bearing a flag.

flag side = the flesh side of a split haddock as opposed to the skin side with the backbone (Scottish dialect).

flag state = the state under whose laws a fishing vessel is licensed or registered.

flagship species = a highly recognisable species that serves to focus attention on a particular place in relation to habitat conservation. The species can be an endemic, significant in an evolutionary or ecological sense, or even just attractive to humans aesthetically, in sport or in history.

flake = 1) an outdoor platform or rack for drying fish, often of spruce boughs on a framework of poles in North America. The boughs stopped the fish from being "burned" by the wooden frame or longers. Some fish were laid directly on beach rocks, a bawn. See also hand flake.

flake = 2) commercial name for dogfish (*Squalus acanthias*) in Britain; used as more appetising than the real name. Also used in Australia for several small shark species used in fish and chips such as the gummy shark, *Mustelus antarcticus*.

flake = 3) a dried food for aquarium fishes of various composition and designed for a wide variety of aquarium species or specific feeding types of fish. See also TetraMin.

flake = 4) commercially, a mixture of particles of fish in which the muscle structure is retained.

flake = 5) one of a series of myomeres (*q.v.*) that separate when cooked.

flake = 6) cooked haddock or cod flesh broken up into flakes and then canned.

flake bough = a branch of a spruce or fir tree spread on the flake (*q.v.*) to allow air to circulate and help dry the fish.

flake room = space near the shore for building flakes.

flaked cod = fibred cod.

flakes = cooked haddock or cod flesh broken up into flakes and then canned.

flank = the side of a fish.

flap = nape (the thickest part of a fish fillet, just behind the head on each side of the backbone).

flapper = a loose piece of netting arranged as a valve to prevent escape of fish from the cod-end of a trawl.

flaring = a behaviour of fish in which the opercula and fins are extended fully, e.g. *Betta splendens* males in response to other males (or a mirror).

flash = 1) a small pond in marshy area (Newfoundland).

flash = 2) to increase the flow of water in a river or channel.

flash = 3) a large, shallow, open body of water (England).

flash flood = a flood caused by heavy rainfall not absorbed by the land; often destructive of fish and fish habitats.

flash freezing = very rapid freezing of small pieces of fish. Also called snap freezing.

flashabou = a commercial name for colourful synthetic material used in fly tying to add flash to streamers (*q.v.*) and other patterns.

flasher = 1) a bright, reflective piece of metal attractive to fish and used by trollers.

flasher = 2) a sonar system used in ice fishing to give depth information and to indicate presence of fish.

flashet = flash (1).

flashing = a quick, half-spin movement when the fish rubs itself against a surface, e.g. tank base or cage side, the flash being caused by the light reflecting off the flank or abdomen of the fish. Fish typically exhibit flashing when their skin is irritated by ecto-parasites.

flasket = a wicker basket in which fish are packed.

flat = 1) a sand-, grass- or mud-bottomed area of uniform, shallow depth in fresh or marine waters, mostly exposed at low tide in the sea. May be some distance from shore. Fish may

come up from neighbouring deep areas to feed on flats or it may be a habitat for certain species such as bonefish.

flat = 2) lightweight, flat bottomed, square end and dory-like boat used in shallow brooks and easily portaged (Newfoundland).

flat punt = flatboat.

Flat River syndrome = a mile wide and six inches deep, said of some theories.

flatboat = a boat with a flat bottom used on calm waters such as a pond.

flatfish = 1) a dullard (slang, based on flat meaning stupid and fish meaning something to hook or catch).

flatfish = 2) any member of the laterally compressed fishes of the order Pleuronectiformes, which lie flat on the seabed. There are about 678 species in 14 families, the vast majority marine.

flattened = strongly depressed with the long axis in the horizontal plane, cf. compressed.

flatulence = see fast repetitive tick.

flavobacteriosis = a bacterial disease of freshwater and marine fishes caused by *Flavobacterium* spp., occurring sporadically in acute to systemic forms. A particular problem for the aquarium hobbyist. Infected fish become pale and emaciated, and white nodules develop in the brain and viscera (and may become mineralised).

flaw = a segment of fish flesh.

Fleckherring = herring split down the back like kippered herring, and hot-smoked (Germany).

fleet = 1) a group of vessels directed towards a specific fishery.

fleet = 2) rows of herring drift gill nets, or any nets strung together.

fleet = 3) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for bass.

fleet = 4) a single line with one hundred hooks attached at intervals used in fishing for cod (Newfoundland).

fleet = 5) a piece of the belly of a fish, especially that of a mackerel, cut into the shape of a fish for use as bait (Scottish dialect).

fleet fly line = a line with 12-20 hooks used for mackerel or young saithe (Scottish dialect).

fleet line = a line where the hook floats mid-way between the surface and bottom, and is carried clear of the anchored boat by the current (Scottish dialect).

fleet separation = processing plants are not allotted quotas, only boats, so that large companies do not monopolise the fishery.

fleet statistics = data on the fishing fleet used to measure and monitor fishing capacity.

fleeting = 1) the system of organising trawlers to work in a fleet, boarding the fish every day.

fleeting = 2) setting and securing a net from a boat but allowing it to drift with the current, thus covering more ground than in a single haul.

Flemish eye = a loosely-tied knot used by anglers to attach hooks to multi-strand wire, the looseness taking the pressure off the crimping sleeve that attaches the end of the wire back to the main line. Various websites have animated steps showing how to tie this knot.

flesh fin = adipose fin (a small fleshy fin lacking rays or spines but reinforced by actinotrichs posterior to the soft dorsal fins (rarely a hard ray or a few soft rays may be developed in the adipose fin of certain catfishes), e.g. in Salmonidae, Osmeridae, Argentinidae, Myctophidae, Ictaluridae, Percopsidae).

fleshy appendage = axillary process (a small triangular appendage or a modified scale at the upper or anterior base of a paired fin. Also called accessory scale, inguinal process or fleshy appendage. Functions apparently to streamline the fin when held against the body while swimming).

fletch = 1) one of four longitudinal portions cut from a halibut parallel to the backbone. Also called flitch.

fletch = 2) a boneless fillet from swordfish or tuna.

flew = a type of fishing net set on poles (Sussex dialect).

flewer = type of fishing boat of 8-20 tons used in the herring fish with flew nets (Sussex dialect).

flexible inputs = inputs to the production process, i.e., harvesting fish, that can be substituted for or by other inputs.

flexion = 1) one of three substages in the larval stage of fishes (the others being preflexion and postflexion, *q.v.*). The notochord begins to bend upwards as fin rays supports develop below the notochord. There is rapid fin ray development, change in body shape, ability to move and a change in feeding method.

flexion = 2) bending or closing of a joint.

flexure = a bending, e.g. of the vertebral column, found in both wild and cultivated fishes.

flick-tip = in angling, a flexible and shock-absorbing tip section on a long pole used in place of an elastic (*q.v.*) when fishing to hand (*q.v.*). A small plastic connector attaches the float rig.

flicker = a lead weight incorporated into a hook, used when fishing with a hand-line for cod near the surface of the water. When a fish was caught, it was flicked into the boat, hence the name (Newfoundland).

$F_{lim}$  = limit fishing mortality, a value above which fishing should be avoided. See also precautionary approach,  $F_{pa}$ ,  $B_{pa}$  and  $B_{lim}$ .

flip cast = flipping.

flipper = a flat limb without digits evolved for movement through water. This covers the fish fin too but the term is usually applied to mammals and turtles.

flipping = an underhand cast using a pendulum motion with a long rod to drop rather than cast sinking lures to fish in heavy cover.

flipping rod = flipping stick.

flipping stick = a telescopic, heavy fishing rod designed for flipping, usually about 2 m long, with a long butt, and a trigger reel seat. Also called flipping rod.

flit = fleet (5).

flitch = fletch.

float = 1) a cork, wood, glass, metal or plastic structure used to support or mark the position of a net. See also bombarda and glass float.

float = 2) a plastic, cork or wood device that enables a baited hook to be suspended in the water column and enables fish biting on the hook to be detected by movement of the float. Usually painted distinctively, e.g. fluorescent colours, particularly at the tip. Floats are attached to the fishing line through small holes at the bottom of the float or by means of silicone tubes slipped over the float with the line trapped between the tube and float. Split shot or some other weight is attached to the line below the float so that the line sinks and the float achieves a suitable level above the water and is sensitive to bites. Bites may be evidenced by the float zooming underwater, by wiggling movements, by a slight rise as a fish picks up bait off the bottom, and other subtle movements. Strikes can be made immediately the float moves or delayed to give the fish time to take in the bait - this varies with bait type, species of fish and sophistication of the individual fish. Immense number of types and materials used, some with carbon fibre stems and tips or heavy and stable lignum stems. Also called bobber in North America or waggler in Britain.

float = 3) gas bladder (a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, sound receptor, respiratory organ. Found in Actinopterygii. Often lacking in bottom fishes. Sometimes called swim bladder or air bladder, less appropriate terms).

float = 4) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for tunas.

float = 5) confusingly, a flicker.

float = 6) the swimbladder of a cod (Newfoundland).

float adaptor = a device allowing float changes without removing weights and hooks from the line. It is a small flexible sleeve of eyed rubber tubing that attaches the float to the line.

float drove = fishing for herring by means of nets supported by floats.

float fishing = 1) using a cork, wooden or plastic device to support the line, weights and bait, suspending them at adjustable depths.

float fishing = 2) traversing a river by watercraft while fishing; usually the boat drifts while the angler casts. A float-fishing trip may last for several days.

float legering = use of a float with a running leger such that a bait is fished on the bottom,

float line = 1) the upper line of a net with wood, cork or plastic floats, keeping that part of the net on the surface, *cf.* lead line.

float line = 2) the line used with a flicker.

float raip = the cork or float rope in a herring net.

float rod = a rod designed for float fishing. Common in Europe and much longer than most rods in North America at 4 m or more and used with much lighter tackle.

float rubber = a hollow sleeve of rubber or silicone which is slipped onto a float and through which the main line slides. The float can then be adjusted to fish at different depths.

float stop = a knot used in angling to stop a free running float on the main line from sliding further up that line. It allows the main line to travel freely through the guides. Various websites have animated steps showing how to tie this knot.

float tube = a device allowing an angler to float in lakes and slow rivers. Comprises an air-filled tube with a seat and back rest, the legs dangling and equipped with fins able to propel the tube.

floatant = an oily substance used to help flies and fly lines float. May be a liquid, paste or dry crystals.

floater = 1) fish hauled rapidly to the surface such that their air bladders expand and prevent them swimming back down if released.

floater = 2) a floating bait used by anglers, such as dog biscuits.

floater = 3) a flyfishing line designed to float on the surface of the water.

floater = 4) float.

floater = 5) a Newfoundland fisherman taking cod along the Labrador coast on schooners using traps rather than jigs.

floater fish = refers to cod caught off Labrador and shipped in salt to be further processed in Newfoundland.

floater fishery = a seasonal, small-schooner, mobile cod-fishery based in Labrador waters which used mostly cod traps. It was prosecuted by Newfoundland crews who remained aboard their schooners all summer, following fish from place to place. The crews generally brought their heavy salted catch back to Newfoundland to have it dried in the fall.

floater fleet = the ships and men engaged in the floater fishery.

floater trader = an itinerant buyer of cod who deals with the migratory schooner fishermen (Newfoundland).

floater-diver = a plug that floats when not being retrieved but runs below the surface when retrieved.

floating = in taxonomy, a taxon not classified in one or more ranks of the taxonomic hierarchy.

floating bottom line = a line with floats that fishes just off the bottom.

floating cage = a cage that has buoyancy supports used in fish culture.

floating dock = a dock for boats which is connected to vertical poles, allowing for the rise and fall of tides.

floating feed = feed pellets in aquaculture formed by an extrusion process and designed to float for extended periods.

floating fish box = a cage for holding fish, equipped with floats so it is suspended in the water.

floating gill net = a gill net anchored to the sea bed or attached to a boat or other structure but positioned in midwater or near the surface.

floating jig head = a jig with buoyant material used to suspend live bait off the bottom.

floating long line = a suspended line with hundreds of coarse hooks forming a curtain which snag any fish trying to swim through it, e.g. migrating sturgeon.

floating mop = a tightly tied mass of synthetic yarn in various configurations with cork or styrofoam used as a spawning medium in aquaria for fish that normally lay eggs on vegetation. The floating mop is used for species that spawn at or near the water surface or high in the water column. Also called top mop.

floating net cage = a net on a frame supported by floats and used in sheltered bays for fish farming.

floating processor = a large ship processing fish at sea.

floating trap = a pound net supported by logs and heavily anchored.

floating trawl = a trawl designed to be worked off the bottom. Also called midwater trawl, pelagic trawl. See also Larsen midwater trawl.

floating worm = a plastic worm that floats on the water and is used in fishing for spawning bass (*Micropterus*).

floatline = a horizontal mainline, less than one nautical mile long, suspended from floats, from which leaders with baited hooks depend. Used for yellowfin and bigeye tunas and other pelagic species.

floe = a large flattish piece of sea or lake ice more than 20 metres across.

flog(ging) = to work on a merchant's premises handling, packing, and moving dried cod as a daily occupation in Newfoundland.

flood = 1) a flow above the carrying capacity of a channel.

flood = 2) a period when the tidal level is rising.

flood = 3) the flood current during the period when the tidal level is rising.

flood current = the movement of a tidal current toward the shore or up a tidal stream.

flood fishery = the fishery made when water levels fall after a flood season. This natural event may be aided by digging pits, diversion channels, dams, etc. See also tidal fishery.

flood interval = the interval between the transit of the moon over the meridian of a place and the time of the following flood.

flood plain = floodplain.

flood stel = a fishery involving a stel carried out on a flood tide.

flood tidal delta = the bulge of sand formed at the landward mouth of tidal inlets as a result of flow expansion.

flood tide = rising or incoming tide; the period between low water and the succeeding high water. Flow enters an estuary during a flood tide. Also called rising tide.

flood way = the channel of a river and the adjacent flood plain that is reasonably required to carry and discharge flood water.

floodplain = low lying areas next to a river that are inundated seasonally from the river. May be used by fish for spawning. A living flood plain has regular floods while a fossil floodplain is beyond the reach of the highest flood.

floodway = flood way.

floor = the horizontal surface of a flake.

flopper stopper = a paravane stabiliser or roll-damping device on small to medium-sized trawlers of the Northwest Atlantic, rigged on booms extending out from both sides of the trawler and towed by cables or chains a few metres below the sea surface. Also called bird.

Florida fish-poison tree = *Piscidia piscipula* (Fabaceae, pea family), also called Jamaican dogwood and fishfuddle tree. Seminoles in Florida used a powder made from its roots, bark, and leaves to stun fish. See also fish poison tree.

Florida rig = a method of securing a hook to a soft bait so it does not become entangled in weeds. It resembles a Texas rig but the weight is secured by screwing into the bait. A slip sinker is threaded onto the line and a hook tied to the line end. The hook is inserted into the head of a worm, for example, and brought through until only the eye is in the worm. The hook is then rotated and the point embedded slightly into the worm without coming out on the opposite side.

*floruit* = 1) flourished, referring to the period of greatest success and diversity of a taxon. Usually seen as the abbreviation fl. or *fl.*

*floruit* = 2) flourished, used before the date of an author to indicate when he was actively working, especially when birth and death dates are unknown. Also used for an author of a name. Usually seen as the abbreviation fl. or *fl.*

floss = material for tying flies in fly fishing.

Floss or  $F_{loss}$  = fishing mortality corresponding to an expected lifetime contribution to the spawning stock biomass for the average recruit to the fishery (SSB/R) equal to the inverse of R/SSB at the lowest observed spawning stock (LOSS).

flossing = use of long leaders to float a hook through closely grouped fish, trying to snag them on the outside of the jaw.

flote = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

flotilla = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for swordfish.

flotsam = floating matter.

flounder = 1) a drowned corpse (slang).

flounder = 2) to have difficulty.

flounder = 3) any of various marine flatfishes of the families Bothidae and Pleuronectidae. Flounder is a general term for flatfishes and is apparently of Scandinavian origin.

flounder-and-dab = a cab (rhyming slang).

flounder-man = a hawker of flounders.

flounder-mouth = having a mouth like a flounder, a large mouth.

flounder-up = to choke a watercourse.

flour = a flour made of pulverised, dried fish parts.

floury = the surface condition of well-preserved, high quality salt cod; the salt came to the surface imparting an appearance of fine flour.

Flow or  $F_{low}$  = fishing mortality ( $F$ ) corresponding to a SSB/R equal to the inverse of the 10% percentile of the observed R/SSB. This level of  $F$  has recruitment which balances mortality in about 9 out of 10 years so a decline in the stock at this level of exploitation is unlikely.

flow = 1) the movement of flowing water from place to place.

flow = 2) the moving water itself.

flow = 3) the volume of water going past a specific point over a specified time period.

flow = 4) a fleet of fishing boats gathered in one place (Shetland Isles dialect).

flow = 5) a net has flow when it hangs loosely and is not too taught (Scottish dialect).

flow rate = velocity of flow multiplied by cross-sectional area of the river.

flow regime = the characteristics over time of stream or river discharge.

flowerhorn craze = a Central/South American cichlid (a *Amphilophus* hybrid, possibly hybridised with other cichlids such as *Cichlasoma* spp.), known as luo han in Singapore, that was the subject of a craze in 2003. It supposedly brought good luck and prosperity and many were sold by opportunistic aquarium dealers. Discarded in local waterways in Malaysia for example, it survives in the wild as a potentially dangerous exotic.

flowing water = any water body showing continuous unidirectional flow; water running from higher to lower elevations as in a river. Also called running water.

flows = artificially increased flows in a river system instituted to move young fish quickly downstream during their spring migration period.

flow-through system = an aquaculture system where the water supply flows through and is not re-used. The water may be treated after use before discharge into the environment.

fluctuating asymmetry = absence of tendency of one side of the body to have a greater meristic count.

fluff = small pickle-cured cod, or trimmings obtained in boneless cod preparations, reduced to small fibres in a shredding machine and dried.

fluid collection = museum specimens or parts thereof stored in ethanol, isopropanol, formalin or other preservatives. Also called wet collection.

fluid ounce= 29.573 millilitres (28.413 millilitres in the Imperial system). Abbreviated as fl oz.

fluid preservative = the liquid used as a storage medium for fish specimens, e.g. ethanol, isopropanol, formalin. Also called wet preservative.

fluidising bed = a biological filtration system used in aquaria comprising of small beads in a cylinder. Bacteria grow on the beads and denitrify the water as it is forced through the cylinder.

fluke = monogenetic trematode parasites common on fishes, of various taxa (such as *Gyrodactylus* spp., *Dactylogyrus* spp.). These flukes anchor in the skin, fins and gills often causing excessive mucus secretion. Fish exhibit flashing, scratching, fraying of fins, clamped fins, flaring of opercula, and severe gill infections resulting in death. Digenetic eye flukes (*Diplostomum spathicum*) cause white spots in the eye and eventually blindness. Black-spot disease (q.v.) is also caused by a fluke.

fluke bag = a bag for holding a catch of flounders.

fluke bar = an iron rod with hooks dragged along the sea floor to impale fish such as flatfishes. Also called murderer.

fluke fou = a spear for catching flounders in sand (Scottish dialect).

fluke-mouthed - having a mouth like a fluke or flatfish (Scottish dialect).

fluke-treading = a method of catching flounders by treading on wet sand and causing them to rise.

flume = an artificial structure leading water from a diversion dam or weir. May be used to direct water into an electrical generating facility or, in a log flume, used to transport logs. Not usually a habitat for fishes.

flunk = an anchor fixing a trawl line in place.

flunk buoy = float (1).

flunk keg = float (1).

flush = treating fishes in aquaculture for diseases or parasites by a short bath in a chemical at high concentration. The chemical is added to the flowing water and passes over the fish as a pulse.

flushing = the downstream movement of fish caused by water velocity.

flushing rate = the rate at which an amount of water passes from an estuary, harbour, lake or aquaculture tank through its outlet. Often used to indicate how often the water in a system is replaced by fresh water. Important in terms of nutrient inputs and retention.

fluted blade = in angling, a spinner or spoon with indentations aimed at reflecting more light.

flutter = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

fluvial = pertaining to rivers, flowing; pertaining to fish that live in or migrate between main rivers and tributaries.

fluvial anadromous = not requiring lakes in the life cycle, *cf.* lacustrine anadromous.

fluviatile = pertaining to streams and rivers; inhabiting streams or rivers as with fishes.

fluvifaunula (plural fluvifaunulae) = the consociation of animals found in a river or series of rivers (from Latin *fluvius*, a river, plus diminutive of *fauna*).

fluvifaunulae = plural of fluvifaunula.

fluviomarine = inhabiting rivers and the sea.

fly = 1) an insect or artificial rendering of one used as a bait in fly fishing; made of hair, feathers and thread tied to a hook, intricately and beautifully made. Numerous types and individual variants tied by anglers, a selection of them is mentioned in this dictionary but fly sites on the internet give much more detail, methods of tying them and the fishes they catch under specified conditions. Wet flies represent nymphs swimming to the surface to become adults, dry flies represent adult insects after emerging from the nymph and streamers are flies that represent minnows, crayfish, leeches and other aquatic life. A wide variety of hook types exist on which to tie the fly. Wet fly hooks are heavier than dry fly hooks. Each fly consists basically of a body (wrapped around the hook shank) and a wing that sticks out above the shank. Various additions to this basic plan can be used to simulate a fish, for example, in a streamer fly. The tail extends a short distance beyond the bend of the hook and curves upwards. The tip is made of silk for appearance and helps hold up the tail. Ribbing can be added to the body for brightness and flash. The throat is a bunch of fibres underneath or as a collar just behind the head, itself behind the eye of the hook. The throat provides action to the fly. The cheek behind the head simulates an eye. The shoulder behind the cheek imitates a fish's head. The underbody below the shank is made usually of hair and provides lighter colouring like a fish's belly. The tag is of tinsel or metal thread on the bend of the hook as added flash. Topping above the wing is supposed to resemble a fish's back. The butt is at the base of the tail and is for appearance but may be designed in some flies to imitate an egg sac. Horns above the wing are meant to imitate the feelers or antennae of an insect.

fly = 2) an item of dress often found open in drowned male anglers fishing from a small, unstable boat.

fly = 3) an inshore water area usually poor in fish (Newfoundland).

fly book = a book-like case for holding artificial flies.

fly casting = the art and skill of projecting an artificial fly on a line to the spot where the fish lie.

fly dope = a dressing that makes an artificial fly float.

fly dragging = fishing with a fly seine, a lightweight demersal seine, that is towed and heaved at the same time. Also called fly seining.

fly dressing = fly tying.

fly fish = fly fishing.

fly fishing = sport fishing using an artificial or imitation fly with a rod and reel where a heavy line is used to cast the very light-weight fly.

fly hook = a hook baited with a fly.

fly leader = a leader (*q.v.*) used in fly fishing.

fly line = 1) a line for fly fishing. Originally made of silk but now a braided core covered with a plastic coating and about 1.5-2.0 mm in diameter. The plastic coating gives weight to the line which is necessary to deliver the fly as no weights are used. Fly lines are rated by weight, referring to the first ca. 10 metres of line, from 1 to 11. Weight forward fly lines are heavier near the fly. Length of fly lines is short, usually less than 32 metres.

fly line = 2) a hook tied directly to a line, without a weight.

fly net = a form of stake net, *q.v.*, with up to a dozen stakes used to support the trap and up to 35 stakes to support the leader. May be set singly or in several set in line, usually on beaches with a fairly gentle gradient, *cf.* jumper net.

fly pattern = a recipe or particular method and arrangement for tying a specific artificial fly.

fly reel = a fishing reel designed to hold a fly line, fairly light, simply constructed (as fly line is pulled off and cast by hand, is relatively short and has no weights for distance casting), attached near the end of the fly rod, and may have a drag system to create resistance to a fish pulling line rapidly. Single action reels have one turn of the handle equivalent to one turn of the spool (1-to-1), multipliers use gears to have a 2-to-1 ratio and automatic reels operate by a manually wound spring activated by a lever but are heavy and tend to malfunction.

fly rod = fishing rod for casting a fly line. Longer and thinner than spinning rods, with more line guides and designed carefully for bending as the action determines how the line is cast. Originally split bamboo but now various plastic materials and graphites are used. Fly rods are

rated by stiffness and match fly lines of different weights. The fly reel is attached near the butt and so the hand holds the rod above the reel.

fly seining = fly dragging.

fly tying = the technique of making imitation insects or flies as bait for fish. See fly. Also called fly dressing.

fly'n rind = a leadhead jig with a pork rind trailer. Also called jig 'n pig.

flying = fishing on the fly.

flying fish = code name for Tunis and Tunisia in World War II.

flying fish cocktail = a mix of gin, orange curacao, maraschino liqueur and peach bitters.

flying food = insects and other arthropods caught by fishes by leaping from the water or caught at the air-water interface.

flying gaff = a gaff with a detachable hook end which is tied to a rope attached to the boat. Allows easier control of large fish from a small boat.

flying set = fishing on the fly.

flyingfish = a family of marine fishes, Exocoetidae, with about 52 species in tropical to warm-temperate oceans. They do not fly but glide for long distances out of the water using greatly expanded pectoral, pelvic and caudal fins, the expansion varying between species (fish with enlarged pectoral fins are called monoplane or two-winged, those with enlarged pelvics also are called biplane or four-winged; the former are more erratic fliers). The flight occurs after a build up of speed under water, aided by the enlarged lower lobe of the caudal fin, when the fish breaks out of the water or a wave front, sometimes gliding high enough to land on ships. Free flights last 13 seconds or more and touch-and-go flights 42 seconds or more. Air speeds reach 55 km/h and cover up to 200 m.

F<sub>max</sub> or F<sub>med</sub> = the rate of fishing mortality for a given exploitation pattern, rate of growth, and natural mortality that results in the maximum yield per recruit; the point that defines growth overfishing. This mortality would give the maximum catch year after year. F<sub>0.1</sub> is often preferred as F<sub>max</sub> is difficult to estimate.

F<sub>med</sub> or F<sub>med</sub> = the fishing mortality rate corresponding to an equilibrium spawning potential ratio (SPR) equal to the inverse of the median observed survival ratio (ratio of recruits to parental spawning biomass). The level of F where recruitment in half of the years has been sufficient to balance the mortality. Such a stock exploited at F<sub>med</sub> should be able to replace itself close to historical abundance.

FMP = Fishery Management Plan (a plan to achieve specified management goals for a fishery. It includes data, analyses, and management measures for a fishery).

FMSY or  $F_{MSY}$  = the fishing mortality rate which, if applied constantly, would result in maximum sustainable yield. Can be estimated from simple biomass-aggregated production models or from age-structured models that include a stock-recruitment relationship. Reality applies, however, and as the ocean conditions change a constant fishing mortality of  $F_{MSY}$  would give varying catches and eventually overfishing would result. A  $2/3F_{MSY}$  is used to avoid overfishing. Fishing at this level means fishermen use only two-thirds of the effort needed to achieve maximum sustainable yield but they catch 80-90% of the MSY. Their catch rate is higher.

fo. = abbreviation for folio.

FO = fish only.

foam fractionator = an aquarium chemical filtration system which removes dissolved organic compounds and microscopic particles. Many small bubbles are sent through a column of water to separate dissolved organic compounds from the water. They come in three varieties, venturi, counter-current, and co-current and are only effective in salt water. They may be placed in the tank, hung on the side, or placed in a sump. Also called a protein skimmer.

foamer = in angling, fish breaking the water surface while feeding on bait fish.

foazy = fozie.

focal point = the location of an organism; in fish usually taken as the position of the snout when maintaining a station. The position should be maintained for at least 10 seconds.

foci = plural of focus.

focus (plural foci) = the first part of a scale to appear in growth, area within the smallest circulus.

fodder = a feed in aquaculture with a relatively low nutritional value.

fodder fish = fish used to feed other organisms on account of their availability and low cost, e.g. herring fed to salmon, by-catch used as animal feed.

foggara = a term for a qanat in North Africa (an underground water channel constructed in alluvial fan material to tap the water table and provide a constant flow of water. Mostly found in the Middle East and a habitat there for fishes. Called karez in central Asia and falaj in Arabia).

folding bone = a thin strip of fish bone used to fold and press leather edges under in bookbinding.

folia branchialis = gill filament (the thread-like, soft, red respiratory and excretory structure projecting outward from the gill arch).

foliaceous = leaf-like.

foliate = flat, leaf-like and lobed or subdivided.

foliform = leaf-like.

folio = a leaf of a book or manuscript. It may also indicate separate parts of a work. Abbreviated as fo.

foliose = leaf-like.

folk taxonomy = local names for fishes, hierarchically arranged.

Folkestone beef = dried dogfish (Kent dialect).

follicle cell = a companion or Sertoli cell enveloping the cysts of spermatogenic cells in the testis.

follower = a fish or other organism that follows the nuclear predator (*q.v.*) to snap up escaping prey or organisms disturbed by the nuclear predator.

Fomalhaut = the eighteenth brightest star in the sky, located at the mouth of the Southern Fish, Piscis Austrinus or Piscis Australes (both *q.v.*), in the southern autumn sky. Fomlhaut is derived from the Arabic for fish's mouth. Appears in the legends of various cultures, e.g. in the Persian Empire of 3000 B.C. was one of the four royal stars watching over other stars, in Syria and Canaan it was the symbol of the fish god Dagon (*q.v.*).

fomes = brushes, dip nets and other items used in aquaculture contaminated with infectious organisms. The plural form fomites is usually used.

fomites = plural of fomes.

fontanel = a gap between bones in the skull, closed by a membrane, where ossification of cartilage or connective tissue did not occur. Commonly found on top of the skull between the frontal bones (anterior fontanel) and between the parietal bones (posterior fontanel), e.g. in certain Catostomidae.

fontanella (plural fontanellæ) = fontanel.

fontanellæ = plural of fontanella.

fontanelle = fontanel.

fontaneous = pertaining to a freshwater spring.

food conversion efficiency = the amount of food required to produce a certain amount of wet weight in an aquaculture species. Wet foods have a higher value than dry foods because of the difference in moisture content, a lower value being more efficient. Also expressed as a ratio, see below.

food conversion factor = consumption of a certain feed (kg)/gross increment of fish given this feed (kg).

food conversion ratio = food consumed (net weight)/fish body weight (net gain) or food applied/total weight at harvest- total weight at stocking.

food efficiency = total production of fish\*100/total consumption of feed (kg).

food fall = the descent of a large dead organism (such as a whale) and the corpse itself, to and on the sea floor It then forms a nutrient supply for a variety of organisms and for fish both directly and indirectly. Also used for the much smaller marine snow or plankton rain.

food fish = fish intended for direct human consumption; eatable.

food mixture = in aquaculture, a feed composed of the basic nutrients in the correct quantities according to dietary formula.

food net = feeding interrelationships in a community.

food relations = interrelationships in the circulation of food in a community of fishes.

food requirement = annual mean amount required by the biomass of species to produce mean growth.

food shelf = an angling term for an area in a lake or river where there is rich plant growth and fish growth is supported.

food utilisation rate = protein increase in fish body\*100/protein in consumed food.

foot = 1) 0.305 m, 12 inches. Abbreviated as ft.

foot = 2) the bottom or lower part of a fish net, often weighted to sink in the water.

foot fishing = fishing by foot.

foot line = footrope.

foot of water pressure =  $304.79 \text{ kg/m}^2$ ,  $0.434 \text{ in/in.}^2$ .

foot rope = footrope.

football head = a jig resembling an American football mounted sideways; used in rocky locations.

footrope = the weighted rope at the lower edge of a gill, drift, tangle, trawl or trammel net. See also ground rope and foot line.

foots = 1) the leftover liquid after oil has been removed from boiled cod livers. May be concentrated as cod liver meal and as animal feed.

foots = 2) the bottom of a net where lead weights are attached to keep the net in place.

$f_{opt}$  or  $f_{opt}$  = the effective fishing effort corresponding to FMSY (q.v.). Also called fMSY.

forage (noun) = 1) the diet of a fish species.

forage (verb) = 2) to search for food.

forage fish = fish which serve as food for other fish especially for commercial or sport fishes. They may be deliberately stocked in ponds or lakes.

foramen (plural foramina) = a small opening, orifice, or perforation. Used when something, e.g. nerve, blood vessel, notochord, passes through the opening.

foramen beryciform = an opening in the ceratohyal of uncertain function in Beryciformes, sometimes reduced to a notch on the dorsal margin.

foramen magnum = the aperture in the posterior part of the skull for the passage of the spinal cord. It is bordered by the supraoccipital dorsally, the exoccipitals laterally and the basioccipital ventrally.

foramina = plural of foramen.

force of fishing mortality = the extent to which a stock is susceptible to fishing; quantitatively, the proportion of the stock removed by a defined unit of fishing effort. In pelagic fishes, an inverse function of stock biomass. When it is 0.01 or less it can be used as an instantaneous rate in measuring population change. Also called catchability, catchability coefficient.

force of natural mortality = instantaneous rate of natural mortality (when natural and fishing mortality operate concurrently it is equal to the instantaneous total mortality rate, multiplied by the ratio of natural deaths to all deaths (Ricker, 1975). Abbreviated as M).

forced migration = a migration caused by events other than normal, e.g. rising or falling temperatures, storms.

forced swimming = fast swimming of fish to an anode in electro-fishing.

forcing factor = a factor that conditions the behaviour of the fishery resource, e.g. temperature, salinity, upwelling, etc.

fore reef = the portion of a reef seaward of the reef crest. Also called reef slope.

fore reef escarpment = a slope or cliff seaward of the fore reef terrace, at a depth of about 25-30 m.

fore reef slope = a sand covered, gradual or sharply descending slope; the next-to-deepest part of the fore reef.

fore reef terrace = the uppermost portion of the fore reef; a flat plain beginning at the base of the buttress or mixed zone, at a depth of about 60 m.

fore-balk = to set a salmon net in below or front of another's.

fore-heck = the grating in front of a salmon weir. See also heck.

forebait = limpets crushed in the mouth and spat out onto the water surface to attract fish towards baited hooks (Scottish dialect).

forebay = 1) the part of a dam's reservoir that is immediately upstream from the powerhouse.

forebay = 2) heart (the heart-shaped part of a trap with two wings deflecting the fish into a chamber).

forebay guidance net = a large net placed in the forebay of a dam to guide juvenile fish away from the powerhouse.

forebrain = anterior region of the developing brain including the telencephalon and diencephalon in larval fish that includes the olfactory lobes.

foregut = anterior part of the larval gut from which the stomach and oesophagus develop.

forehead = the frontal curve of the head.

foreign fishing = fishing by a foreign vessel.

foreigner = a vessel carrying dried cod to overseas markets (Newfoundland).

Forel scale = a scale of yellows, greens and blues for determining the colour of sea or lake water as seen against the white background of a Secchi disc at a set depth. Deep blue = 00, blue = 10, greenish blue = 20, blueish green = 30, green = 40, etc according to a set of standard colours. Named after François-Alphonse Forel.

Forel-Ule scale = a modified version of the Forel scale.

foreshore = the beach between mean higher high water and mean lower low water.

foreshortened preceding ray = in some acanthopterygians, a condition where the base of the ventral procurrent ray immediately anterior to the posteriormost ventral procurrent ray is shortened and overlaps less with the haemal spine or other supporting bones than do its neighbours.

forcate = deeply forked; scissors-like.

forged hook = a hook made of forged metal for extra strength when used for large fish.

forgotten name = *nomen oblitum* (a forgotten name, an unused senior synonym rejected under the provisions of the International Code of Zoological Nomenclature. Formerly a senior synonym not once applied to a particular taxon as its presumably valid name for the immediately preceding 50 years (other than in a synonymy, listing in an abstracting publication or a nomenclator) and to which taxon has been currently been applied a junior synonym by at

least 5 different authors in at least 10 publications during the immediately preceding 50 years. Such a name, unless otherwise ruled, is to be rejected for the purposes of the Law of Priority but not for those of the Law of Homonymy. No longer recognised. After 1 January 2000 applied to a name, unused since 1899, which as a result of an action taken under the Code does not take precedence over a younger synonym or homonym in prevailing usage; the younger name which takes precedence over the *nomen oblitum* may be called a *nomen protectum*. A *nomen oblitum* remains an available name. Abbreviated as *nom. oblit.*).

forehead brooding = carrying of an egg mass on a supraoccipital hook by *Kurtus gulliveri* (Kurtidae).

foricula = plural of foriculum.

foriculum (plural foricula) = the specialized scale in female *Anableps* covering the genital opening but free on one side so as to allow the entrance of the male intromittent organ. The free side may be right or left permitting copulation only with a left- or right-handed male intromittent organ respectively

fork = to transfer fish from a boat to a vessel or fishing stage using a fork or tined instrument.

fork length = the distance from the most anterior point of the body (usually the snout even when the lower jaw projects) to the deepest point of the fork in the caudal fin. Abbreviated FL. Mostly used in fishery biology and not in systematics.

fork tidbit = gaffel bitar (semi-preserved fat herring, gilled or headless, with 10-12% salt and sometimes benzoic acid added. The product is ripened in barrels at moderate temperature, then filleted, skinned and cut into 'tidbit' pieces, packed with spiced brine, and also with vinegar or with sauces in cans or glass jars. Also called tidbits or herring tidbits).

forked = diverging, said of the caudal fin when the upper and lower lobes diverge.

forken = furkin.

forkon = furkin.

form = 1) a neutral term for a single individual, phenon, or taxon; a group, e.g. larvae and adult forms, male and female forms, ecological forms, and seasonal forms.

form = 2) an infrasubspecific group.

form = 3) in the past, a subspecies (not recommended usage). According to the International Code of Zoological Nomenclature the use of the term "form" before 1961 is not to be interpreted as an express statement of either subspecific or infrasubspecific rank and after 1960 it is to be regarded as of infrasubspecific rank.

-form (suffix) = in the shape of.

*forma* = form.

forma alicuius loci = an obsolete and unofficial term in taxonomy for an individual variety, which in the case of polymorphism is restricted to a portion of the range of the respective variety or species.

formalin = formaldehyde gas dissolved in water used as a fixative and preservative in fish collections as decay bacteria cannot live in a 5-10% solution of it. Formalin is a 37-40% solution of formaldehyde in water, making 100% formalin. It may contain some methanol. Usually replaced with ethanol for long term storage. Also used in the control of external parasites and fungal infections of fish and eggs in aquaculture. Formalin is a noxious chemical and should be handled with appropriate safety measures.

formed fillet = a portion cut from a block in such a way that it appears to be a natural fillet, although all such fillets are exactly the same size and shape.

Formenkreis = a group of related allopatric species or subspecies.

formulae, zoological = modifications of available names throughout a taxonomic group by the addition of a standard prefix or suffix in order to indicate that the taxa named are members of that group. Zoological formulae are excluded from the provisions of the International Code of Zoological Nomenclature. The suffixes of family-group names denote ranks, not taxonomic groups, and do not form zoological formulae.

formulated diet = food prepared specially for fish in aquaculture or aquaria. Carbohydrates, fats and proteins will be present in a specified mix along with vitamins and a binder so that the mix holds together in water.

formulated feed = formulated diet.

formulation = the etymology of a name in taxonomy, how it is formed.

forra fish = a salmon that has left the sea early in the season (Scottish dialect).

fortification = in aquaculture, the addition of nutrients to regular feed, e.g. vitamins, minerals.

forward taper = weight-forward (a type of fly line with most of its weight in the first 10 metres of line. The large section of this line is called the line belly, with a long tapering section towards the front and a short tapering towards the back where it becomes a thinner running line).

fosey = fozie.

fosy = fozie.

fossa (plural fossæ) = groove, pit or depressed area in a bone into which another bone fits.

fossa glenoidea = a fossa in the glenoid region of the pectoral girdle.

fossæ = plural of fossa.

fosse = fossa.

fossette = a small pit or depression.

fossey = fozie.

fossorial = burrowing.

Foster-Lucas pond = a pond inbetween a circular pond and a raceway with rounded ends and elongate sides (5 x 23 x 1 metre).

foul bottom = foul ground.

foul fish = 1) a foul-hooked fish.

foul fish = 2) a fisherman's taboo word for the Atlantic salmon.

foul ground = a sea bed that will snag nets. Also called foully.

foul hooked = a fish caught by hook other than in the mouth. Usually illegal although some species are legally caught using hooks dragged through the water.

fouly = foul ground.

founder population = fish broodstock used to start a fish culture programme.

founding population = the reproductively active individuals that originally made up a new population

founding stock = the reproductively active individuals that originally made up a new stock, e.g., in aquaculture.

fountain = a natural or artificial water spring.

four boat lift net = a Japanese coastal net about 50 m square set on or near the bottom with the boats anchored and attached by a rope to each net corner. A fifth, smaller, boat scatters bait over the centre of the net and the net is hauled when sufficient fish are attracted. May be used at night with lights as the attractant. See also two boat, three boat and eight boat lift nets.

four seam trawl = a trawl made up of four panels, top, bottom and two sides.

fovea (plural foveae) = 1) a shallow depression of small diameter, a pit.

fovea (plural foveae) =2) a sensory region of high acuity, e.g. the Schnauzenorgan (*q.v.*) of Mormyridae.

foveae = plural of fovea.

fozey = fozie.

fozie = soft or spongy, said of diseased salmon in Scotland. Also spelled fozy, fozzy, foazy, fozey, fosie, fosy, fosey, fossey and fozzie.

fozy = fozie.

fozzie = fozie.

fozzy = fozie.

$F_{pa}$  = the precautionary fishing mortality, a lower level than  $F_{lim}$  (*q.v.*) to allow for uncertainties in assessment. See also precautionary approach,  $B_{lim}$ ,  $B_{pa}$  and  $F_{lim}$ .

FPC = fish protein concentrate.

fractional spawning = release of eggs at intervals, usually over several days or weeks. This allows more, smaller and immature eggs to be carried in a limited abdominal cavity space as the intervals enable the smaller eggs time to mature; and once shed, eggs mature at different times and thus may avoid complete loss of a season's spawning to predators. Also called batch spawner.

fraenum = frenum.

fragmotype = a joke name in taxonomy for a type specimen represented by a body part only.

frame = the remains of a filleted cod (Newfoundland). See also fish fly.

frame survey = the inventory of ports, landing places, number and type of fishing units (boats and gears), and a description of fishing and landing activity patterns, fish distribution routes, processing and marketing patterns, supply centres for goods and services, etc., a complete description of the system.

frame swimfeeder = in angling, a plastic frame around which groundbait (*q.v.*) is moulded.

frame trawl = a conical shaped trawl with the mouth kept open by a rigid frame.

frankenfish = 1) genetically modified fish, escapees from aquaculture facilities, introduced predators and, by extension, any fish deemed harmful in some way through human action. Derived from the novel Frankenstein by Mary Wollstonecraft Shelley, in which Dr. Frankenstein created a monster.

frankenfish = 2) to destroy through high voltage and, by extension, to frazzle or wear out (slang).

F-ratio = the ratio of fishing mortality on the oldest age group to the fishing mortality of the preceding age group. Annual F-ratios are estimable parameters in many tuned virtual population analysis assessments.

fray = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

frazil = a form of fine spicular ice. When first formed the particles are colloidal and not visible in the water in which they float. Called lolly ice in salt water.

free = unconnected; said, for example, of fin rays or spines not connected to each other by a membrane, or having a moveable rear corner to a fin, not attached to the body.

free fishery = 1) a royal franchise or exclusive privilege of fishing in a public river. Compare common fishery and several fishery.

free fishery = 2) slang for the pudendum.

free fishing = legal fishing without a licence or payment. See freefishery.

free lining = angling without a float or weight. Used with large baits at close range in clear water or with light baits like flies that are kept afloat by the current.

free neuromast = sense organs found in the epidermis. See also canal neuromasts and small pit organs. Also called superficial neuromasts and large pit organs.

free-diving = diving without the assistance of any breathing apparatus, e.g. using a snorkel, a mask, a pair of flippers, a weight belt and a wet suit. Used to collect fishery resources in shallow waters or for spear fishing.

free-spooling = allowing a bait-casting reel to spin freely so that the line runs off when casting.

free-swimming = moving freely in the water. Applied to fish that hatch in gravel and develop there initially.

freedom of fishing = part of the international law of the sea, dating back to the 17th century, which states that high seas resources should be free to all.

freefishery = a royal franchise or exclusive privilege of fishing in a public river.

freestone river = a larger body than a freestone stream.

freestone stream = a stream characterised by a bottom of gravel, cobbles, rocks and boulders. Most water in it is from rainfall or ice and snow melt.

freeze drying = dehydration in a vacuum from a frozen condition.

freezer burn = drying out of frozen fish by sublimation in areas not protected against water vapour loss. The colour, appearance and texture change and marketability is affected. Dull white patches are characteristic.

freezer trawler = a trawler with refrigerating and fish freezing equipment and insulated fish holds.

freezer weight loss = dehydration of fish when being frozen.

freighter = a member of a fishing-crew transported by vessel to his fishing station. Used in Newfoundland for stations in Labrador.

French blade = in angling, a type of spoon or spinner blade with a raised dome, highly polished with a strong reflective quality and a tendency not to lift the rig.

French cut = Aberdeen cut (a cut of fish from a frozen block, rhombus-shaped with the sides often squared off or cut with a tapered edge. Usually breaded and battered. Also called diamond cut).

French fry = 1) a potato accompaniment to fried fish.

French fry = 2) a soft plastic worm resembling a crinkle-cut French fry often used on Carolina rigs, *q.v.*

French shore = the coast of Newfoundland where the French had fishing and curing rights, varying with time (*cf.* English shore). Used to run from Cape St. John to Cape Ray up until 1904 when access was denied.

frenum = the tissue joining the lip to the symphysis of the lower (e.g. Embiotocidae) or upper jaw (e.g. some Cyprinidae, *Rhinichthys cataractae*). Rarely the frenum is hidden in the fold between the lip and the snout. The frenum renders the jaw nonprotractile, that is, incapable of being projected out.

fresh = 1) fresh fish.

fresh = 2) a fisherman in his first or second season at the West Country-Newfoundland fishery.

fresh cork = to renew the cork floats on a net (Newfoundland).

fresh fish = 1) fish with little or no spoilage, preserved by chilling but never frozen or heated and without additives.

fresh fish = 2) thawed fish packaged for sale as fresh fish.

fresh fish = 3) a raw recruit, as in the British Army of the Napoleonic Wars.

fresh fish sold here daily = example of a redundant sign in a fish shop. None of the words are needed as the fish are readily visible (and can be smelled some distance away), they are in a shop to be sold not given away, they could not be sold if they were not fresh, they are not being sold anywhere else but here, and to be fresh they must be sold daily.

fresh fishing = commercial fishing where the catch is put on ice rather than salt, *cf.* salt fishing. Fish were placed in meter high pens so the weight was kept off the bottom layers and the catch was not damaged; pickle was not expressed as in salt fishing.

fresh frozen = a descriptive term for the end product of fish processing. The fish are gutted, cleaned, flash frozen and packed whole.

fresh water = water having a salinity of less than 0.5 parts per thousand (or 2 parts per thousand, sources differ). Freshwater is the adjective - fish in fresh water are freshwater fish. Also means water free from impurities.

freshet = 1) stream.

freshet = 2) a great rise or overflowing of a stream caused by heavy rains or melted snow.

freshet = 3) an area of fresh water at or near the mouth of a stream entering the sea.

freshwater = an adjective, see fresh water.

freshwater eel disease = bacterial haemorrhagic septicaemia (a bacterial infection with *Aeromonas liquefaciens*, *Aeromonas hydrophila* or *Pseudomonas* affecting fishes of all ages, usually in spring. Usually associated with stress and overcrowding. Haemorrhages occur in the skin, fins, mouth cavity and muscles. Exophthalmia and cavity ulcers may occur. Also called infectious dropsy, red pest, redmouth disease and motile aeromonad septicaemia. See also pike pest).

freshwater shark = northern pike (*Esox lucius*), from its voracity.

fried fish = fish pieces covered in batter or breaded and fried in oil or fat.

fried marinade = frying or baking fish before packing in an acetic acid and salt solution.

fries = plural of fry.

fright reaction = wriggling, darting and other movements stimulated in members of the Cypriniformes and Gonorynchiformes on scenting the alarm substance released from the injured skin of their own or a related species. These movements serve to warn of or confuse a predator.

frightening line = a line or chain with suspended leaves or fibres pulled by two or more men in order to frighten fish towards a trap. Also called scaring line.

fringed lappet = oral fimbria (one of a series of small tag-like appendages around the perimeter of the oral disc of lampreys (Petromyzontiformes), presumed to help create an effective seal when the lamprey is attached to its host and also probably sensory. Also called fringed processes, leaf-like processes, epithelial fringe, leathery appendices and leathery appendages).

fringed process = oral fimbria (one of a series of small tag-like appendages around the perimeter of the oral disc of lampreys (Petromyzontiformes), presumed to help create an effective seal when the lamprey is attached to its host and also probably sensory. Also called leaf-like processes, epithelial fringe, leathery appendices and leathery appendages).

fringing reef = a coral reef formed as a narrow band close to shore. Also called shore reef.

fritter = fish coated in batter and deep-fried.

frog = a tough but soft plastic lure used by anglers in scummy areas.

frog water = an angling term for slow moving water, as in a backwater.

front = a region of sharp gradient in temperature, salinity and density, indicating a transition between two current systems or water masses. Fronts are areas of high biological activity.

front runner = the leading member of a school of fish, usually smaller than other fish in the school.

front trolling = a system of boat control when a bait or lure is trolled behind a moving boat.

frontal = the superficial, paired dermal bone on top of the skull above the eyes, paired or fused into one. The frontals of fishes correspond to the parietals of Tetrapoda but frontal is retained on account of its long usage in fish osteology. These large bones cover much of the neurocranium and may fuse with the lateral ethmoids and articulate with some of the circumorbital bones, the spehenotic and the pterotic. In the parietolateral skull type, the parietals are separated allowing the frontals to meet the supraoccipital.

frontal clasper = cephalic clasper (a mace-like spiny-headed rod found on the mid-dorsal surface of heads of male Holocephali. Thought to aid in holding the female during copulation).

frontal gibbosity = a fleshy lump on the top of the head, e.g. in adult male cichlids. Also called nuchal hump.

frontal groove = a groove between the nasal and other anterior skull bones allowing the upper jaw to slide into it when the mouth is closed.

frontal ridge = one of a series of ridges on the frontal bone between the eyes.

frontal scale pattern = the arrangement of frontal scales in Cyprindontidae, Goodeidae and Poeciliidae may be indicated by letters of the alphabet (Scheel, 1990).

frontal threat display = when a fish faces another fish and flares its gills and opens its mouth wide. May indicate aggression, defense of territory or self-defense by making it appear too large to attack or eat.

frontispiece = an illustration in a book on the page facing the title page.

frontoparietal = the region above and behind the eyes on the head (named for the underlying bones).

froth nest = bubble nest (nests composed of bubbles and secretions built by Anabantidae and some characins. Serves as a protective coating for the eggs and newly hatched young).

frozen at sea = fish frozen very soon after capture on a factory ship or a freezer trawler.

frozen fish = fish rapidly frozen to -18°C or below to preserve them.

FRT = fast repetitive click.

frugivore = a feeder on fruit.

frugivorous = fruit eating, e.g. certain Characidae such as *Brycon* spp.

fry = 1) a young fish at the post-larval stage. May include all fish stages from hatching to fingerling. An advanced fry is any young fish from the start of exogenous feeding after the yolk is absorbed while a sac fry is from hatching to yolk sac absorption. In Salmonidae, the stage from end of dependence on the yolk sac as the primary source of nutrition to dispersal from the redd.

fry = 2) a tasty vegetable accompaniment to fish.

fry = 3) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for eels.

fry = 4) a small number of fish for frying especially when presented as a gift (Scottish dialect).

fry = 5) children in the original usage.

fry pond = a pond designed for growth of fry in aquaculture.

ft = foot (0.305 m, 12 inches).

$F_t$  or  $F_t$  or  $F_T$  =  $F_{\text{crash}}$  (the fishing mortality rate corresponding to an equilibrium spawner-per-recruit (SPR) equal to the inverse of the survival ratio at the origin of the stock-recruitment relationship. Used as a biological reference point. A stock exploited indefinitely at  $F_t$  is expected to collapse sooner or later due to recruitment failure, hence the term  $F_{\text{crash}}$ ).

ft/min = feet per minute (0.5080 cm/s, 0.0167 ft/s).

ft/s = feet per second (30.48 cm/s).

$\text{ft}^3$  = cubic foot (957.5 fl oz, 59.84 pt, 28.317 mL, 0.0283  $\text{m}^3$ ).

$\text{ft}^3/\text{s}$  = cubic feet per second (28.317 L/s, 7.841 gal/sec).

$F_{\text{target}}$  = the fishing mortality rate which, with some specified probability level, will prevent  $F_{\text{threshold}}$  from being exceeded.

$F_{\text{threshold}}$  = maximum fishing mortality threshold; exceeding this threshold for one or more years constitutes overfishing.

fuddle = to intoxicate fish (obsolete).

fugu = a dish prepared from the flesh of a Japanese puffer fish (Tetraodontidae), e.g. *Takifugu rubripes*; the gonads are highly toxic and sometimes contaminate preparations of this meal with

fatal results within 4-6 hours on ingestion. About 300 people are killed each year eating fugu. The flesh is bittersweet and a culinary favourite in Japan, prepared by specially licensed chefs.

fugamin = an obsolete synonym for tetrodotoxin (the poison found in tetrodotoxic fishes; also called spheroidine, fugu toxin, or puffer poison. The empirical molecular formula is approximately C<sub>11</sub> H<sub>17</sub> O<sub>8</sub> YH<sub>20</sub>. It is among the most toxic substances known among the non-proteins. It is a sodium channel blocker, preventing transmission of pain signals and is being examined as a non-addictive pain suppressor, 3000 times more powerful than morphine).

fugitive species = a species adapted to colonise newly disturbed habitats.

fuguism = tetrodotoxication (poisoning caused by eating tetrodotoxic fishes).

fuguismus = tetrodotoxication (poisoning caused by eating tetrodotoxic fishes).

fulcra = plural of fulcrum.

fulcres = fulcrum.

fulcrum (plural fulcra) = one of a variable number of specialized, often diamond-shaped, scales in front of the anterior dorsal, anal and caudal fins in lower Teleostomi, e.g. in Acipenseridae, Lepisosteidae, Amiidae and Notacanthidae.

full = 1) of herrings, in good condition.

full = 2) of herrings, full of milt or roe, sexually mature.

full cure = absorption of the maximum amount of salt during curing.

fully exploited = said of a fish stock when removal of individuals is equal to the number of recruits entering the fishery (deaths equal births). In fisheries management this is the point where the population curve is at the maximum sustainable yield (MSY) and any further increase in effort will lead to overfishing. Corresponds to fishing at FMSY (in a classical production model relating yield to effort) or Fmax (in a model relating yield-per-recruit to fishing mortality).

fully fished = a stock where current catches are close to the maximum sustainable yield or maximum average yield. Increases in fishing effort would not increase significantly the yields and would substantially increase the risk of overfishing.

full grown = fish having attained maturity.

full herring = prime herring.

full nape fillet = a fish fillet with the belly on and often with rib bones.

full pickle fish = full cure.

full yarkin(g) = the fastening of every mesh of a fish-net to the head-rope (Newfoundland).

fully exploited = a stock that is not being over- or underexploited.

fully fished = state of a stock which current catches are close to the maximum sustainable yield or maximum average yield. Increases in fishing effort would not increase significantly the yields and would substantially increase the risk of overfishing. Fully fished stocks are primary targets for effort and capacity controls.

fully recruited F = an estimate of fishing mortality for all age groups fully vulnerable to fishing.

Fulton Fish Market = established in 1822 in lower Manhattan, New York (now in the Bronx), this market took fish from across the Atlantic Ocean and was the most important wholesale fish market in the eastern U.S.A.

Fulton somatic condition factor = a figure calculated from length and weight which expresses the plumpness of a fish or the changes in the food reserves stored in muscle. The condition factor (K) is the ratio of the weight of the fish (without the gonads) to the cube of its length ( $K = W/L^3$ , where w = weight in grams less the weight of the gonads and L = standard length in mm).

fulvous = brownish-yellow, tawny.

fumadoes = whole pilchards, dry salted packed in barrels and pressed to about one-third of the original bulk; further fish are added to the barrel and the pressing continued until the barrel is full (U.K.). Also called pressed pilchards, salachini and salachi.

fumet = a concentrated fish stock made with vegetables, spices, wine and fish bones including the head without the eyes. The fish bones and spices are added to blanched vegetables such as carrots, leeks, onions, lettuce and celery and, when the bones start to break down, wine is added and the mixture reduced. Water is added and the mixture cooked for 30-45 minutes and then strained before serving.

fundus (plural fundi) = the bottom of an inward fold.

fundi = plural of fundus.

Fundy multipurpose dragger = a vessel 52-55 feet long, with a crew of three to five men, the wheelhouse and engine forward and the fish hold and gallows aft. Used for otter trawling in eastern Canada.

fungie = a children's term for a salmon, from diseased salmon in the Scottish Tweed River.

fungus disease = any of the fungal infections that can affect fish.

funnel = the narrowing opening into a fish trap.

funnel pit = a pit in the dermal plate at the pectoral appendage articulation containing the remaining scapulocoracoid structure, e.g. in most antiarch Placodermi.

funnel trap = any fish trap where the narrowing shape entraps the fish.

fur ball = a poorly-tied artificial fly.

fur-and-fish post = a station or settlement from which both the fur trade and sea fisheries were carried out (Newfoundland).

fur-bearing trout = furfish.

furcate = forked.

furfish = a taxidermist's mount of a fish, often a trout, wrapped in white fur and said to be a denizen of Canada's northern waters. Sold to tourists.

furikake = fish flour dried after cooking with added seasonings, and then mixed with spices or other ingredients (Japan).

furiotile lake = a partially disjunct body of water, connecting with the mainstream only at high water levels.

furk = to melt the oil from the liver of fish (Scottish dialect).

furkin = hungry, said of fish ready to bite (Scottish dialect). Also spelled forken and forkon.

fursaclew = a trout trap made of dock stalks and shaped like a conical creel (Scottish dialect).

fursaclue = fursaclew.

furuncle = a small area of infection beneath the skin which develops into a raised abscess, forming a lump on the skin typically 10-30 mm across. It may drain externally. The furuncle may develop from the inflamed intestine in fish with furunculosis. Most notable in the disease furunculosis, caused by the bacteria *Aeromonas salmonicida*.

furunculosis = a systemic bacterial disease (*Aeromonas salmonicida*) generally of salmonids but also found in some flatfishes such as turbot (*Scophthalmus maximus*) and in goldfish. Usually occurs in young fish following stress and in spring when temperatures rise and is characterised by loss of appetite as the intestine is inflamed. Septicaemia and haemorrhages in the muscles and other areas occurs. Furuncles (boil-like lesions) develop in body tissues. Also called ulcerative disease of goldfish.

fush = fish (Scottish Highland dialect).

fushi-rui = dried strips of fish produced by repeated smouldering and drying after boiling. Used as a condiment or seasoning for various soups. The term is usually preceded by the name of the fish (Japan).

fusiform = spindle-shaped; tapering at both ends in a streamlined fashion, e.g. Salmonidae, Scombridae.

Fuxi = the Chinese amphibious god, a founder of their civilisation, with a man's or woman's head and a fish tail.

$F_{X\%}$  or  $F_{x\%}$  = the fishing mortality that will reduce the equilibrium spawning potential per recruit to X% of what it would be without any fishing. It is also the F that results in X% equilibrium spawning potential ratio. Also called FX%SPR or  $F_{x\%spr}$ .

[fyke net](#) = a bag-shaped, cylindrical or cone-shaped fish trap, mounted on rings, with funnels which direct the fish into successive compartments. The net is fixed in place by stakes or anchors. Fish are deflected towards the mouth of the bag by leader nets set obliquely on either side of the mouth. Used particularly in rivers. Also called wing net. See also [eel fyke net](#).

## G

G = instantaneous rate of growth (a measure of the weight increase, the natural logarithm of the ratio of final weight to initial weight of a fish in a unit of time, usually a year. When applied collectively to all fish of a given age in a stock, the possibility of selective mortality must be considered (Ricker, 1975). The formula is  $g = [\ln(W_t) - \ln(W_0)]/(t_1-t_0)$  where  $W_t$  is the weight of the fish after  $t_1$  days and  $W_0$  is the initial weight).

g = 1) G.

g = 2) gram(me) (0.0022 lb).

G.S.I. = gastrosomatic index (weight of gut in grammes x 100/weight of fish in grammes (Desai, 1970)).

gaar = gar (2).

Gabelbissen = gaffel bitar (Germany).

Gabelrollmops = rollmops made from fillets of small Baltic herring. These may be with or without skin and are usually prepared without added vegetables (Germany). They are usually in a light vinegar brine and may also be in wine, sauces or mayonnaise.

gabion = a wire basket or cage filled with rocks, stones or gravel. Used to control erosion, stabilise river banks, direct stream flow and improve degraded aquatic habitat, or to form breakwaters and jetties.

gad (noun) = 1) a pliable branch, often forked, passed through the gills of a trout for ease in carrying (Newfoundland).

gad (verb) = 2) to string fish on a gad.

gad = 3) the quantity of fish on a gad (1).

gad = 4) a fishing rod (English and Scottish dialect).

gaef feather = a curved cut made on a finnan haddock (q.v.) as a trade mark (Scottish dialect).

[gaff](#) = 1) a short to long pole with a large hook on the end to land large fish.

gaff = 2) a large fish hook.

gaff = 3) a boat hook.

gaff = 4) to pull a fish from the water with a gaff.

gaff = 5) a traditional "hook" to get people to enter sideshows. The Feejee Mermaid, *q.v.*, is a gaff.

gaff hook =gaff.

gaff point = the sharp tip of a gaff.

gaaffalbitar = smoked herring packed in spiced soya-bean sauce (Iceland); a variant of the products listed below.

gaaffel bitar = semi-preserved fat herring, gilled or headless, with 10-12% salt and sometimes benzoic acid added. The product is ripened in barrels at moderate temperature, then filleted, skinned and cut into 'tidbit' pieces, packed with spiced brine, and also with vinegar or with sauces in cans or glass jars. Also called tidbits, herring tidbits or fork tidbits.

gaaffelbidder = gaaffel bitar (United Kingdom).

gaaffelbitter = gaaffel bitar (Scandinavia).

gaft - a hook for catching eels (archaic).

gag = 1) a device for keeping the jaws of a fish open in order to extract a hook (British). Called jaw spreader in North America.

gag = 2) to gut a fish clumsily (Shetland Isles dialect).

gagline = hauling leg (a wire rope extension of the halving becket joined to the lazy deckie (both *q.v.*). Also called bag becket leg, codend gag and lazy deckie leg).

gaining stream = a stream or a part of a stream where flow increases because of groundwater discharge. Also called effluent stream.

gal = gallon (U.S., 3.785 L).

gal<sub>BI</sub> = gallon (Imperial, 4.454 L).

gal/min = gallon per minute (3.875 L/min).

galeophobia = fear of sharks, a medical term where the sufferer feels anxiety even when viewing a shark in an aquarium or other safe environment. Also called selachophobia.

gallery = part of a fishing stage (*q.v.*) where the catch is landed on its way to the stage head (*q.v.*).

gall bladder = small sac associated with the liver used for storing the bile which is used in digestion. It opens by 4-6 ducts through the dorsal anterior wall of the expanded duodenum, posterior to the pyloric caeca.

gallon = 4.454 L (Imperial), 3.785 L (U.S.). Abbreviated as gal<sub>BI</sub> and gal respectively.

gallon per minute = 3.875 L/min. Abbreviated as gal/min.

galloper = a small vessel of 30-40 tons used in the cod fishery and coastal trade (Newfoundland).

gallows = 1) a frame to hang nets on to dry.

gallows = 2) device on a fishing craft for setting an otter trawl.

gallows = 3) an elevated structure used by fishermen to watch salmon movements.

galouper = galloper.

galuchat leather = a shagreen or sharkskin leather made from a Japanese ray and used for trim on pocketbooks. Also called pearl sharkskin.

galvanotaxis = fish swimming to the anode in electrofishing. Also called electrotaxis.

gam- (prefix) = marriage.

gambusino = a provincial Cuban word meaning nothing, a joke or a farce, hence the expression "to fish for gambusinos" when catching nothing. Origin of the genus *Gambusia* (Poeciliidae).

game fish = 1) fish sought after by sport fishermen, sport fish. Usually restricted to Atlantic salmon and brown trout in Britain, grayling (*Thymallus thymallus*) being considered a coarse fish as it spawns in spring.

game fish = 2) any fish sought by anglers for its fighting ability and eating quality.

game fish = 3) fish reserved for anglers, not for sale commercially.

game warden = a person who upholds fishing laws and regulations may be uniformed and armed.

gametic pool = the total potential production of gametes in any generation of a population that reproduces sexually.

gamma taxonomy = concerning intraspecific variation, ichthyogeography, evolution of traits, patterns and processes in evolution and phylogenetic trends. See also alpha and beta taxonomy.

gamone = chemicals controlling the activity of the sperm prior to and during fertilization.

-gamy (suffix) = concerning fertilisation or sexual union. See agamy, anisogamy, monogamy, polygamy.

gang = the set of the long line gear.

gang boards = in an undecked fishing-boat, wooden plank(s) placed over the midship compartment or "room" in which fish are stowed.

gang hooks = one of a series of fish hooks arranged so that they are effective in all directions.

gang rig = a series of hooks bound or ganged to a line and used with fish or squid baits. Various websites have animated steps showing how to tie this knot.

gang symbol = fish used to indicate membership in a gang, e.g. the Black Tuna Gang involved in marijuana smuggling from Colombia.

gange = 1) twisting fine wire around a fishing line to prevent the hook from being bitten off. Also spelled genge and ging.

gange = 2) fastening an eyeless hook or lead weight to a line. Also spelled genge and ging.

gangen = a branch line with a hook, attached to a main line. Also called tom and stangeon.

gangeing = ganging.

ganging = branch line (a thin strong line by which a hook is attached to the main or back line of a troll or long line).

gangion = a leader line or snood (a short line connecting a fishing line with the hook).

ganoid scale = a non-overlapping or partially-overlapping scale, often rhomboidal in shape, with thick outer ganoine layer (enamel-like substance), a middle layer of dentine and an inner dermal, cosmine bony layer. Grows by addition of material above and below, e.g. in Lepisosteidae, Amiidae and Polypteridae. Lepisosteidae have lost the dentine layer. The scales of Lepisosteidae are called lepisosteoid scales as distinct from paleoniscoid scales of Brachiopterygii.

ganoine = a hard calcified tissue resembling enamel but in many layers; found only in ganoid fishes.

ganz = gange (2) (Scottish dialect).

gap = gape (3).

gape = 1) the opening of the mouth. Its width is the greatest distance across the mouth opening. Its length is the distance from the anteriormost median point on the jaws to the posterior end of the mouth cleft.

gape = 2) the act of opening the mouth. See also agape and gaping.

gape = 3) the space between the point and the shank of a hook, *q.v.* A large gape accepts a larger bait.

gape net = stow net (a conical net secured by boats, anchors or stakes in rivers or areas with strong currents. Also called stow net, swing net).

gape-and-suck feeding = the feeding mechanism of most fishes by means of a negative pressure in the mouth and sucking in the food item. Enabled through rapid expansion of the oral and opercular cavities.

gaping = 1) the act of opening the gape.

gaping = 2) having the mouth continually open, usually a sign of distress such as a respiratory problem.

gaping = 3) parting of fish flakes as the connective tissues break down. Roundfish gape more than flatfish and some species, e.g. ling, *Molva molva* and wolffishes, *Anarhichas* rarely gape. Gaping reduces market value.

gaping for gudgeons = looking out for extremely improbable things. Gudgeons (*Gobio gobio*, Cyprinidae) are used as bait to fool fish by a lie or deception. See also swallow a gudgeon.

gar = 1) a member of the family Lepisosteidae, from the Old English "spear" in allusion to the elongate jaws.

gar = 2) slime on fish (Scottish dialect). Also spelled garr, gaar, gare and garro.

garden fish = fish suitable for keeping in garden ponds; any small, prolific fish species found in gardens and aquaria.

gare = gar (2).

garfangyl = an eel spear (archaic).

gargaropteron stage = a pelagic stage of the chiasmodontid *Kali* characterised by greatly elongated paired fin rays.

garon = garum.

garos = 1) garum.

góros = 2) the enzymatic preparation from hydrolysed fish livers used to mature salted sardines and anchovy (Greece).

garr = gar.

garro = gar (2).

garth = 1) a dam or weir in a river for keeping or catching fish.

garth = 2) a shallow part of a river used as a ford.

garth fishing = catching fish at a garth.

garthman = 1) a man responsible for the upkeep of a garth (archaic).

garthman = 2) the owner or worker of a garth.

garum = a Mediterranean sauce made from whole fish (or livers and viscera, sources vary) placed in concentrated brine and exposed to the sun in jars so that fermentation occurs. Various herbs and spices may be added. In the ancient world mackerel and mullet were favoured species and some reports indicate fish blood was added to the mix. Reputedly and famously very smelly, this may have been old sauce that had gone "off". Garum mixed with water is called hydrogarum, with wine oenogarum, with vinegar oxygarum and with honey mellogarum. See also liquamen and muria. Also spelled garon, garus or garos. Named for the Roman family that produced it.

garus = garum.

garvie = 1) a sprat (*Sprattus sprattus* in Europe, Clupeidae). Also called garvie-herring.

garvie = 2) a small specimen of any fish (Scottish dialect).

garvie-herring = a sprat.

gas bladder = a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Composed of three layers, the tunica externa, the submucosa or middle layer and the tunica interna, all q.v. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, sound receptor, respiratory organ. Often lacking in bottom fishes. Sometimes called swim bladder or air bladder, less appropriate terms. An item in Chinese cuisine. Used to make isinglass, q.v.

gas bubble disease = supersaturated gases (>115-125%) in water entering the body fluids of fish causing bubbles, an embolism. Often seen in gills, eyes, skin and yolk sacs where membranes are the most gas permeable. Fish often swim upside down or vertically, sometimes looking as if they are gasping for air at the surface and may have exophthalmia. Found below power plants in winter when cold water is rapidly heated by passing through condensers, in hatcheries using borehole water and in aquaria when fresh cold water is rapidly heated. Also called air embolism.

gas disease = a disease caused by excess nitrogen or oxygen causing accumulation of gas in body spaces.

gas floater = a fish with a swimbladder able to regulate its position in the water column by gaseous exchange.

gas gland = a structure with numerous blood vessels (retia mirabilia) in the gas bladder that secretes gases from the blood. Also called fascis mirabilis, red gland, red body.

gas supersaturation = the overabundance of gases in turbulent water, such as at the base of a dam spillway. Can cause a fatal condition in fish similar to the bends (see gas bubble disease).

gasher = a small fishing boat with a sharp prow and stern (Newfoundland).

Gaspé boat = a vessel used on the Gaspé peninsula of Québec. About 35 feet long, it is used in longlining and net fishing. Similar to the Labrador boat and the Tancock whaler, these three types of boat are also called double-enders from their sharp stern and bow.

Gaspé cure = split, lightly salted, pickled and cured (2-3 days in brine liquor) cod or white fish dried to a moisture content of 34-36% in the sun or drying kilns. It is amber in colour and translucent.

gastric = relating to the stomach (not all fishes have a differentiated stomach).

gastric artery = a branch of the coeliaco-mesenteric artery (from the dorsal aorta) that runs along the dorsal surface of the stomach and to the left of the pyloric part of the stomach.

gastric vein = delivers blood from parts of the stomach to the hepatic portal vein.

gastric caecum = the posterior prolongation of the stomach found in some oceanic fishes.

gastrohepatic ligament = a remnant of the ventral mesentery and a continuation of the falciform ligament (*q.v.*) attaching the liver to the stomach.

gastrointestinal tract = the digestive system tube from mouth to vent.

gastrolith = a stone in the stomach, deliberately ingested to aid in grinding food.

gastrosomatic index = weight of gut in grammes x 100/weight of fish in grammes (Desai, 1970). Abbreviated as G.S.I.

gastrula = generally in embryology, a postblastula stage in which an archenteron (primitive gut or gastrocoel) forms by invagination of cells through a blastopore, and in which germ layers appear and the embryonic axis is formed. In fishes, an archentron and blastopore may not form and so the term is used for an equivalent stage.

gather = to draw together the ends of a net to enclose the fish.

gauge = a device for measuring the water level relative to a datum, *q.v.*

gauge mesh = a tool used in braiding nets; it regulates the mesh size.

gauge rod = a ruler-like wooden measuring rod used to determine how many gallons a barrel held, *q.v.* See also sample rod and wantage rod.

gauging station = a particular site in a stream, lake, reservoir, etc., where hydrologic data are obtained.

gauntlet fishery = a fisheries method where only juveniles are taken. Once the fish have "run the gauntlet" as juveniles they are safe from the fishery and adults of reproductive age are not fished. Only works with species where the juveniles are large enough to be commercially important.

gazebo = a part of a fishing stage (*q.v.*) where the cod catch is landed on its way to the stage head (*q.v.*) (Newfoundland).

gear = 1) the equipment used for fishing, e.g. gillnet, handlines, hook and line, harpoons, seines, longlines, midwater trawls, purse seines, trolling equipment, rod-and-reel, traps, trawls, spears, etc. but not vessels.

gear = 2) a general term for equipment on a ship such as ropes, tackle, blocks, etc.

gear bank = a store of fishing equipment from which items are leased to fishermen (Newfoundland).

gear-tub = wooden container in which trawl lines are coiled in dory fishing (Newfoundland).

gear conflict = interference by one gear with another on fishing grounds, e.g. trawls damaging static traps.

gear deployment = 1) when fishing gear enters the water, including the first in a series like pots or hooks on a longline.

gear deployment = 2) when trawling gear reaches the level at which it begins catching fish.

gear efficiency = that part of a group of fishes that meeting harvesting gear, are captured by it.

gear ratio = a measure of a fishing reel's retrieval speed; the number of times the spool revolves for each complete turn of the handle.

gear restriction = where the amount and/or type of fishing gear used by fishers in a particular fishery is restricted by law according to area or season.

gear retrieval = 1) when fishing gear leaves the water.

gear retrieval = 2) when the cable of trawling gear starts to be retrieved.

gear retrieval = 3) for serial gear such as longlines and pots when the last element leaves the water.

gear unit = a standard measure used to manage fisheries, e.g. one gear unit is 1000 metres of net.

geer = dan leno hoop (a hoop-shaped dan leno made of bent wood with short rigging ropes wired to the outer circumference. Also called dan leno ring, hoop, hoop bridle, round dan leno and yoke hoop).

gefille fish = a Jewish dish consisting of ground fish mixed with eggs, matzo meal, and seasonings that have been formed into balls or patties then simmered in vegetable or fish stock. The fish used is usually carp, pike or whitefish.

geg = gig (2).

Gegenbauer's mark = the point in the digestive tract near the transition between the oesophagus and the mid-gut where the bile duct enters; the mark is always located posteriorly to the transition between the fore-gut and mid-gut.

gelatin(e) = a soluble protein made from the skin and swimbladders of fish and used in the food industry.

geminate species = a little differentiated species evolved from a close common ancestor, a twin species.

Gemminger's ossicle = one of several bones in the tail of Mormyiformes.

gempylotoxic fishes = those fishes causing gempylid poisoning - certain members of the family Gempylidae, *Lepdiocybium*, *Ruvettus* and *Thryssites*.

gempylotoxism = a form of fish poisoning caused by eating gempylotoxic fishes. Takes the form of diarrhoea following ingestion of the oil in the flesh and bones of gempylids. No other effects are apparent and thus gempylid oil is not toxic in the usual sense of the term.

gen. = abbreviation for *genus*, meaning genus.

gen. et sp. nov. = abbreviation for *genus et species nova*, meaning new genus and species.

gen. nov. = abbreviation for *genus novum*, meaning new genus.

gen. rev. = abbreviation for *genus revivisco*, meaning genus revived for a reinstated genus from an earlier synonymy.

gendarme = hareng saur (salted herring, partially desalinated and cold smoked, whole ungutted or gibbed, also heads and gut removed. The curing time with salt is 2-3 weeks (France). It is called demi-sel when subject to prolonged desalting for more than 46 hours and lightly cold-smoked. Also called gendarme and, in Germany: Lachshering (whole) or Lachbückling (headed)).

gender = a grammatical property of a genus-group name (masculine, feminine or neuter) that affects the way in which Latin or latinised adjectival or participial species-group names are to be spelled, since the gender form of such a species-group name must agree with the gender of the generic name with which it is combined.

gender limit = fish protected by their sex from fishing, often females when spawning.

gene pool = the range of generic variation found in a population, a particularly apt term for fishes.

genecology = the study of the genetic basis of ecological differentiation.

geneonym = genonym.

genera = plural of genus.

generalist = a species with a broad tolerance of environmental conditions and able to feed and reproduce without special requirements.

generation = the average age of parents in the population. This is greater than the age at first breeding, except in taxa where individuals breed only once.

generation time = the time required for a female to produce a reproductively-active female.

generic = pertaining to a genus.

generic designation = a name referring to any multiplicity of objects having one or more properties in common which distinguishes it from other groups of objects; a name itself.

generic name = a scientific name of a taxon of genus rank; the first word in a binomen.

generotype = genotype, the primary type of the type species of a genus.

generotype = see type species.

-genesis (suffix) = origin, descent, development, formation, e.g. see anagenesis, angiogenesis, automictic parthenogenesis, cladogenesis, electrogenesis, gynogenesis, hybridogenesis, ontogenesis, oogenesis, organogenesis, parthenogenesis, photogenesis.

genetic drift = the occurrence of random change in gene frequencies within a small, isolated population over a short period without mutation or selection.

genetic pollution = the breeding of escaped farmed fish with wild stocks, presumed to introduce less fit genes into the wild stocks.

genetically modified organism = an organism, including fishes, in which the genetic material has been altered by means of gene or cell technologies. This usually excludes selective breeding and polyploidy. Abbreviated as GMO.

geniohyoideus = a muscle in two parts, a short anterior muscle from the anterior dorsal surface of the basihyal to the medial surface of the dentary symphysis and a larger posterior part originating from the lateral surface of the ceratohyal. The posterior segment inserts on the tendon of the origin of the anterior segment.

genital cavity = the space at the posterior end of the abdominal cavity separated from the rest by a ring-shaped peritoneal fold (called the genital or coelomic funnel) through which the mature eggs pass on the way to the exterior via an orifice.

genital funnel = a ring-shaped peritoneal fold through which the mature eggs pass on the way to the exterior via an orifice. Also called the coelomic funnel.

genital pad = a many-folded swelling of the epidermis near the vent containing numerous muscle cells. Found in many female Poeciliidae, particularly cave-dwelling species.

genital palp = genital papilla.

genital papilla = a small fleshy projection behind the anus, through which the genital and sometimes urogenital system communicates with the exterior. In males of some species, e.g. Cottidae, the papilla is developed into an intromittent organ. Also called urogenital papilla or genital palp.

genital pore = the external opening of the combined vas deferens.

genital sinus = the united vas deferens of the testes carrying sperm to the exterior between the urinary papilla and the anus through the genital pore.

genitalia = 1) plural of genitalium.

genitalia = 2) reproductive organs involved in copulation, uncommon in fish.

genitalium = gonopodium.

genoholotype = the primary type of the type species of the genus, designated by the author in the original description of the genus. May also be a figure that is regarded as the type of a genus-group name.

genoisotype = genotype plus isotype, *q.v.*

genolectotype = the primary type of the type species of a genus selected from a genosyntype series subsequent to the original description.

genome = the minimum set of chromosomes necessary to ensure the proper functioning of a cell.

genoneotype = genotype plus neotype, *q.v.*

genonym = in nomenclature, the name of a genus. See also geneonym.

genoparatype = genotype plus paratype, *q.v.*

genoplesiotype = in nomenclature, used unofficially to replace plesiotype (*q.v.*) when employed at generic rank.

genosyntype = any individual from the syntype series of the type species of a genus.

genotype = 1) the primary type of the type species of a genus; the specimen on which a genus-group taxon is based, no longer used in zoological nomenclature.

genotype = 2) the genetic constitution of an individual, or all the individuals sharing the same genetic constitution.

gents = gentles.

gentles = maggots, used as bait in Britain. Also called gents.

genus (plural genera) = 1) a category above species and next below the family-group.

genus (plural genera) = 2) an individual taxon of the category "genus" as *Salmo*, *Scomber*, *Bothus*. A nominal genus is a named genus, objectively defined by its type-species; thus, the nominal genus *Osmerus* is always that to which its type-species, *Salmo eperlanus*, belongs. The genus-group is the assemblage of coordinate categories which includes genus and subgenus which is next below the family-group and next above the species group in the hierarchy of classification.

*genus et species nova* = new genus and species. Abbreviated as *gen. et sp. nov.*

genus group = in the hierarchy of classification the group of taxa between the family group and the species group, including genus and subgenus. Names of collective groups and ichnotaxa established at the genus group level are treated as genus group names.

genus group name = a scientific name in the genus group.

*genus novum* = new genus. Abbreviated as *gen. nov.*

*genus revivisco* = genus revived for a reinstated genus from an earlier synonymy. Abbreviated as *gen. rev.*

geodesic = a curve drawn upon a surface such that, if one takes any two adjacent points on the curve, the curve gives the shortest surface distance between them. The spiral rows of scales around and along the body of a fish usually forms a geodesic as may be shown by the fact that a string wound along a row hugs the fish tightly.

geoecotype = a regional ecotype (a population adapted to a restricted habitat as a result of natural selection within a local environment. Nothing to do with taxonomy).

Geographic Information System = a computer system based on geographical coordinates (latitude and longitude) linked to various data such as temperature, habitat type, depth, catches, etc. used in zoogeographical analyses. Abbreviated as GIS.

geographical speciation = speciation occurring during a period of geographical isolation.

geophagy = eating earth or soil, not really applicable to fishes although some take in bottom deposits comprising large amounts of soil-like materials.

geosmin = a compound produced by blue-green algae and actinomycetes giving an earthy-musty flavour to fish that have absorbed them. Such fish are unmarketable.

geostrophic flow = currents in the deep ocean that flow along lines of constant pressure or baroclinic surfaces.

geothermal vent = a vent of hot, mineral-rich water on the ocean floor, usually near spreading oceanic ridges or subduction zones, with an associated fauna including fishes.

geotype = in nomenclature, an unofficial name for a specimen from the type locality. See also topotype.

gephyrocercal = a secondary condition of symmetry in the caudal fin where the original caudal fin has been lost and the interval is bridged by caudal elements. Symmetrical internally and externally, e.g. *Mola*, *Fierasfer*, *Carapus*. Sometimes applied to any secondary internal symmetry - a synonym of diphycercal.

germ ring = the thickened margin of the blastodisc that advances over the yolk during epiboly.

German measles = a parasitic disease of carp evidenced by a red beady surface with blood leaking from ulcers.

germinal epithelium = the tissues of the reproductive organs that produce eggs and sperm.

get fast = accidental fouling of gear on the sea bed.

GH = general, total or permanent hardness. A measure of the overall concentration of calcium, magnesium and other ions. One degree equals about 17.9mg/l. The degree symbol is often replaced with a "d" (i.e. 6dGH). The harder the water, the higher the GH.

ghaniori = a plant in Himachal Pradesh, India whose leaves are used as a fish poison.

ghillie = a fishing guide, particularly in the Celtic parts of Britain. Also spelled gillie and gilly.

ghost carp = *Cyprinus carpio* (koi crossed with mirror carp) with a white to pale cream appearance often stocked in commercial fisheries in Europe. Varies through to black with varying amounts of orange or metallic flecking on the scales.

ghost fish = those fishes caught by ghost fishing.

ghost fishing = accidental catches by lost or discarded fishing gear.

ghost lineage = an inferred lineage based on cladistics but without a fossil record to confirm it.

ghost net = a fish net lost in a storm or from neglect.

ghoti = pronounced as fish; an indication of the complexity and inconsistency of the English language attributed to George Bernard Shaw - gh as in cough, o as in women and ti as in nation means ghoti can be pronounced as fish (and other words have been cited such as trough, rough, laugh station, etc., the original has not been tracked down).

giant cell = 1) found in inflammatory lesions caused by fungal or mycobacterial infections in fish, these cells are formed from macrophages usually by fusion of many cells.

giant cell = 2) alarm substance cells or "clubcells", *q.v.*

giant cell = 3) one of the 1-10 sensory cells in the mormyromasts of type C or tuberous organs; these have a diameter of 40-50 microns and are located in a tightly-fitted capsule and are covered with long thin microvilli.

gib = 1) the kype (*q.v.*) of a salmon.

gib = 2) the gills and guts of a herring (Newfoundland).

gib = 3) the verb for gibbing. See also gip.

gib = 4) to clean fish.

gibb = the noun for gibbing.

gibbing = removal of the guts and gills by inserting a knife in the gill region. Pyloric caeca, ovaries or testes remain in the fish. Usually in reference to herring. Also called gipping.

gibbing knife = a knife with a short blade, used to remove the gills and entrails of herring.

gibbosity = swelling or protuberance, a convex hump, e.g. frontal gibbosity in certain male Labridae.

gibbous = protuberant, convex; a lunar shape between circle and semicircle.

gibfish = a male salmon.

gift = specimen(s) donated to a museum without payment. Sometimes specimens are exchanged without payment to enhance both institutions' collection diversity.

gig = 1) a pole with barbed prongs for striking fish.

gig = 2) an arrangement of hooks dragged through the water to foul-hook fish. Also spelled geg.

gigantism = larger than the normal size of the species.

gigantocerebellum = the greatly enlarged lobi laterales valvulae of the cerebellum which displace the optic lobes laterally and ventrally and cover the brain dorsally and laterally in the Mormyriformes. Also called mormyrocerebellum.

**gigantothermy** = the phenomenon where a large, bulky body in ectotherms (*q.v.*) is able to maintain a higher temperature relative to the environment because of a greater volume to surface area ratio, e.g. in the great white shark.

**gigger** = jigger (a jig for fishing; jigs are hooks or lures of various kinds which are jerked up and down in the water to attract and catch fish. May be carried out by hand or by mechanical devices).

**gild** = 1) assuming a yellow phosphorescent colour due to incipient decay in fish. Also spelled **guild**.

**gild** = 2) of full size and weight, said of marketable fish (Scottish dialect). Also spelled **gyld** and **gjild**.

**gill** = 1) a paired respiratory organ in fishes consisting of gill filaments on the gill arch in the posterior portion of the head and usually providing the primary exchange of gases between the blood and the surrounding water.

**gill** = 2) to catch a fish in a gill net.

**gill** = 3) to become entangled in a gill net.

**gill** = 4) to gut and clean a fish.

**gill** = 5) a ravine or valley (Viking, still in use in England).

**gill arch** = the endochondral skeletal support of the gill which bears the gill filaments and the gill rakers. Consists of pharyngobranchials, epibranchials, ceratobranchials and hypobranchials. Usually 4 in teleosts, can be as many as 16 in some Cyclostomata.

**gill bar** = the tissue between adjacent gill slits containing blood vessels, nerves and skeletal support.

**gill basket** = branchial basket (the network-like cartilaginous skeleton of the gill region of Petromyzontiformes and Holocephali).

**gill cavity** = the area occupied the gills.

**gill chamber** = the cavity containing the gills on each side of the rear of the head, enclosed by the operculum and the branchiostegal membrane.

**gill chamber brooder** = a reproductive guild (*q.v.*) where eggs are incubated in the gill cavity, e.g. the cave fish *Amblyopsis speleae*.

**gill cleft** = gill slit, gill opening.

**gill cover** = the side of the head covering the gills, comprising the bones (mostly the operculum) and associated tissues of the opercular series.

gill disease = see bacterial, dietary, hamburger, nutritional and proliferative gill disease.

gill filament = the thread-like, soft, red respiratory and excretory structure projecting outward from the gill arch.

gill-helix = diverticulum pharyngealis (epibranchial organ (a paired dorsal diverticulum at the posterior limit of the pharynx in certain microphagous fishes. Also called gill-helix, pharyngeal organ, or pharyngeal pocket. In all forms with these organs, except some characids, prominent gill rakers extend into the organ dividing its cavity into two parts, one confluent with the pharynx, and one with the opercular cavity. Small food particles, generally plankton, are retained by the rakers, consolidated by mucus and squeezed out into the oesophagus. Found in Heterotidae, Characidae, Chanoidei, Gonorhynchoidei, Clupeidae and Engraulidae)).

gill lamella (plural gill lamellae) = the transverse vertical platelet on the gill filament, through which capillaries run. The primary gill lamellae carry numerous fine layers called secondary lamellae which are the actual regions of respiration and excretion.

gill lamellae = plural of gill lamella.

gill maggot = a copepod crustacean (*Ergasilus*) parasitising fish gills. There is no intermediate host. Rarely a problem in aquaria but common on wild and cultured fish. Fish gasp, cough, flare the gill covers and have an increased respiration.

gill membrane = the tissue supported by the branchiostegals and forming the lower wall of the gill cavity. Preferably called the branchiostegal membrane, q.v.

gill net = a net suspended in the water at varying depths by means of floats on the upper margin and weights on the lower margin. The mesh size determines the size of fishes caught, the fish being entangled around the gill region or gilled. Also called entangling net.

gill netting = catching fish with a gill net.

gill opening = an external opening leading from the gill chamber. Also called gill slit or branchial opening. Elasmobranchii have 5-7 openings or slits on each side of the head while bony fishes have only one. The opening allows water to exit after passing over the gills for respiration.

gill pouch = the sac containing the gills and communicating with the mouth cavity and with the exterior in Myxini and Petromyzontiformes.

gill raker = one of a series of variously shaped bony or cartilaginous projections on the inner side of the branchial arch. The rakers have epithelial denticles and both their gross and fine structure serves to retain food particles in the mouth. The gill raker count normally includes all rakers, even the rudiments, and is made on the front half of the first arch. Upper and lower gill raker counts may be presented as the upper and the lower (including the central raker), e.g. 9 + 17; or as upper rakers, central raker, and lower rakers, e.g. 9 + 1 + 16. The most anterior and posterior rakers are often small and delicate, easily torn or lost if the arch is removed. Plankton feeders have numerous, crowded, elongate and fine rakers while predators have few, separated, short and stubby rakers.

gill raker sieve = the set of gill rakers on the gill arches acting as a filter or sieve.

gill ray = branchial ray (the cartilaginous rod projecting out from the gill arch into the interbranchial septum which it supports and from the hyoid arch into the first hemibranch. Homologous with branchiostegal. Found in Elasmobranchii and Acanthodii).

gill rod = one of a series of gelatinous rods supporting the pharynx in Amphiox. Also the ossified or cartilaginous rods supporting the individual gill filaments in teleosts.

gill rope = net rope (a float line made of two ropes of opposite twist to prevent kinking).

gill rot = branchiomycosis (a disease caused by the fungi *Branchiomyces sanguinis* and *B. demigrans* found particularly in carp and eels. Respiratory distress is caused by gill necrosis as blood vessels thrombose. Gills become discoloured in patches and rot. Occurs in ponds with high temperatures, excess organic matter and high ammonia levels. Also called European gill rot).

gill septum = the layer of tissue lying between the two hemibranchs. In Elasmobranchii the septum extends out to the outer surface of the body and divides the gill slits. In the Teleostomi the septum is shorter than the gills.

gill sinusoid = the wide, thin-walled capillaries found in the secondary lamellae on the gill filaments. They are short and have large lumina.

gill slit = gill opening.

gill teeth = pharyngeal teeth (teeth on the pharyngeal bones. May be placed in a dorsal and ventral pair, as in most teleost fishes, or in laterally opposing pairs, one set on each side, as in Cyprinidae and Catostomidae. The upper pharyngeal teeth are located on a dentigerous plate on the fourth pharyngobranchials and the lower pharyngeal teeth on the dentigerous plate on the fifth ceratobranchials. The pharyngeal teeth of minnows and suckers are processes on the dentigerous plate of the fifth ceratobranchials and are thus homologous to the lower pharyngeal teeth of other fishes; these oppose a prominent horny pad which rests on a projection from the basioccipital).

gill tuft = a fluffy cluster of gill filaments, e.g. in Syngnathidae. See also tuft gill.

gill-net fishery = any fishery where the gear is limited to the use of gill nets only.

gilled = 1) gill (2, 3 and 4).

gilled = 2) fish caught in a net and entangled in the gill region.

gilled and gutted weight = the weight of fish after the gills and guts (and sometimes the heads) have been removed. The gills and guts are usually discarded at sea.

gillie = ghillie.

gilling = the process of being gilled.

gillnetter = a vessel in eastern Canada that is over 10 gross tons and less than 65 feet long. Used for gillnetting and for longlining.

gills, to the = completely, as full as possible.

gilly = ghillie.

gilson = wire tackle for emptying the cod end of a trawl.

gilt = to become yellow as in fish in the early stages of decay (Scottish dialect).

gin pole = a stout pole on the deck of a fishing boat used to haul fish on board.

gingawtre = a dish of cod and haddock (archaic).

gingeing = ganging.

gimmers = fish gills (English and Scottish dialect).

gip = 1) the point of a fish jaw or the protruding jaw.

gip = 2) gib (3).

gip = 3) a cut made in the belly of a fish in order to gib (3) it, i.e. remove the intestines and associated organs.

gip = 4) herring guts.

gipper = a woman employed in gutting fish.

gipping = gibbing.

gipsy = warping end (a small, spool-shaped, auxiliary drum with filleted flanges at each end fitted outside the main part of a winch for general use in handling fishing gear).

gipsy head = gipsy.

giraultotype = in nomenclature, an unofficial name for a type specimen that is represented by only the distinguishing characters of the species.

gird-an'-girns = a girn on the end of a fishing rod used for trout in deep pools (Scottish dialect).

girdie = a large reel used to pull in stainless steel trolling lines. Also called girdle.

girdle = 1) the skeletal support of the paired fins. See pectoral girdle and pelvic girdle.

girdle = 2) the large reel used to pull in trolling lines. Also called girdie.

girn = a snare or running line, often used for catching trout in deep pools (Scottish dialect). Also see gird-an-girns.

girne = girn.

girth = the circumference, usually the maximum, of the body of a fish, excluding fins.

GIS = Geographic Information System.

gisukeni = small fish species such as gobies, pond smelt and anchovies (and also shrimps) dried, or after baking or boiling, then soaked in a seasoning made from sugar and soy bean sauce. Then dried again by smouldering (Japan).

give one whitings but [= without] bones = to flatter or wheedle (English and Scottish dialect). See also butter a whiting.

gizaboo = gazebo.

gizzard = longitudinal folds in the oesophagus of certain fishes, e.g. Mugilidae, used for grinding and softening food, especially plants.

gizzard erosion = a gut abnormality caused by a dietary toxin.

gjild = gild (2).

glabrous = smooth.

glacial lake = a lake formed from melting ice sheets facilitating fish movements, especially in the Pleistocene.

glacial relict = a relict isolated by events associated with one of the glacial periods when much of northern North America and Eurasia were ice-covered and fishless.

glaciomarine relict = a relict from glacial times and a marine environment, e.g. *Myoxocephalus thompsoni*.

glaive = an eel spear with flattened tines used on sand or hard bottoms as in the English fenland.

glancing = the skimming or bouncing of young (up to four weeks old) Cichlidae such as *Etroplus maculatus* off the side of the adult fish.

glandular triangle = a term proposed to designate a cross section of the ventrolateral-glandular grooves of the sting of a Mylobatoidae, but which was later expanded to include cross sections of the glandular grooves of other fishes regardless of the anatomical position of the groove.

glandula nidamentaria = the anterior portion of the oviduct or Müllerian duct in Elasmobranchii which consists of an anterior albumen gland and a posterior shell gland which secrete the albumen and horny egg shell.

glandula rectalis = rectal gland (an evagination of the terminal portion of the intestine of Elasmobranchii. Function formerly thought to be related to digestion or excretion, but now considered to secrete high concentrations of excess sodium chloride. Found also in the coelacanth *Latimeria chalumnae*).

glans = terminal end of the intromittent organ of Chondrichthyes.

Glasgow capon = a salt herring. See also capon.

Glasgow magistrate = a red herring (*q.v.*) (Scotland). Also called magistrate.

Glasgow pale = a variety of eyemouth cured (*q.v.*) haddock that is smoked so lightly that it has the barest detectable smoky flavour and almost no colour (Scotland).

glass eel = elver (young transparent, cylindrical transformed *Anguilla* about 5-8 cm long, at the stage in their migration where they have reached the coasts and begin ascending rivers and have lost the leaf-like leptocephalus form).

glass float = a hollow ball of glass once used by fishermen to support nets in various parts of the world, now replaced with modern materials such as aluminium and plastics such as styrofoam. Most numerous in the Pacific from Japanese fishing gear, still washing up on shore and now collectibles. The Japanese ones are mostly greenish from the long exposure of recycled sake bottles. Norwegian glass floats were egg-sized and used with hook and line. Also called glass fishing float and Japanese fishing float.

glass fishing float = glass float.

glass trap = a Japanese glass bottle, up to 45 cm in diameter, with a funnel neck entrance, baited and left overnight to catch freshwater fish. The fish are removed via a stoppered hole.

glass-bottom boat = a boat with part or all of its bottom made of transparent material for direct and dry observation of aquatic life.

glassworm = also called white mosquito larvae, these are phantom midge (*Chaoborus* sp.) larvae sometimes used as food in aquaria. Since they are predators, they should not be introduced to fish tanks containing fry.

glaum = to scoop up shoaling fish with a net (Newfoundland).

glazing = protection of unwrapped fish against drying by dipping in cold water, spraying with cold water or brushing with water to form a protective ice layer.

glean = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for herrings.

glenoid region = the region of articulation between the scapula and cleithrum, and the coracoid and cleithrum.

glibe = glipe (1 and 2).

glide = 1) a shallow stream habitat with smooth and slow flow and no turbulence. Velocity is less than 20cm/s.

glide = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for flying fish.

glider = a type of jerkbait that glides from side to side on alternate strokes of the fishing rod.

glint = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for goldfish (coined).

glipe = 1) a newly-spawned fish (Scottish dialect). Also spelled glibe.

glipe = 2) a spent and sickly cod (Scottish dialect). Also spelled glibe.

glitter = dirty slime on fish skins (archaic).

global catch = a limit applied to the total catch from a fishery.

global positioning system = a hand-held electronic system that uses satellite signals to give exact locations on the earth's surface as latitude and longitude. Variously used for locating fisheries, favourite angling spots and scientific sampling locations. Takes all the fun out of getting lost with maps. Abbreviated as GPS.

global sea = all the sea waters of the Earth regarded as one ocean. Also called world ocean.

globiform = a spherical shape, e.g. in porcupinefish.

globoid = ball-shaped or spheroidal.

glochidia = the larval stage of mussels attaching to fish fins and gills and forming cysts.

glochidiosis = the infection of fish tissues with glochidia.

glof = glacial lake outburst floods; the formation of lakes behind glacial debris that may then degrade and cause a flood, devastating to fish and people.

GloFish = a trade-marked name for a zebra fish (*Brachydanio rerio*) containing a gene from a jellyfish that makes the fish bright red or green under normal light and fluorescent under ultraviolet light. Developed to detect environmental pollutants such as oestrogen and heavy metals via an estrogen-inducible promoter and a stress-responsive promoter used to drive the fluorescent colour genes. Also sold as an aquarium novelty.

glogg = glugg.

glomerular = with glomeruli.

glomeruli = plural of glomerulus.

glomerulus (plural glomeruli) = the network of capillaries within Bowman's capsule of the kidney tubule. The network filters water and nitrogenous wastes from the blood.

gloor = fish turned putrid after being hung up to dry (Scottish dialect).

gloss = the sheen or brightness on the cut surface of smoked or thawed fish indicative of quality.

Gloss = the replacement line corresponding to the lowest observed spawning stock (or loss). The slope of the replacement line joining the origin of the stock-recruitment plot to the point given by the fitted recruitment value Rloss, at the lowest observed spawning stock biomass, Sloss. The slope is calculated from Gloss = Rloss/Sloss.

glossal = in reference to the tongue.

glossatella = a disease caused by a ciliated protozoan (*Apilosoma* sp.) causing increased mucus production of the skin and gills, the latter resulting in respiratory problems.

glossohyal = lingual plate (a dermal toothed bone covering and sometimes fusing with the basihyal, e.g. in Osteoglossidae. Also called dermentoglossum, entoglossum, os entoglossum, supralingual or basihyal dental plate).

glossopharyngeal nerve = cranial nerve IX innervating taste buds in the rear of the mouth and on the gill arches.

Gloucester's royal pie = a pie made with lampreys caught in the Severn River of southwest England. The Corporation of Gloucester sent such a pie to the king or queen of the day. Often decorated with gilt ornaments. One weighing 20 lb was sent to Queen Victoria, for example, and was decorated with truffles, crayfish on gold skewers, a gold crown and sceptre on the top and four golden lions at the base, and a banner with the Gloucester coat of arms.

glow-in-the-dark rope = an experimental rope which glows yellow-green for 48 hours, can be recharged in sunlight, and may prove effective at stopping whales from becoming entangled in fish nets as their superior vision should enable them to spot and avoid the nets.

glue = 1) fish glue (isinglass (the glutinous or gelatin-like fluid prepared from the collagen of the outer layer of gas bladders of sturgeons or other fishes. Used in clarifying wines and beers, for jams and jellies, in printing inks and as an adhesive cement)).

glue = 2) a liquid glue made from the bones, fins and skin of fish by heating in water, used cold for bookbinding, for example. See also photo-engraving glue.

glug = glugg.

glugg = dirty slime on fish skins (Scottish dialect). Also spelled glug and glogg.

gluotype = ducotype (a joke name in nomenclature for a type with head of one species affixed to the body of another).

glut = 1) a commercial catch with too many fish to process.

glut = 2) slime on fish skins (Orkney dialect).

glutted = 1) fish with full stomachs.

glutted = 2) said of an overcrowded fishery.

glutton = deep-bodied or obese morphs as a result of an increase in available food. Not of any taxonomic significance but sometimes named as morpha, e.g. *morpha lacustris* as the result of filling of reservoirs and the very high nutrient load from a flooded terrestrial ecosystem (Balon, 1977).

glossohyal = the median dermal toothed bone at the anterior of the hyoid series. It covers dorsally the cartilaginous or bony basihyal. See lingual plate. Equivalent to the basihyal of Elasmobranchii.

gluotype = ducotype (a joke name in nomenclature for a type with head of one species affixed to the body of another).

GM = GMO.

GMO = genetically modified organism, e.g. in fishes such species as zebra danios, *Danio rerio*, and medaka, *Oryzias latipes*, carry genes from other organisms such as the fluorescent pigments of corals. They have appeared on sale in the aquarium trade in some countries but are banned in most countries; Atlantic salmon have been gene modified with a growth hormone from chinook salmon and a cold weather on switch from ocean pout and grow at twice the rate

of normal fish.

gnathal = relating to the jaw. See also gnathic.

gnathic = relating to the jaw. See also gnathal.

gnawer = a fish biting out small hard pieces of food, such as coral, e.g. Balistidae, Monocanthidae and relatives.

go = said of migrating fish, especially salmon (Newfoundland).

go fish = a card game. Two players try to accumulate books of cards by asking the opponent for particular cards (hence go fish).

go fishing = to seek for an obliging or mercenary woman.

go on the plant = to fish on one's own account (Newfoundland).

go sanke = a collective term for highly regarded types of ornamental carp or koi (*q.v.*).

goatfish = 1) members of the family Mullidae.

goatfish = 2) the combined symbols of Enki (*q.v.*), the Sumerian god of water, later appearing as Capricorn, which became one of the signs of the zodiac. See also Ea.

gob = 1) to remove a hook from a fish gut with a gob stick.

gob = 2) an unspecified amount of fish.

gob = 3) a cod's tongue and lips.

gob stick = a short to long forked stick used to remove the swallowed hook from the intestine of a fish caught by longlining (Canada).

gobbeted = a fifteenth century word for dressing trout (preparing this fish for consumption), no longer in use.

God's fish = an oath (archaic, more usually odds fish).

gogar = a large fish hook, larger than usual; a hook used for securing netted fish or a fish caught by line (Scottish dialect). Also spelled goger and goger.

gogel = gug (2).

goger = gogar.

gogger = gogar.

gogl = gug (2).

going fishing = a batter in baseball who swings at a pitch outside the strike zone. Also called fishing trip.

goiter = a dietary disease of fish caused by a lack of iodine.

gold dust disease = an infectious disease caused by dinoflagellates evidenced by a golden or brownish dusty appearance on the fish skin through mucus production. The fish may show irritability, flashing, respiration difficulties and clamping of the fins. A very contagious and often fatal disease in aquaria. Called velvet disease when *Oodinium* (or *Piscinoodinium*), coral fish disease when *Amyloodinium*, and rust from the appearance.

golden caviar = almas, i.e., either the eggs of an albino sturgeon with a light and delicate flavour or those of *Acipenser gueldenstaedtii* at least 60 years of age with a creamy and subtle flavour.

golden cure = a heavily-salted herring cold smoked for 5-6 days instead of several weeks. Also used on freshwater fish.

golden cutlet = cold smoked block fillet of small haddock or whiting. May be dyed, available frozen or chilled.

goldfish = 1) *Carassius auratus*, a cyprinid fish, popular in aquaria but also a food fish in some parts of the world and widely introduced.

goldfish = 2) a proprietary brand of crackers, pretzels and other snack foods.

goldfish cocktail = contains no *Carassius auratus* but is comprised of 2 ounces of gin, 1 ounce of dry vermouth and a quarter ounce of Goldwasser liqueur (a German herbal liqueur with 22-karat gold flakes suspended in it).

goldfish crap = loose translation of the Japanese "kingo no funi" referring to the faecal cast (q.v., faeces hanging from the anus), meaning a sycophant or hanger-on.

goldfish earring= a French fashion of the 1850s where small goldfish where encased in glass globe earrings.

goldfish swallowing = a fad in 1920s America, re-emerging in 1939 at universities, re-appearing at intervals since then, and being banned in various towns. The record allegedly exceeded 300 fish at one sitting. The Belgian city of Geraardsbergen maintains an annual medieval festival where a small fish swimming in a cup of wine is swallowed (goldfish are now used as they are cheap and readily available).

goldfishing = forgetting a task not carried out immediately (slang).

gonad = the organ, ovary and testis, producing the primary sexual products (eggs and sperm), and the sex hormones.

gonad maturation stage = degree of gonadal development; differs according to authors.

gonadal recrudescence = the seasonal growth of ovarian and testicular tissues after a period of quiescence, usually overwinter.

gonadal vein = one of the veins from the gonads (ovaries or testes) draining to the hepatic portal vein.

gonadosomatic index = gonosomatic index.

gonapophyses = plural of gonapophysis.

gonapophysis (plural gonapophyses) = the enlarged haemal arches articulating with the gonopodium in Poeciliidae and Horaichthyidae.

gone fishing = 1) literally gone on a fishing trip.

gone fishing = 2) said of someone unaware of what is happening around them (idiom).

gong show = a crowd of anglers in a confined space often tangling their lines.

gonochoric = adjective for gonochorism. See also gonochoristic.

gonochorism = those species with sexes separate, the male and female reproductive organs being in different individuals, as opposed to hermaphroditic, gynogenetic, and hybridogenetic.

gonochoristic = adjective for gonochorism. See also gonochoric.

gonoduct = any duct that generally transfers eggs or sperm cells.

gonopodia = plural of gonopodium.

gonopodium (plural gonopodia) = the specialized rays at the front of the anal fin in males, modified as a trough or united as a tube, used to transfer sperm to the female, e.g. in Poeciliidae, Horaichthyidae and Embiotocidae.

gonosomatic index = gonad weight expressed as a percentage of whole body weight. Used to describe the gonad maturation cycle. Abbreviated GSI.

good order product = in food inspection, imported fish products for which there is no reason to believe that regulatory requirements have not been met.

googit = said of fish that are soft and on the point of decay (Scottish dialect).

goor = 1) slime scraped from fish (Scottish dialect). Also spelled goorie, goory and gourie. See also gurry.

goor = 2) fish intestines used as bait for other fish such as eels (Scottish dialect). Also spelled goorie, goory and gourie. See also gurry.

goorie = goor.

goory = goor.

gorge = 1) an old piece of fishing gear comprising a short piece of wood, bone, horn, flint or metal, variously shaped, but having sharp ends, usually a central attachment for the line, and embedded in bait. When the fish swims away, having swallowed the baited gorge, it lodges crosswise in the throat. Variants have line attached at one end and the other end pointed, a cross-shape that spreads open when the line is pulled, and the spring-gorge or spring-angle, *q.v.*

gorge = 2) a small, narrow canyon with steep sides with a stream.

gorge fishing = trolling with a dead bait on a double hook which the fish is given time to swallow, or gorge.

gorm = gurm.

gosen = gozen.

goshen = abundant, used of fish when there is a good catch; usually appears in the plural (Scottish dialect).

gospel-shark = a clergyman or missionary (slang).

gotrif = gutriv.

gotriv = gutriv.

goujon = a strip of fillet usually floured, egg-washed and bread-crumbed.

goujonettes de sole = sole filets baked or fried in bread crumbs and a light batter; the origin of fish sticks, *q.v.*

gourie = goor.

governor = the master of the first English fishing vessel to reach a harbour in Newfoundland, having certain privileges for the season. See also fishing admiral.

gowk = to kill a hooked fish by thrusting a stick down its throat (Scottish dialect).

gowp = guddle (1) (Scottish dialect).

gozen = to dry partially in the sun (Shetland Isles dialect). Also spelled gosen.

gozzer = the soft, white maggot of a bluebottle fly bred by anglers in Britain for catching bream (*Abramis brama*).

GPS = global positioning system.

graball = gill net (Australia).

grabbling = noodling (capturing fish by hand, often in murky waters under logs and boulders or in mud holes; may be restricted to use of a hook or snare type device, with or without a short attached line, manipulated by hand when a person is in or under the water. See also hogging and hand-fishing).

gracile = slight, small, slender, light-weight. The opposite is robust or massive. Used to describe anatomical structures and whole organisms.

grade = 1) an artificial taxon as opposed to a clade, *q.v.*

grade = 2) an obsolete term in nomenclature for a taxonomic rank or category between subkingdom and phylum.

graded stream = a stream that has reached almost an equilibrium state in respect of sediment transport and supply.

gradient = rate of vertical fall of a stream or river, expressed as metres per kilometre.

grading = 1) separating fish by size using screens or sieves of appropriate sizes.

grading = 2) sorting fish by hand according to size, quality, class, species, etc.

grading = 3) the size at which fish fillets are sold.

gradistic classification = use of key characters or traits to form groups, e.g. predators or birds, or where groups advance from lowly to advanced grades in a subjective fashion. While members of a monophyletic clade can be predicted to share other characters not used in their definition, gradistically classified organisms may not share properties not included in their definition.

gradualism = evolution with slow and steady rates of change as opposed to punctuated equilibrium, q.v.

graduated = becoming progressively longer in one direction, e.g. said of spines becoming progressively longer along the fin length.

graggan = small fish from a catch divided among the crew as leftovers (Scottish dialect). Also spelled groggan.

Graham's Great Law of Fishing = all fisheries that are unregulated become unprofitable.

gracie = grease.

grain = 1) grains may be used to indicate the optimal weight of line a fly rod will cast. Most modern rods will cast 400 grains easily. 1 ounce is 437.5 grains (or 28.35 grams). Note that one ounce equals 1.42 metric grains, a different measure.

grain = 2) a tine or prong of a fork used to move fish.

grain alcohol = ethanol ( $C_2H_5OH$ ; used as a 70-80% solution in water for the permanent preservation and storage of fish specimens in museum collections. Also called ethyl alcohol or spirit of wine).

rainy caviar = dry caviar (caviar prepared in such a way that the eggs can be separated easily).

graith = to ready fishing tackle (Scottish dialect). Also spelled graithe, greth, greath and grath.

graithe = graith.

gram(me) = 0.0022 lb. Abbreviated as g.

grammatic agreement = in nomenclature, where adjectives in scientific names are given the inflection appropriate to gender, number and case of the noun to which they apply.

grammistian = a bitter tasting toxin secreted in mucus from disturbed Grammistidae (*Diplopion*, *Aulacocephalus*, *Rypticus*, *Grammistrops*, *Pogonoperca*, *Grammistes*). Disturbed grammistids produce a large quantity of mucus, which when confined to a small volume of water becomes frothy and may be lethal to other fishes. The mucus may cause a predator to drop a grammistid that the predator has seized. To humans the mucus has an immediate unpleasant bitter taste accompanied by a light stinging sensation.

Grand Bank(s) = a shoal area (about 50 fathoms deep) south and east of Newfoundland in the Atlantic Ocean, the greatest cod fishery in the world until recently (1990s) and supporting many other commercial species. Many specialised words or words with special meanings derive from this fishery.

Grand Banker = a fisherman working on the Grand Banks.

granivore = a fish that feeds on seeds.

granivorous = adjective for granivore.

grannie = an extra large plaice (Scottish dialect).

granny = [killick](#) (an early form of anchor made from a wooden frame enclosing large stones, with four flukes at the bottom, one of which would dig into the sea floor. Still extant locally in Maritime Canada. Also called keylock, kellick).

Granton trawl = a Scottish-designed otter trawl used in deep water.

granular = having a roughened or pebble-like surface, rounded and non-overlapping. See also granulated.

granulated = rough with small bumps. See also granular.

granulocyte = leucocytes or white blood cells that fight infection, distinguished by deeply staining granular material in the cytoplasm. In fish called acidophils, basiphils, eosinophils and neutrophils.

grapelin = grapple.

grapenel = grapple.

graphite = a material used for making fishing rods; stiff and sensitive.

graphotype = an obsolete term in nomenclature for a preoccupied type, i.e. one on which a name has previously been based.

graple = a light anchor to moor small boats and stationary fishing gear (Newfoundland).

grappling gear = fishing gear that wounds or kills fish rather than trapping them, e.g. harpoons, spears, arrows, a series of hooks, etc. Also called wounding gear.

grase = grease.

grass = grassbed; any area with vegetation.

grass carp rhabdovirus = a virus infecting young grass carp at 23°C; relationship to other rhabdoviruses unknown.

grassbed = an area of marine or freshwater grasses, such as eelgrass.

grate = a fish bone (obsolete).

grated = commercially, a mixture of particles of fish that have been reduced to a uniform size but are discrete and do not comprise a paste. Also called shredded.

grath = graith.

graticule = a network of fine lines, dots, cross hairs, or wires in the focal plane of the eyepiece of an optical instrument. Used to measure the size of such objects as eggs of fishes. Also called reticle or reticule.

gravadlax = gravlax.

gravel = pebbles and small stones 3-76 mm in diameter or 2-64 mm (sources differ). Pea gravel is 3-30 mm. Sometimes used in a broad sense for objects 2-256 mm or in a restricted sense for those 2-4 mm in diameter.

gravel permeability = passage of water through gravel; important in supplying oxygen to incubating fish eggs.

gravel pit = a large cavity excavated for its deposits, often filled naturally with water and stocked with fish.

gravid = 1) full of eggs or embryos.

gravid = 2) ready to spawn.

gravid spot = a dark spot above the anal fin on some livebearers; particularly prominent when they are about to give birth as it is the dark embryos, and their dark eyes, which are visible through the body wall. Some livebearers have an actual spot on the skin in this location but this is not the same structure.

gravity trap = a weighted cylinder that falls down and traps any fish pulling on a bait attached to a trigger mechanism. Also called drum gravity trap.

gravlaks = gravlax.

gravlax = fillets of salmon cured with salt, pepper, sugar and spices such as fresh dill, pressed with weights in a chilled environment, and served sliced thin. Also called gravlox, gravlaks and gravadlax.

gravlox = gravlax.

gravy = fish gravy is fish sauce.

grayling = a member of the genus *Thymallus* (Salmonidae).

grayling reach = grayling zone.

grayling section = grayling zone.

grayling sky = a sky of a silvery-grey colour, like some grayling.

grayling zone = an area of a river lying between the trout and the barbel zones (both *q.v.*) characterised by alternating rapid and moderate currents.

graynel = grapple.

grazer = a fish that feeds on plants.

grease = herring oil (Newfoundland). Also spelled graice and grase.

grease ice = a soupy and thin ice layer at the water surface formed from accumulated frazil ice, *q.v.*

grease trail = a trail used to reach the traditional fishery for eulachon (*Thaleichthys pacificus*, Osmeridae) in the Pacific northwest and bring back the oil from this fish for trade. The oil is solid at low temperatures with the consistency of soft butter, being pungent and golden. The grease is used as condiment, in bread and stews and formerly as a preservative for dried berries. See also cultural keystone species.

greasy = fish infected with *Ichthyophonus hoferi* (possibly a fungus) having flesh with a soft and greasy feel and a sweet, sickly smell, e.g. in *Melanogrammus aeglefinus*, especially smoked haddock, and herring. Fillets have a blotchy appearance which show as white spots in smoked fish. Also called greasers or greasy haddock.

great bank = the Grand Banks of Newfoundland.

great diurnal range = the difference in height between mean higher high water and mean lower low water.

great fish = those fish species of size and commercial importance (Scottish dialect).

Great Fishery = the Dutch herring fishery from late June to early December following herring schools from the Shetlands to the Straits of Dover in the seventeenth century. The herring were salted and barreled and exported, in particular to Catholic Europe (where no meat was eaten on Fridays). The fishery was, along with English cloth, the greatest single branch of European commerce.

Great Herring Pond = the Atlantic Ocean.

Great Law of Fishing = fisheries that are unlimited become unprofitable.

great line = a longline running for many kilometres with thousands of hooks (20 km and 12,000 hooks).

Great Pacific Garbage Patch = a gyre in the central North Pacific Ocean between about 35-42°N and 135-155°W, having large amounts of plastic and other garbage trapped by the currents of the North Pacific Gyre. The size of the patch has been estimated at 700,000 km<sup>2</sup> to 15 million km<sup>2</sup> with perhaps over 100 million tons of debris. A major source of pollution and of plastics ingested by marine organisms as it resembles zooplankton. May form a habitat for fishes in the featureless open ocean. Also known as the Eastern Garbage Patch and the Pacific Trash Vortex.

great suborbital = third infraorbital in Characidae.

greath = graith.

greave = glaive.

grebeshki = a Russian term for the scalloped ridge ornamentation found on the armour of Heterostraci.

greedy hake = a grasping, discontented person.

greedy pig rig = a fishing rig for holding very large baits, designed to avoid bites from smaller, undesired species.

Greek = as used in nomenclature, refers to Classical Greek, not the modern language.

green = raw, of fish eggs, of fish flesh when minimally prepared, of young ichthyologists.

green around the gills = nauseated, as applied to humans. Probably based on uncured, stale fish having a greenish appearance and thus causing a potential customer to feel ill and his cheeks to appear pale.

green bone = the colour of bones in certain fishes, e.g. *Tautogolabrus adspersus* (Labridae), *Belone* and *Tylosurus* species (Belonidae). See also blue bone.

green cure = cod, haddock, herring and hake when unsalted, or green fish.

green eggs = 1) unfertilised eggs stripped from a fish and easily transported.

green eggs = 2) healthy, newly-fertilised salmon eggs vulnerable to shock.

green fish = fish split and stored between layers of salt but not dried. Green fish would keep for months in a ship's hold and were moist or "green".

green fisher = green fisherman.

green fisherman = a migrating fisherman carrying out the cod fishery in a schooner on the Labrador coast, salting the catch aboard the vessel.

green fishing light = fishing light attractor (an underwater light used to attract fish including both bait and larger fish. Variously legal or not depending on jurisdiction. Also called green light from the colour emitted).

green light = green fishing light.

green man = one of a specified number of novice fishermen required by regulation to be carried on a British fishing vessel migrating to Newfoundland.

green manure = plants grown for ploughing into the bed of a dried-up pond as fertiliser for when the pond is refilled.

green roe = green eggs, immature roe, e.g. chinook salmon eggs at 0 days age (stages at 45°F in chinook salmon are green = 0 days, eyed = 38 days, sack fry = 69 days, swim up = 92 days and button up = 115 days).

green salted fish = green fish.

green tuna = an undesirable green colour appearing in some cooked tuna loin often with a urine-like odour.

green water = 1) nutrient enrichment in aquaculture facilities so as to increase the food supply, e.g. for marine fish larvae.

green water = 2) proliferation of green algae in aquaria or ponds, not deliberate.

greenfishery = fishing for cod that were stored as green fish for transport to Europe from the Grand Banks.

greenfishing = the fishery for green fish.

greenhorn = a worker on a fishing vessel on his or her first season.

greening = a grey to green discolouration of canned tuna or in gas-packed, sliced smoked salmon. Trimethylamine and myoglobin are involved although the chemistry is unclear.

gregarious = associating or schooling with others of the same species. Usually implies a harmonious association.

Gregorian calendar = the day following 4 October 1582 of the Julian calendar was designated 15 October 1582 of the Gregorian calendar; the 10 days being dropped in order that the vernal equinox would fall on March 21. The Gregorian calendar was not adopted by England until 1752, but is now in general use throughout the world. However it was adopted only in the twentieth century in Russia and so collection dates on museum samples can appear under a different date when subsequently revised.

greth = graith.

grey cataract = a disease found particularly in goldfish manifesting as a whitish condition in one eye lens.

griap = to catch a trout by groping.

grif-fish = one newly arrived in British India, unaccustomed to the ways and manners of the country (more usually griffin).

grig = a small eel.

grilse = 1) strictly, a mature one-winter salmon ready to spawn and so much smaller than those having spent several winters in the sea. Used particularly in reference to *Salmo salar* and members of the genus *Oncorhynchus*. See also whitling and peel.

grilse = 2) a precociously mature, anadromous salmonid just before or just after entering the river to spawn while still in silvery sea-run condition. It is smaller and usually younger than the true, mature adult.

grilsing = the process whereby a smolt matures in a single year at sea; also refers to the physiological and biochemical changes involved.

Grimsby smoked fish = a Protected Geographical Indication, *q.v.*, comprising fillets of cod and haddock, weighing between 200 and 700 grams, cold smoked to a traditional method at Grimsby. The fish are cream to beige in colour, with a dry texture and a smoked, slightly salty flavour.

grin = girn.

grind = 1) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for blackfish.

grind = 2) a wooden frame on which fishing lines and hooks are wound (Scottish dialect). See also dorro.

grindal worm = a small *Enchytraeus* species fed to older fry and small aquarium fishes.

grinner knot = a knot used by anglers to attach swivels, hooks and lures to the main line; more clinched and stronger than the related blood knot. Various websites have animated steps showing how to tie this knot.

grip = the cork handle of a fly rod, of varying types.

grist = sand, gravel, shell fragments and salt granules on the surface of cod that must be washed off before marketing (Newfoundland).

gristle = cartilage, *q.v.*, especially when ingested by humans.

grizzly = trash collector (a wire fence across a stream used to retain debris and create a dam and a plunge pool; makes habitat for fish and collects gravel for spawning habitat. Also called debris catcher, trash catcher).

grocery bait = bait made from items found in a grocery, e.g. cheese, corn, marshmallows, etc.

grockle fodder = fish and chips; from grockle, a holidaymaker or tourist.

grog fish = the first cod of the season caught off Newfoundland or Labrador. This fish was split, gutted and the head left on was then placed in the hold of the schooner with the other fish. The crew member who took this unique fish from the hold later had to buy grogs or drinks for all the crew when they went to St. John's to sell the catch.

groggan = graggan.

groin = a solid structure built at an angle from a shore of the sea or a stream to prevent erosion from currents, tides and waves or to trap sand.

groin bay = the beach area between two groins.

groin field = groin system.

groin system = a series of groins arranged to protect a beach. Also called groin field.

groot = grute.

grootie barrel = a barrel or jar for storing oil from fish livers (Scottish dialect). Also called grootie pig.

grootie kettle = the pot in which fish livers were rendered for their oil (Scottish dialect).

grootie pig = grootie barrel.

groove = a basket for catching fish (Scottish dialect).

groovy = a sardine (American slang).

groping = tickling trout (archaic), *q.v.*

gross catch = the total weight of fish taken by a fishing unit.

gross protein value = the amount of protein present in fish meal whether available or not.

gross registered tonnage = a measure of a vessel's volume and size, and therefore of fishing capacity.

gross removal = the total live weight of a fish caught during fishing.

gross tonnage = a measurement of ship volume; may be used with engine power as a measure of fishing capacity.

gross weight = the total weight of the fish plus any bags, trays, wrappings, etc. it is contained in, *cf.* net weight.

ground = 1) the bottom of any body of water.

ground = 2) a shoal area with plankton and bait fishes and thus attractive to commercial species. Usually referred to as grounds, fishing grounds, (species name) grounds, e.g. marlin grounds.

ground angling = angling with a weighted line without a float.

ground bait = food used as an attractant for fish in angling. Bread crumbs is the most common base and a wide variety of additives and flavours are mixed in with anglers having their own recipes. Flavours can be sweet, spicy or fishmeal, for example. Also called berley.

ground baiting = throwing food into the water to attract fish; it usually sinks to the bottom and is meant for benthic feeders.

ground basket = a pot or basket made of wood or osier and used to catch eels (or crabs and lobsters). Also called bottom-set pot.

ground cable = the length of wire or rope connecting the otter boards to the wings or towing bridle of a trawl net. Also called sweep line.

ground colour = the background colour or shade, used when describing the overall colour appearance of a fish, without any particular pattern.

ground drave = herring fishing by means of deep-sunk nets (Scottish dialect).

ground drove = ground drave.

ground fishing = fishing with bait on or near the bottom.

ground flake = poles or longers (*q.v.*) placed on the beach for the drying of cod (Newfoundland).

ground glass jar = a glass vessel with a finely ground neck internally and a matching stopper, used to store fish specimens in museum collections. The seal is often very effective and vaseline or some other substance may be used to further prevent evaporation or preservative.

ground line = a line used in ground fishing.

ground net = any kind of fishing net used on the bottom.

ground rope = groundrope.

ground spring = a spring from which water seeps into an area such as a pond or lake; useful for aquaculture.

ground string =fishing line that reaches to the sea floor (Scottish dialect).

ground water = water under the land surface and below the substrate of a water body. May be habitat for hypogean fishes, *q.v.*

groundbait paste = a bait made from stiffened ground bait and used with ground bait for catching such fish as bream (*Abramis brama*) in Britain.

groundfish = fish that live on or near the bottom, usually those sought commercially. Also called bottom fish.

groundling = small fishes that keep at the bottom.

groundrope = the rope forming the front edge of a trawl or demersal seine in contact with the sea bed. Often weighted with a chain and, on rough ground, protected by iron or rubber rollers, cookies, q.v., or bobbins, q.v. See also footrope and foot line.

grounds = see ground (2).

groundwater = adjective for ground water.

groundwater outcrop = a spring.

groundwater upwelling = an underwater spring that arises in lake and stream beds, often used by trout for spawning.

group = in nomenclature, an assemblage of co-ordinate categories - the family-group, genus-group, or species-group; a neutral term for an assemblage of related taxa.

grout = grute.

grow-out = in aquaculture, the stage at which young fish have grown to market size.

grow-out operation = in aquaculture, the process of using any pond or enclosure for rearing of fish to a certain size, usually the market size.

grow-out tank = a separate aquarium for fry to grow to a marketable size or large enough to be placed in an aquarium with adults.

grower fish = fish in aquaculture past the fingerling stage and growing to marketable size.

growing pond = rearing pond (1) an artificial impoundment in which juvenile fish are raised prior to release into the natural habitat).

growing season = that period of a year in which growth takes place in fishes; varies with locality, mostly summer in cooler regions, year round in the tropics.

growler = a small segment of sea ice, usually glacial in origin, and usually greenish in colour, awash with sea water and difficult to see, hazardous to shipping.

growth curve = growth plotted against time on a graph.

growth hormone = a peptide produced in the anterior pituitary of fish regulating growth, metabolism and ion regulation.

growth mark = a layer of material deposited on a scale or bone which reflects the growth of a fish. Also called growth ring or growth zone.

growth model = a mathematical description or representation of the size of a living organisms at its various ages, e.g. the Von Bertalanffy growth model.

growth overfishing = the rate of fishing, as indicated by an equilibrium yield-per-recruit curve, greater than which the losses in weight from total mortality exceed the gain in weight due to growth. This point is defined as Fmax. It means that individual fish are caught before they have a chance to reach their maximum growth potential. Occurs when too many small fish are being harvested, usually because of excessive effort and poor selectivity, e.g. a too small mesh size. The fishery would produce more weight of fish if the fish were harvested at a larger size. A stock can recover in a single fish's lifetime after overfishing stops. See also recruitment overfishing and economic overfishing.

growth pattern = the relative growth of increments during a time period in the life of the fish and the calcified structure being studied for ageing.

growth period = any time period in which growth occurs.

growth rate = 1) the increase in weight of a fish per year (or season), divided by the initial weight; often measured in terms of K in the von Bertalanffy curve for the mean weight as a function of age ( $W = W_{\text{max}} (1 - \exp(-K \text{age}))$ ). Fish grow continuously, although more slowly as they become older. In a managed fishery, fish are allowed to grow to an age which produces good yields, neither too young (still growing rapidly) nor too old (growing slowly).

growth rate = 2) a value that quantifies how much a population can grow between successive time periods. This intrinsic growth rate is often estimated in growth models and is important in evaluating the sustainability of different harvest levels.

growth ring = a layer of material deposited on a scale or bone which reflects the growth of a fish. Also called growth mark or growth zone.

growth zone = a layer of material deposited on a scale or bone which reflects the growth of a fish. Also called growth mark or growth ring.

groyne = British for groin, which is more a part of human anatomy.

grub = a short, plastic imitation of a grub for angling, often used with a weighted jig hook.

grummet = a thick, narrow band of cloth or knitted wool worn around the fingers or palms by fisherman to protect the hand in line-fishing (Newfoundland).

grunion run = 1) *Leuresthes tenuis* (California grunion) and *L. sardinas* (Gulf grunion)(Atherinopsidae) on the coast of California and adjacent northern Mexico, spawn on sandy beaches at very high tides. The eggs remain in the sand and hatch at the next high tide. Fishing regulations restrict capture by hand only.

Grunion Run = 2) separate songs written by Frank Zappa, Jonathan Richman, Peter Yates and others.

grut = grute.

grute = the thick sediment of oil made from fish livers (Scottish dialect). Also spelled grut, groot and grout.

GSI = gonosomatic index (gonad weight expressed as a percentage of whole body weight).

guanine = the crystalline purine found in the dermis of fishes imparting silvery, white or iridescent (blue or green) tones.

guano = fertiliser that can be made of fish; or fish manure.

guanophore = a guanine-containing pigment cell. Also called iridocyte or leucophore.

guardian = 1) a resident placed in charge of fishing gear and premises during the winter for the French Newfoundland migratory fishery (gardien in French).

guardian = 2) warden for a salmon river (Newfoundland).

gubbins = fish offal. Also spelled gubbings.

gubbings = gubbins.

guddle = 1) to catch fish by groping with the hands under the banks or stones of a stream (Scottish).

guddle = 2) to catch minnows or trout by means of a slip-knot on horsehair (Shetland Isles dialect).

gudgeon = 1) *Gobio gobio*, a Eurasian cyprinid.

gudgeon = 2) any member of the Gobioninae (Cyprinidae).

gudgeon = 3) a gullible person.

gudgeon = 4) a bait.

gudgeon = 5) a pivot at the end of a beam or axle on which a wheel turns.

gudgeon = 6) a rod that fits into an eye.

guerillas = fish swimming in the sea of the peasantry, the peasants sustained the guerillas, just as the sea sustains fish (Mao Zedong's famous analogy).

gug (noun) = 1) the slime on fish (Shetland and Orkneys dialect).

gug (verb) = 2) to smear with fish slime (Shetland and Orkneys dialect).

gugel = gug (2).

guggle = gug (2). Also spelled gugl, gugel, gogl and gogel.

gugl = gug (2).

guide = 1) any device used to direct fish to a certain place for capture or avoidance of danger, e.g. lights, bubbles, sound, electricity.

guide = 2) the North American word for the rings along a fishing rod that carry the line.

guide = 3) a professional fishing guide who directs the angler to spots where trophy fish can be found and advises on tackle to catch them. See also ghillie.

guide-stick = a short stick used by dory fishermen as an aid in hauling trawls (Newfoundland).

guideline harvest level = the estimated harvest level that will be allowed in the coming season. This level is judged to be that which gives a sustained yield of fish. It may be adjusted in light of new data.

guild = 1) a group of species, often unrelated taxonomically, that exploit overlapping resources or share common resources by a similar mode. See also feeding guild, reproductive guild and thermal guild.

guild = 2) gild.

gula = the region between the chin and isthmus.

gular = pertaining to the gula, the region between the chin and isthmus.

gular fold = a transverse fold across the throat, anterior to the branchiostegal membranes, e.g. in Hiodontidae.

gular plate = the median or paired, dermal, flat bone(s) between the lower jaws of primitive Teleostomes, below the basibranchials. There is a median gular in Amiidae and some Elopidae, Megalopidae and Albulidae, in some Dipnoi there is a second, posterior median plate while others have two pairs of gulars lateral to the median plate, and in *Latimeria*, *Polypterus* and *Calamoichthys* there is a median plate and a lateral plate on each side. Presumably gulars are serially homologous with branchiostegal rays.

gular region = throat.

gular sac (pouch) = a sac-like protrusion of the pharyngeal region in Southern Hemisphere Petromyzontiformes.

gulbin = gulvin.

gulch = 1) an erosional channel with temporary water or a ravine with steep sides.

gulch = 2) a steep-sided cove.

gulch = 3) a narrow depression in the sea bed.

gulf = an area of sea that penetrates inland, larger than a bay, where the opening is larger than the inland penetration.

gull = a large trout and formerly any large fish (archaic).

gullet = 1) the oesophagus, but used in a general sense by anglers for the upper digestive system of fish where the hook impales.

gullet = 2) a narrow channel in a river, either natural or constructed, used for catching fish.

gulley = gully (3).

gully = 1) an ephemeral stream channel. A small gulch or channel caused by runoff and erosion.

gully = 2) a small pond or series of linked ponds forming the headwaters of a stream.

gully = 3) a deep marine valley. Also spelled gulley.

gully = 4) a barrel or half barrel/tub with handles or rope affixed to its sides, used as a receptacle for salt, fish, bait or cod livers in Newfoundland.

gully stick = a long stick run through the rope handles allowing two people to carry a gully barrel with either end of the stick resting on their shoulders.

gulsh = a variant spelling of gulch.

gulvin = the stomach of a codfish (Newfoundland). Used as garden fertiliser. Term also slang for someone with a great capacity for food. Also spelled gulbin.

gump = guddle (1) (Scottish dialect).

gumph = guddle (1) (Scottish dialect).

gun pump = a fishing method where a school of fish is attracted to an electrode and shot by an air-blast gun.

gunnel = 1) the upper edge of the side of a boat or ship (formerly used to support guns, hence the name). Also spelled gunwhale but pronounced gunnel.

gunnel = 2) a common name for members of the fish family Pholidae.

guns-to-caviar index = a ratio of how much the world spends on fighter jets (guns) and how much on executive jets (caviar), a measure of the geopolitical and economic climate. The ratio

was 10:1 in 1990 when Cold War funding was still being spent but by 1996 this had fallen to about 2:1.

gunwhale = gunnel (1).

guppies = term used for the anchovies found on pizzas. See also carp.

guppy disease = a protozoan disease (*Tetrahymena corlissi*) usually associated with guppies (*Poecilia reticulata*), other poeciliids and occasionally other aquarium fishes. Colonies of protozoans form small white patches, sometimes around the eyes, scales protrude, and internal organs may be affected.

guppy killer disease = guppy disease.

gurdy = a hand or powered winch, used for hauling longlines or trolling. Also called hurdy-gurdy.

gurgise = a fish-pool, lake or pond (Sussex dialect).

gurl = to catch fish with the hands (Scottish dialect).

gurm = to become slimy from handling fish.

gurn = girn.

gurry = 1) wastes from fish such as skin, fins, viscera, mucus, etc.

gurry = 2) oil running out from cod livers (Newfoundland).

gurry butt = large casks for cod livers; as the livers decompose, oil floats to the surface for further processing.

gusel = to dry fish in the wind (Shetland Isles dialect).

gustation = pertaining to the sense of taste.

gustatory = taste.

gut = 1) the alimentary or digestive tract, *q.v.*, and associated organs.

gut = 2) to remove the abdominal organs in preparing fish.

gut = 3) a narrow passage such as a strait or inlet or a channel in shallow water usually formed by a current.

gut = 4) an elongated rock pool open to the sea at one end; a tidal gut.

gut cast = in angling, a piece of strong line or wire between the hook and main line meant to prevent the fish from severing the line.

gut cavity = the belly cavity of fishes.

gut loop = a loop or curve in the gut (an s-shaped gut is common in fishes).

gut rock = a calcium carbonate crystal formed in the intestine of fish in a process which removes excess calcium ingested with seawater. Marine fish may contribute 3-15% of the carbonate in the ocean, helping reduce acidity from excess carbon dioxide.

gut-poke herring = gutpock herring.

gutpock = the stomach of a fish (Scottish dialect).

gutpock herring = a herring which feeds largely on small crustacean (Scottish dialect). Also spelled gut-poke herring.

gutriv = the anus of a fish (Scottish dialect). Also spelled gotriv and gotrif.

guts = a general term, often used by anglers, to denote the internal organs of the belly including the intestine, liver, kidneys, reproductive organs, etc.

gutster = a woman who removes the guts of fish (Scottish dialect).

guttag = a knife used for gutting fish, especially herrings (Scottish dialect).

gutted = fish with guts removed, the gills remaining or not.

gutted weight = weight measured after the guts have been discarded at sea. A conversion factor is used for each species to obtain total weight.

gutter = 1) a person who removes the guts of fish.

gutter = 2) a person who unpacks boxes of herrings (Scottish dialect).

gutter = 3) a deep groove as an anatomical structure.

guyot = a flat-topped sea mount or submarine mountain, a tablemount, rises about 1 km above the sea floor but is 183 m below the sea surface. Named for the American geologist Arnold Guyot (1807-1884).

gyld = gild (2).

gymnoarian = female fishes without oviducts, the eggs passing into the peritoneal cavity and thence by pores or funnels to the outside, e.g. salmonoids, hiodontoids, notopteroids, osteoglossoids, anguillids and the cobitid *Misgurnus*. Compare cystorian.

gymnovarian = gymnoarian.

*Gymnothorax* poisoning = a form of ichthyosarcotoxicosis, q.v., produced by ingestion of moray eels.

gynetype = an unofficial term in nomenclature for a female type specimen.

gynic = adjective for female.

gynogamone = egg secretions which a) accelerate and attract sperm and b) holds sperm onto the surface of the egg or destroys the sperm of other species.

gynogenesis = the consistent production of only female offspring where the diploid or triploid eggs are activated by sperm from the male of a bisexual species but the paternal chromosomes are not incorporated in the embryo. The offspring are thus maternal replicates in morphology and in chromosome number, e.g. in the Poeciliidae *Poecilia (Mollienisia) formosa* and *Poeciliopsis monacha-lucida* and in the Cyprinidae *Carassius auratus* and *Phoxinus neogaeus*. See also hybridogenesis.

gynogenetic = the state of gynogenesis.

gyomiso = fermented fish paste containing salt and wheat bran and inoculated with the fungus *Aspergillus oryzae*.

gyotaku = the Japanese printing art (from gyo = fish and taku = print, impression, rubbing). Paint or ink is applied to a fish and fine paper pressed onto it resulting in a relief print. The Japanese used this, starting in the mid-eighteenth century, as proof of a fish catch, but it is now an art form. An indirect form involves cleaning the fish surface of mucus, sealing gills and anus to prevent leakage of bodily fluids, supporting fins on pieces of wood, and then applying coloured inks to the paper in layers with a silk-covered wad of cotton. Only the eye is painted in with a brush in both methods.

gyre = an ocean current following a circular path within an ocean basin, clockwise in the Northern Hemisphere, counter-clockwise in the Southern Hemisphere. Also used for surface currents in large lakes.

gyri = plural of gyrus.

gyriform = having a convoluted form, like the surface of the human brain.

gyro = a parasitic infestation of fish caused by the trematode *Gyrodactylus*. Also called worm itch.

gyrus (plural gyri) = an outward fold.

gyttja = a sediment type found in lakes with oxygenated bottom waters.

## H

h = annual growth rate (the increase in weight of a fish over one year (final weight divided by initial weight)(Ricker, 1975)).

$h = h$ .

h and g = abbreviation for headed and gutted. Factory ships often remove the head and guts of fish before freezing or landing them.

ha = hectare (107,640 ft<sup>2</sup>, 10,000 m<sup>2</sup>).

ha'netsman = a fisherman who shares in a haaf net (Scottish dialect).

haf = haaf.

haaf = 1) the open sea or deep-sea fishing grounds (Scottish dialect).

haaf = 2) a haven, harbour or port.

haaf bawk = the pole attached to a haaf net whereby it is raised out of the water (Scottish dialect).

haaf boat = a boat suitable for deep-sea fishing; the old haaf boat was divided into six compartments, was 26 ft long, 6-7 ft in the beam, with a hold of 27 inches (Scottish dialect).

haaf fishing = deep-sea fishing (Scottish dialect).

haaf line = a fishing line used in deep-sea fishing (Scottish dialect).

haaf man = a fisherman in the deep-sea fishery (Scottish dialect).

haaf net = a Scottish salmon net in the form of a large bag on a frame (5 m by 1 m). It is held by hand in tidal areas until a salmon is felt entering and then lifted to catch the fish. Haaf is from the Norwegian for open sea.

haaf seat = a deep-sea fishing ground (Scottish dialect).

haafing = 1) deep-sea fishing (Scottish dialect).

haafing = 2) a mode of fishing involving standing in a stream, either at the flowing or ebbing of the tide, with a pock net (q.v.) fixed to a frame, consisting of a beam, 12-14 feet long, having three small sticks or rungs fixed into it. Whenever a fish strikes against the net, the fishermen instantly haul up the mouth of the net above water by means of the middle rung. Also called hauling.

haafure = haaver.

haaver = a line used in deep-sea fishing, to which snoods, each terminating in a hook, are attached (English dialect).

haaving = haafing.

haavre = haaver.

haberdine = a large salted and dried cod.

haberdyn fish = haberdine.

habit = the form and appearance of an organism. Sometimes used in descriptions of species with its Latin version *habitus*.

habitat = the place a species lives, defined by necessary biological and physical parameters such as water quality, temperature, bottom type, vegetation, food supplies, etc., e.g. tidal pool, marsh, reef, continental shelf, river rapids.

habitat fragmentation = the breakup of a habitat into smaller parts, often without the complete needs for a species or community, usually under the influence of man.

habitat improvement = a process in fisheries management aimed at providing better conditions for fish species, especially those of sporting interest or that are threatened.

habitat suitability curve = a graph constructed from evaluating information on the effect of a habitat variable on the growth, survival or biomass of a fish species.

habituation = lack of response, although the capability exists, after repeated stimulation.

habitus = the form and appearance of an organism.

hack = 1) a wooden frame on which fish are hung to dry; often a triangle of wood with spikes to hang the fish from (Scottish dialect).

hack = 2) a wooden grating or fence set across a stream to catch fish or to obstruct their passage (Scottish dialect).

hack = 3) heck.

hackamaggie = the stomach of a fish stuffed with a hash of meat, swimbladders, oatmeal and chopped liver (Shetlands and Orkneys dialect).

hackle = 1) feathers from the neck or back of a bird used in making artificial flies that imitate aquatic insects. Usually imitates the legs of an insect and helps the dry fly float.

hackle = 2) twisting hackles around the hook shank.

hackle gauge = a measuring device used to ensure the hackle length is the same as the hook gap on a classic dry fly.

hackle pliers = pliers used to hold feathers while they are being wound around a hook in fly tying. Usually spring-loaded and with rubber disks to facilitate holding the slippery feathers.

hadal = pertaining to waters below 6000 metres (or 7000 m, sources vary), in reference to its proximity to hell.

hadal pelagic = pertaining to those waters below 6000 metres and above the bottom.

hadal zone = the deepest bottom area, below 6000 or 7000 m (sources vary).

haddock = 1) *Melanogrammus aeglefinus* (Gadidae).

haddock = 2) slang for a purse (Britain).

haddock chowder = steamed flakes of haddock flesh packed with potatoes in cans with broth made from salt pork, flour, onion, fish broth and seasoning; and heat processed (North America).

haddock of beans = a purse of money.

haddock tea = a thin chowder made from haddock (New England).

haddocker = 1) a person fishing for haddock.

haddocker = 2) a vessel used to fish for haddock.

hadobenthic = the ocean floor below 6000 metres.

hadopelagic = the water column below 6000 metres.

haeft = heft.

haek = heck.

haem- = prefix relating to blood. Spelt hem- in American so all listings below may also occur in that fashion.

haemacanth = the haemal spine. Also spelled hemacanth.

haemal arch = the arch which encloses the caudal vein and dorsal aorta and is found on the ventral surface of the more posterior (caudal) vertebrae. In Acipenseridae it is continuous but interrupted in Actinopterygii.

haemal canal = the tube formed by all the haemal arches, through which run the caudal vein and dorsal aorta.

haemal funnel = the lengthening of the haemapophyses beyond the bridging of the haemal arch of the posterior abdominal vertebrae where they almost form a second arch but the haemapophyses never fuse, e.g. in *Atherinops*, *Atherinopsis* (Atherinidae).

haemal rib = a misnomer for a ventral rib (one of the ribs surrounding and protecting the viscera and articulating with the parapophyses of the vertebrae) based on the fallacy that it was homologous with a haemal arch bone. As some fish have ventral ribs on the caudal vertebrae with complete haemal arches, this theory cannot be accepted.

haemal spine = a spine extending downwards from the lower end of the haemal arch in posterior or caudal vertebrae. Also called haemacanth and haemapophysis.

haemal vertebra = a vertebra with a haemal spine, i.e. a caudal vertebra.

haematophagous = eating blood as in lampreys.

haemonephrapophysis = one of the parapophyses of the abdominal vertebrae which are fused at their distal ends. The closed arches formed by them completely enclose the dorsal aorta, the abdominal venous trunk, and the kidneys, e.g. in Pholiidae.

haemapophyses = plural of haemapophysis.

haemapophysis (plural haemapophyses) = the ventral projection of the vertebrae which may unite to form the haemal arch. In the caudal region of Palaeozoic Chondrichthyes they form part of the attachments for basals and radials of the ventral fin lobe.

haemostat = surgical pliers used to remove a hook from a fish.

haev = a small hand-basket used by fishermen to carry bait (Caithness dialect).

haff = a freshwater lagoon separated from the sea by a sandbar or spit (German, sometimes used in English to describe a form of coastline "haff and nehrung", where nehrung is the spit).

Hagerman redmouth disease = enteric redmouth disease (a systemic bacterial disease caused by *Yersinia ruckeri* found mostly in salmonids. Symptoms are severe congestion, septicaemia and haemorrhage in head tissues such as the palate and operculum with the lower jaw being eroded. Internal organs can also be infected. Abbreviated as ERM).

haick = heck.

haift = heft.

haik = heck.

haike = heck.

hail = a periodic radio report by the captain of a fishing vessel on his catch.

hair and lime = the remains of a saltfish dinner, with bones picked out, hashed with potatoes, salt and pepper and served for supper (Yorkshire dialect).

hair cell = a mechano-sensory cell having microvilli. Vibration or pressure deform the microvilli and send an electrical signal to the associated nerve cell. They are often highly directional - deformation in one direction cause rate of discharge to increase while in the other direction it decreases. Hair cells are found in the internal ear (acousto-vestibular) and the lateral line systems.

hair jig = an old-fashioned jig with a skirt made of hair and/or feathers.

hair rig = an extra piece of line with a small loop at the end, tied off of the shank or bend of a hook. Bait is placed on this hair by using a boilie needle, q.v., and held in place by a boilie stop

or piece of grass that is placed through the small loop. The bait is pushed back against the stopper. This rig enables the bait to be moved around by the fish without resistance and when the fish sucks the bait up, the bait and hook enter the mouth. The hook's weight makes its barb point down, hooking the fish when it tries to swim away or hooking the lower lip when trying to spit the hook out.

hair stacker = a cylinder with one end blocked used to line up tips of animal hair in construction of artificial fly wings, tails, etc.

hairbug = a fly made for angling from the buoyant, hollow, winter-coat, slippery hair of deer, elk, antelope or caribou. This hair is made to flare and form a solid shape and trimmed to resemble frogs or mice. Used mostly for warmwater fish but also effective for trout.

hairy Mary = a pie of mashed potatoes and flaked, boiled fish (Scottish dialect).

hairy tattie = mashed potatoes and flaked, dried salt fish as a dish (Scottish dialect).

hak = heck.

hákarl = shark meat buried for 2-6 months and left to ferment. Eaten raw as a popular food in Iceland, for example. Said to have a cheesy taste by those who did not swallow it rapidly or follow it with a shot of the schnapps called brennivin or Black Death. The shark is often the Greenland shark, *Somniosus microcephalus*.

hake = 1) a common name applied to various members of the family Merlucciidae or Gadidae. Most English words involving hake refer to *Merluccius merluccius*, the European hake, fished around the shores of Britain. The word hake is Middle English, possibly from the Old English "haca", meaning hook, itself from the shape of the lower jaw of the fish.

hake = 2) a hook of any kind (English dialect; and see above).

hake = 3) heck.

hake-shaped cloud = a cloud having the shape of a hake; if pointing east and west it indicates rain, if north and south more fine weather (Norfolk dialect).

haked = a large pike (English dialect, from the Old English for this fish).

hal- (prefix) = salt.

halal = permissible under Islamic law. Use in English is often more restricted and in reference to foods. Haram is forbidden. As regards fish, those with scales are haram, those without haram. The latter may include fish that have minute scales not readily visible to the naked eye such as skates and rays. Fish found dead in the water are haram. Interpretations may vary between Shi'a and Sunni muslims and over time, e.g. sturgeons were haram in Iran but this was reversed as ichthyologists determined these were fish with scales.

halocline = a zone in which salinity changes rapidly.

hale = a haul of fish (English dialect).

half blood knot = a knot used by anglers to attach swivels, hooks and lures to the main line. Coils around the main line exert pressure on it when tension is applied to the hook. Various websites have animated steps showing how to tie this knot.

half deal man = a fisherman with a half share in the boat's catch. May provide his own nets but does not own the boat (Scottish dialect).

half drum = a cylindrical wooden container in which dried cod are packed for Brazil (Newfoundland).

half net = 1) halve net.

half net = 2) a half-share in the fish taken by one net in one of Aberdeen's fishings.

half nets man = a fisherman employed by the proprietor of a half-net's (2) fishing rights.

half one's hand = a half share of the catch of cod due to a crew member, the other half share going to the owner or skipper (Newfoundland).

half spent fish = partially spawned fish.

half stoned = a gene name for a zebrafish mutation affecting the ear (initially no otoliths or very tiny otoliths, sometimes one or two otoliths present later). See also einstein, what's up, rolling stones, van gogh, among many others.

half-butt = a half-sized barrel used for storing and transporting dried fish. In Lunenburg, Nova Scotia held 2 quintals (224 pounds).

half-fish = a salmon in its fifth year of growth.

half-grown = term loosely applied to young stages (since any precise distinction involves age determination).

half-grown shad = a dolt (American slang).

half-log = a log split in half with flat side placed down in a stream with a gap between it and the bottom as cover for fish.

half-salted fish = fish taken out of a brine solution before fully cured. Cured with 20-28 parts of salt to 100 parts fish by weight; the product contains 30-40% salt on a dry weight basis. Also called medium-salted fish.

half-saved = partially salted cod (Newfoundland).

half-tide level = a plane midway between mean high water and mean low water. Also called mean tide level.

halfbeak stage = a development stage in Belonidae having a greatly elongate lower jaw and a comparatively short upper jaw.

halfdealsman = a fisherman who shares in the profits (Fife dialect).

halibios = halobios.

halibut broom = halibut killer.

halibut killer = a wooden cudgel used to stun and kill large halibut.

halibut slime = 1) the natural mucus covering of halibut, apparently particularly noxious.

halibut slime = 2) a sea anemone parasitic on halibut, presumably *Hydrichthys* or a related taxon, a colonial cnidarian, whose stolon penetrates the fish skin and feeds on blood and tissues.

halibutter = a vessel engaged in the halibut fishery.

halic = pertaining to saline conditions.

halieuthic = halieutic.

halieutic = of or belonging to fishing.

halieutics = the art or practice of fishing; a treatise on fishing.

Halieutika = the first significant work on sea fishing, written by the Greek Oppian of Corycus between 177 and 180 A.D. It describes cast nets, scoop nets, traps and spears and their use.

haline = salty or regarding salt content where there is a dominance of ocean salt.

haling muff = a mitten used by fishermen to protect their hands when hauling fishing lines into their boat (English dialect).

halinity = the correct term for salinity in reference to the sea where halides dominate, particularly chloride anions.

halinous = containing or consisting of salt, saline.

haliplankton = saltwater plankton.

halioplankton = saltwater plankton.

hallex = alec (a thick sauce or pickle made from the remains of fish from which garum, q.v., has been drawn off. One kind was made from anchovies, another of small herrings. Also spelled allec and allex).

hallucinogenic catfish = an April Fool's joke in 2000 by the editor of *Sport Fishing* magazine in Florida that had some people licking catfish slime for the supposed high.

hallucinogenic fishes = those fishes causing hallucinogenic fish poisoning. Also called ichthyoallyeinotoxic fishes, e.g. certain surgeonfish, chub, mullet, damselfish, grouper, and goatfish. See ichthyoallyeinotoxicism.

hallucinotype = a joke term in nomenclature for a type of a taxon described while the author was under the influence of drugs.

halo = a circle of colour around a spot of another colour.

halo- = salt.

halobenthos = the fauna and flora of the sea bed.

halobiont = an organism that lives in a saline habitat.

halobios = the total life of the sea,

halobiotic = pertaining to life in the sea. Adjective for halobios.

halocline = 1) the region of rapid change of salinity between two layers of different salinity. Analogous to the thermocline, *q.v.*

halocline = 2) a vertical gradient in the saltiness of the ocean.

halolimnetic = pertaining to salt lakes.

halolimnic = pertaining to marine organisms adapted to life in fresh water.

halophil = an organism thriving in or having an affinity for salt marshes or other salty habitats.

halophile = halophil.

halophilous = having an affinity for salt marshes or other salty habitats. Adjective for halophil.

halophobe = intolerant of salty habitats.

halosere = an ecological succession starting in a saline habitat.

halosphere = the marine environment.

halotolerant = tolerating, though not necessarily preferring, a saline habitat.

haltagongi = haltugonga.

halter = a hair noose for catching trout and eels (Devon dialect).

haltugonga = an expression meaning "stop running" used by fishermen to check the run of a halibut that has been hooked (Shetland Isles dialect).

halve = haaf.

halving becket = lifting strap (rope or wire encircling the cod end through loops or rings to close off the rear section and facilitate its loading aboard).

halve net = a bag-shaped net set or held to retain fish as the tide ebbs (Scottish dialect).

ham = fish ham (tuna or marlin flesh mixed with whale and pork in a sausage (Japan)).

hamate = hooked.

hamatype = an unofficial term in nomenclature for a specimen from a type series which was not specified as a holotype or a paratype; a syntype.

hamayaki-dai = a small porgy, sometimes eviscerated, skewered with bamboo pins, then dried after being toasted on a fire (Japan). Also dried in heated, solid salt.

hamburger gill disease = proliferative gill disease (a disease of farmed freshwater fish, mostly in new ponds, caused by a myxosporidean parasite (*Henneguya exilis*, or possibly the myxozoan *Sphaerospora ictaluri* or *Aurantiactinomyxo*). Cysts develop on the gills causing respiratory distress as well as various internal organs).

Hamburgh barrel = a large barrel, chiefly used as a measure of salmon, but also used for holding beer. Named for the German port.

hammer fishing = the use of a hammer to bash rocks and stun fish hibernating beneath them, e.g. used to catch snowtrouts and catfishes in Nepal. See also binning and mell.

hammer-handle = a term use for pike (*Esox lucius*) that are low in weight for their length, having dorsal and ventral profiles parallel likened to a hammer handle. Occurs when food and habitat are limiting.

hampen = a jelly product made by putting kneaded shark meat mixed with ground yams into boiling water (Japan). It has a sponge-like texture and floats when put into soup.

hamular = hook-shaped.

hamulus = a little hook.

hancho hocho = in Japanese 半丁包丁 (half-tool knife), the shorter of two blades used to fillet tuna and other large fishes. The blade is about 1 m long. See also oroshi hocho.

hand bar = hand barrow.

hand barrow = a flat wooden barrow with handles for two people, used mainly for carrying dried fish in Newfoundland. Also called hand bar.

hand brailer = a bag-shaped dip-net used to empty the catch from a large net brought alongside a vessel.

hand feeding = a technique used in aquaculture to ensure that the correct amounts of feeds reach the fish; also used to visually assess fish health.

hand fishing = 1) hand picking or fishing by foot, *q.v.*

hand fishing = 2) noodling (capturing fish by hand, often in murky waters under logs and boulders or in mud holes; may be restricted to use of a hook or snare type device, with or without a short attached line, manipulated by hand when a person is in or under the water. See also grabbling and hogging).

hand flake = a flimsy platform about 4 feet off the ground used for spreading and drying cod in Newfoundland.

hand-gaff = an iron hook attached to a short pole or stick and used in fishing for various purposes.

hand gathering = hand picking.

hand lift-net = a small lift-net operated by hand, with no fixed installation. Also called portable lift-net.

hand line seat = seat (a place where fishermen fish with hand lines (Shetland Isles dialect)).

hand picking = picking up fish from tidal pools or other restricted areas such as pot holes, isolated pools in the dry season and shallow spawning sites (when mating fish are distracted), and when fish are moving overland, e.g. eels, anabantids and channids, or on a spawning migration; perhaps the simplest form of fishing.

hand purse seine = a floating net used to surround fish, and then closed off at the bottom by drawing the lead line tight (pursing the seine). Hand purse seines may have restrictions on use such as hand-power use only and no use of a free-running line through rings to operate the purse.

hand stripping = removal of eggs and sperm by gentle pressure on the abdomen.

hand troll = lures or baited hooks trolled from a boat, set and retrieved by hand or by a hand-cranked device (no powered machinery).

hand tub = wooden hand-barrow with two handles between which a tub was fitted and carried by two people in Newfoundland. Used mainly for carrying round or green fish, and sometimes used for carrying fish manure to the gardens.

hand-flake = a flimsy platform about 4 feet off the ground used for spreading and drying cod in Newfoundland.

handbook = a field guide or identification key without taxonomic conclusions or nomenclatural data.

handgear = handlines used with or without a rod. In deeper waters a hand or mechanical reel may be used.

handi = a wide-mouthed tin or mud vessel used to transport fish eggs (India).

handicap principle = the evolution of a handicap in male Cichlidae which indicates to a female that he can out-compete other males (despite the handicap).

handle-bar tub = hand tub.

handlin = fishing tackle or gear.

handline = a line with baited hooks on short side lines usually laid on the bottom and set and hauled by hand.

handliner = a fishing vessel employing handlines. Boats, canoes and other small vessels may be used for handlining, and no special features are required for working the gear.

handling = operations such as growing, harvesting, processing, packing, storing, transporting, distributing, marketing and selling of fish.

handwritten = text written by hand without the use of a machine. May be of significance in taxonomical works in labelling specimens etc.

hang net = a net with large meshes set vertically on stakes.

hang-and-toot net = toot net (an anchored net extending from a beach into the water or to an anchored boat. It is hauled in when a fish strikes the net (Scottish dialect). Also called toot-and-haul net).

hanging = how netting is mounted according to a specific relationship between the length of that part or the final rope or frame on which the netting is mounted and the length of the netting.

hanging coefficient = the ratio of the horizontal distance occupied by meshes equal in number to the depth of the net in meshes, to the actual depth of the net before hanging.

hangover breakfast = katerfrühstück or rollmops, the German meal of pickled herring wrapped around onion slices or gherkins as a supposed cure for heavy alcohol intake.

hank of fish = fish looped on a string.

hankle = 1) to wind up a fishing line.

hankle = 2) said of fishing nets twisted together. Also spelled ankled.

hana = a small net enclosure in shallow ponds used for deposition of eggs or to raise larval and juvenile fish before release into the general pond environment, e.g. for Indian carps.

haplo- (prefix) = single.

haplotype = 1) the single species contained in a genus at the time of the original description.

haplotype = 2) the set of alleles closely linked on one chromosome and inherited as a unit, providing a distinctive genetic pattern.

haptobenthos = organisms adnate to solid bottom surfaces.

haram = not permissible under Islamic law. Use in English is often more restricted and in reference to foods. Halal (*q.v.*) is forbidden.

harbour master = cod after spawning (Scottish dialect).

harbour rule = a local custom for selecting fishing areas each season (Newfoundland).

hard bait = a general term for any lure or plug made from plastic or wood.

hard bottom = river or lake bottoms composed of rock, sand, gravel or clay.

hard cure = 1) lean fish such as cod that are dry-salted and dried to 40% moisture or less.

hard cure = 2) heavily salted fish.

hard cure = 3) hard smoked fish.

hard dried fish = hard cure.

hard fish = dried or salted fish.

hard release = transporting fish for stocking or introduction in large containers and dumping them directly into a water body without acclimation, *cf.* soft release.

hard roe = eggs of fish, *cf.* soft roe.

hard salted = whole gibbed or gutted herring, salmon or split salmon salted in barrels, vats or watertight basins with 25-33% of its weight of salt.

hard smoked = prolonged cold smoking until the fish is hard as a result of drying. Usually occupies several weeks.

hard smoked herring = red herring (a strongly salted and cold smoked unsplit whole herring. Smoking lasts 2-3 weeks until the fish is hard).

hard stone = otolith (a free calcium carbonate body in the inner ear used for perception of acceleration including gravity. The lapillus lies in the utricle, the sagitta in the saccule, and the

asteriscus in the lagena. Also called statoliths or ear stones. See also otoconium and marginaria).

hard water = water with high concentrations of dissolved calcium and magnesium salts, usually found in limestone areas.

hard water fishing = ice fishing (fishing through holes cut in the ice of lakes or rivers, using specially designed gear and often with a shack positioned over the hole to mitigate the weather conditions).

hard-bellied herring = a female herring.

hardening = the swelling of fish eggs with water once laid, the process taking about 1-2 hours.

hardness = water with a high mineral content, the name deriving from the fact that it is hard to develop a lather for cleaning. The concentration of calcium and magnesium ions in water is expressed as p.p.m. or mg/l of calcium carbonate equivalents. Soft water is 0-17, slightly hard 18-60, moderately hard 61-120, hard 121-180 and very hard 181+ p.p.m. or mg/l (and other sources give soft as 0-20, moderately soft as 20-40, slightly hard as 40-60, moderately hard as 60-80, hard as 80-120 and very hard as >120). Sometimes grains per gallon are used where 1 gpg equals 17.12 mg calcium carbonate/l. Note that different countries use or used different measures: 1 English (Clark) degree or °E is 14.28 p.p.m. calcium carbonate, 1 American degree is 17.1 p.p.m. calcium carbonate (elsewhere as 1 p.p.m.) and 1 French degree (fh) is 10.0 p.p.m. calcium carbonate. However 1 German degree (dh or dH) is 17.9 p.p.m. calcium oxide (and elsewhere as 1 p.p.t.). Confusingly the German dh is used generally for degrees of hardness.

hardwood = wood from deciduous trees such as oak, mahogany, hickory, cherry, apple and beech used to give flavour when burned in smoking fish.

hardy = refers to fish that survive varied environmental conditions; often used in the aquarium trade.

Hardy-Weinberg equilibrium = a state in which no evolution occurs; the frequencies of alleles in the gene pool will remain constant unless acted upon by other agents. The existence of the equilibrium relies on several conditions: population size must be very large, the population must be isolated from other populations, individuals and DNA in the population must mate randomly, and the population cannot be subject to natural selection. It provides a baseline for a non-evolving population, any deviance from this equilibrium indicates an evolving population.

harem = a dominant male fish with a number of subordinate females.

haremic = adjective for harem.

hareng saur = salted herring, partially desalted and cold smoked, whole ungutted or gibbed, also heads and gut removed. The curing time with salt is 2-3 weeks (France). It is called demi-sel when subject to prolonged desalting for more than 46 hours and lightly cold-smoked. Also called gendarme and, in Germany: Lachshering (whole) or Lachbückling (headed).

harenger = a herring seller.

hariwacke = ornamental carp or koi (*q.v.*), being an orange/yellow metallic pattern on a paler metallic body.

harling = fishing by means of fly fishing gear or a lure used with a boat allowed to drop down with the current.

harpagiform = with several sharp or pointed tips.

harpoon = a pointed dart with barbs attached to the end of a line several hundred metres in length, the other end of which is attached to a flotation device or shaft. Harpoons are thrown by hand or by a gun mechanism into a fish like swordfish, bluefin tuna. The fish must be seen before being harpooned so can be selected for size and maturity. See also tuna sticker and spear gun.

harrow = fish rake (a set of hooks attached to a structure such as an iron bar up to 8 metres wide towed behind a boat and impaling any fish encountered).

harry net = a net used to catch or retain fish of a small size, or to ensure a catch of all fish in stream. See also herrie.

Hartweg's Rule = if you do everything right all the time no-one will ever notice, but if you do something stupid, it will immediately be brought to your attention.

Harvard law of animal behavior = when stimulations are repeatedly applied under precisely controlled conditions the animal reacts as it damn well pleases.

harvest = 1) total number or weight of fish that are caught and retained in a fishery over a time period (consumptive harvest). Differs from landings and catch.

harvest = 2) capture and slaughter of fish. When used in aquaculture, the fish are then a food product and subject to different regulations than the previous status as a livestock.

harvest control law = control rule (a protocol for specifying harvest rates in relation to stock status and limit and target reference points. A harvest strategy expected to result in a long-term average catch approximating the maximum sustainable yield. Also called decision rules).

harvest control rule = a variable over which management has some direct control as a function of some indicator of stock status. Constant catch and constant fishing mortality are two types of simple harvest control rules. See also control rule and decision rule.

harvest controls = regulations established for commercial and sport fisheries to ensure that the correct proportion of the different stocks escape to spawn.

harvest guideline = the amount of catch allowed. Differs from a quota in that the fishery is not automatically closed when the guideline is reached.

harvest management = setting regulations for the commercial, recreational and tribal fish harvest to achieve a specified goal within the fishery.

harvest rate = the proportion of a returning run or total population of fish that is taken by fisheries, usually expressed as a catch to escapement ratio.

harvest specifications = the detailed regulations that make up management measures, e.g. net mesh size.

harvester = someone who catches or cultures fish for a living.

harvesting capacity = the capacity of the fishing fleet to harvest fish, usually expressed in terms of vessel size, tonnage, hold capacity or horsepower.

harvesting machine = a mechanism used to extract fish from the water by direct pumping or forced sifting. Relatively few species are caught this way.

hask = a fish basket (obsolete).

hastate = spear- or arrow-head shaped.

Hat-Mehit = a goddess from Mendes in Lower Egypt in charge of the rare fish cult, depicted as human with a fish over her head or as a fish.

hatch = 1) the process of an embryo leaving the egg envelopes; strictly speaking an egg cannot hatch, it is the embryo that hatches.

hatch = 2) the brood hatched at one time.

hatch = 3) transformation of an insect from a swimming to a flying stage at the water surface; a term used by anglers. Hatches attract fish.

hatch boat = a small clinker-built boat, often fitted with a well, in which live cod were conveyed from Gravesend to Billingsgate Fish Market in London.

hatch box = a device used to incubate relatively small numbers of fish eggs. The hatch box is usually located adjacent to a stream, which supplies the box with water.

hatch date = the date a fish hatched.

hatch mark = a circulus formed on otoliths when a fry emerges from an egg.

hatcher = incubator (any apparatus for hatching fish eggs).

hatchery = a place or establishment for spawning, incubating and hatching fish eggs and for the rearing of young for release into the wild.

hatchery rack = a weir or trap where returning adult fish are intercepted for hatchery or other use.

hatchery return = a measure comparing the number of naturally- and hatchery-produced adult fish that return to a hatchery. This estimates the run for a particular watershed.

hatchery stock = a stock that depends upon spawning, incubation, hatching, or rearing in a hatchery or other artificial production facility.

hatchery surplus = returning hatchery fish in excess in broodstock that may be given to tribal groups as part of their treaty rights, transported elsewhere for anglers to catch, donated to food programmes, sold to support hatchery programmes or, if in poor condition, converted to fish meal for hatchery feed, placed in streams for nutrient enrichment, given to wildlife rehabilitation centres or discarded. Such hatchery fish, not caught by anglers, are used as outlined above so that they do not compete with native fish for spawning sites, food or shelter nor do they breed with native fish and produce less fit populations.

hatchery tray = a shallow rectangular tray used in artificial hatching of fish eggs.

hatching = the production of young fish from eggs, either naturally or artificially.

hatching apparatus = incubator (any apparatus for hatching fish eggs).

hatching gland = a transversely oriented set of cells located deep to the enveloping layer on the pericardial membrane, especially during the pharyngula period because of the brightly refractile cytoplasmic granules containing hatching enzymes in the cells.

hatching jar = a bottle used to incubate fish eggs, usually set up so that a current of water passes through to remove waste and ensure adequate oxygen levels.

hatching pond = any pond used for the hatching of fish eggs.

hatching trough = a container used to hatch fish eggs, e.g. an elongated tray is used for salmonids, catfish troughs have paddle wheels to move water over the egg masses and keep them oxygenated.

hatchling = fish larva just out of the egg.

haul = 1) pulling in a net or line to recover a catch.

haul = 2) a measure of effort.

haul = 3) the fish caught in a net.

haul = 4) a pull on a fly line with the non-casting hand to increase line speed and achieve a longer cast.

haul = 5) a single fishing operation.

haul = 6) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

haul home = to close the opening of a net (Newfoundland).

haul net = a net operated from a small boat in shallow water (less than 5 m). The ropes are short and the net is hand-hauled while the vessel is stationary.

haul seine = beach seine (a net used to encircle fish in shallow water; usually operated by two people wading out from shore, the net has lead weights to keep the bottom on the sea floor and floats to keep the top of the net at or near the surface; there may be a bag extending back from the centre of the nets length to increase capture efficiency. The seine may be set from a boat but hauled in from the land. Also called shore seine, drag seine, draw net, haul seine, yard seine and sweep net).

haul the cod off = to deceive, fool or trick (Newfoundland).

haul-up line = a line or rope used to raise a cod trap to the surface (Newfoundland).

haul-up rope = a line or rope used to raise a cod trap to the surface (Newfoundland).

hauling = haafing.

hauling in = the process of pulling in nets or lines to land or to a vessel.

hauling leg = a wire rope extension of the halving becket joined to the lazy deckie (both *q.v.*). Also called bag becket leg, codend gag, gagline and lazy deckie leg.

haurient = a fish shown vertically in heraldry, head upwards. See also naiant.

hauve = haaf.

hawg = American angling slang for a large fish.

hawk = the v-shaped part of a salmon net, leading the fish into a trap (Newfoundland).

hawk end = hawk.

hawk setting = hawk.

hawker = 1) ground bait used to entice fish (Scottish dialect).

hawker = 2) a fish hawker is a seller of fish, usually by travelling about and calling out his wares.

hawseman = a senior crew member of a herring drift fishing boat (Norfolk dialect).

hawser = 1) a strong rope or cable.

hawser = 2) a line attached to the tucking line and horn of a capelin net to keep the horn in place (Newfoundland).

hay net = a fish net adapted for use in gathering hay in fields (Newfoundland).

haywire twist = a knot used in angling to fasten wire to a hook or lure with various twists. Various websites have animated steps showing how to tie this knot.

head = 1) the source or beginning of a stream.

head = 2) the beginning of a pool just below rapids.

head = 3) a body of water kept at a height to supply a mill or other water-powered facility.

head = 4) everything on a fish anterior to the posterior border of the opercular bone and/or its membrane; behind this is the trunk as there is no neck in fish.

head = 5) any round process on a bone.

head = 6) the difference in water level at either end of a strait, channel, inlet, etc.

head = 7) behead, as in preparation of fish for consumption.

head = 8) the seaward end of a wharf or fishing stage.

head = 9) the top part of a fish net.

head = 10) marine or shipboard version of a toilet.

head = 11) the innermost part of a water body (inlet, cove, etc.) or harbour.

head = 12) a shoal of fish.

head = 13) a rise of salmon.

head a barrel = 1) to put a lid on a barrel of fish.

head a barrel = 2) to fill the top of a barrel with fish after shrinkage following the initial filling.

head and lateral line erosion = a nutritional deficiency seen in aquarium fish, usually of vitamin C, aggravated by stress and poor water quality. Holes develop in the head and sometimes along the lateral line. Death may result. Also called hole-in-head disease and lateral line disease.

head back = the rope which runs along the side of a herring net, to which the cork buoys are attached.

head boat = a boat that carries recreational fishers out for an individual fee, rather than renting the whole boat as in a charter.

head canals = the extension of the lateral line system on the head, although differently innervated. The canals open to the surface through pores and contain neuromasts. The canals may be lost and the neuromasts are exposed.

head clasper = a spiny, knob-like structure in male members of the Chimaeriformes used to grasp females during copulation.

head crest = a raised ridge on the head, e.g. in Stichaeidae.

head cut = a cut or preparation of fish that includes the head.

head depth = greatest vertical distance through the head. Vertical distance from the occiput to the ventral surface.

head of a cod, tail of a mackerel = a descriptor for the Queen's warships in late 16th century England, built with a sleek look (greater length in relation to beam).

head gear = the heart-shaped part of a trap net.

head herring = herring used in the packing of Scotch cure herring to fill space at the sides of a barrel so as to give smooth tiers.

head iron = trawl head (a strong, heart-shaped iron frame fitted at each end of a trawl beam to raise it about one metre off the sea bed. The after side is straight and slopes upward of each head to stake the ropes or wires by which the trawl is towed. The sides of the net are seized or lashed at a point close to the ground. Also called head iron and sledge).

head flap = cephalic fin (the thick flap-like fleshy appendage projecting from the pectoral fins lateral to the mouth of Mobulidae).

head gland = adhesive organ (transient larval organs near the mouth used to attach the larvae to the substrate, e.g. in *Protopterus*, *Lepidosiren*, *Acipenser*, *Esox*, *Macropodus*).

head kidney = the mesonephros expanded anteriorly and made up mainly of blood sinuses.

head length = the distance between the most anterior point on the head to the posterior bony or fleshy edge of the opercle (in Teleostomes), to the first gill opening (in Cyclostomata and Elasmobranchii). It may also be taken from the anterior tip of the upper jaw, although the lower jaw projects further. The precise limits anteriorly and posteriorly should be defined in any study.

head of tide = the point in a river where the tidal signal has been damped so that it is insignificant (where the mean range becomes less than 0.2 foot).

head pore = an external opening of the cephalic sensory system.

head race = the channel by which water is led to a water-wheel.

head rope = 1) the rope along the upper margin of a net.

head rope = 2) the length of rope or wire in a trawl to which the top wings and cover netting are attached

head spines = spines on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

head width = the greatest distance between the sides of the head when the opercles are in a normal position.

headed = fish with the head cut or broken off for sale or further processing.

headed and gutted = removal of head and guts of fish by hand or machine for further processing such as freezing.

header = a crew member who removed the heads and guts of cod (Canada). Also saved the liver for oil.

heading = the process of removing the head of fish. May be done by hand or by machine.

heading hole = a hole and chute beneath a table used in cleaning fish so that heads and guts can be quickly cleared by kicking them away.

heading knife = a sharp knife used in heading.

heading palm = a fingerless glove worn on one hand for protection when heading.

headless = without a head, a description of a marketable fish.

headline = the upper rope of a net to which the net is attached and to which floats are generally attached in such nets as seines and trawls.

headwater = the upper reach of a tributary in a drainage basin.

heaf = the gaff hook used by fishermen at Folkestone (Kentish dialect).

heak = flew (a type of fishing net set on poles (Yorkshire dialect)).

heake = heck.

health inspection = a survey of parasites and diseases in a fish or fish population.

healthy as trout = in complete health, perfectly healthy (English dialect).

healthy stock = a fish stock with production levels appropriate to its habitat and lying within the variation in survival for the stock.

heart = 1) the organ which pumps blood and which in fishes consists of (in order of blood flow) the following chambers: the sinus venosus, the atrium, the ventricle, and the bulbus arteriosus

(teleosts) or conus arteriosus (elasmobranchs). Valves occur at the sino-auricular (presumably sino-atrial), auriculo-ventricular (presumably atrio-ventricular) and ventriculo-bulbar junctions; elasmobranchs also have semi-lunar valves in the conus arteriosus. The sinus venosus receives blood from the right and left cardinal veins. The atrium is a single large chamber and blood flows into the ventricle from the atrium when the ventricle relaxes. The ventricle is a thick and muscular chamber with a small opening into the bulbus arteriosus. The bulbus arteriosus is the enlarged base of the ventral aorta and is incapable of muscular pulsation (unlike the conus arteriosus).

heart = 2) the heart-shaped part of a trap with two wings deflecting the fish into a chamber.

heart net = a modified fyke net with a heart and a leader.

heart-shaped = a grade of isinglass (the glutinous or gelatin-like fluid prepared from the collagen of the outer layer of gas bladders of sturgeons or other fishes. Used in clarifying wines and beers, for jams and jellies, in printing inks and as an adhesive cement).

heat exchanger = counter-current heat exchanger (exchange of heat between blood vessels going to surface structures with vessels going deeper into the body. This exchange preserves core body temperatures and reduces surface heat loss so that the fish can function more effectively in cool waters or penetrate cooler waters not otherwise favourable).

heat burn = in commercial preparations, a sticky or tacky condition of the back of a fish as a result of overheating. Ranges from slight (not more than 10% of the back including the fold sticky or tacky, through moderate, to high (more than 50%).

heater = a device to warm the water in aquaria. Thermostats maintain the temperature at the desired level. Heaters are available as submersible heaters, over-the-side heaters, and under-tank coils.

heautotype = a specimen figured by an author as an illustration of a species or subspecies which has previously been described as new by him/her, *cf. plesiotype*.

heaving stick = a stick used to pay out a longline from a dory (Canada).

heavy cure = the process or product of heavy smoking.

heavy damp = cod left a for a long period between salt layers so that much of the body moisture was leached out. This product that was worth much less on the market than was the hard dried variety.

heavy fertilisation = intensive fertilisation of eggs in aquaculture.

heavy salted fish = fish cured with large amounts of salt so that it contains 40-50% salt on a dry weight basis. Moisture content for heavy salted cod is for extra hard dried not over 35%, hard dried not over 40%, dry 40-42%, semi-dry 42-44%, ordinary cure 44-50%, and soft dried over 50% but not exceeding 54%.

heavy salted soft cure = heavily salted fish but without hard drying so that salt content is about 17% by weight and moisture is about 47%.

heavy smoking = prolonged exposure to smoke which preserves and dries the fish.

heberotype = a joke term in nomenclature for a unique type specimen used for molecular analysis that failed and now has only a barcode label to identify it (after Paul Hebert and the Barcode of Life Project).

heck = 1) a wooden or iron grating placed in a river or at a mill dam to obstruct the passage of fish while allowing free flow of water. Also used to prevent salmon leaping into a dam or weir (Scottish dialect). Also spelled haik, hak, hake, hack, haick, haek, haike and heake.

heck = 2) a frame for drying fish (Scottish dialect). Also spelled haik, hak, hake, hack, haick, haek, haike and heake.

heck = 3) a mild oath, seldom used by fishermen who lose a prime fish.

heckle = 1) an artificial fly.

heckle = 2) an engine used for catching fish in the River Ouse, England (archaic).

hectare = 107,640 ft<sup>2</sup>, 10,000 m<sup>2</sup>, 2.471 acres. Abbreviated as ha.

heft = a gaff (Scottish dialect. Also spelled haeft and haift.

hedge = a wall of bamboo or wattle screens leading fish into a trap.

heid = head (12 and 13) (Scottish dialect).

height = 1) fishing height is the vertical opening of a trawl net.

height = 2) in measurement of fish structures this is the vertical distance.

Heincke's law = the size and age of the plaice in a definite part of the North Sea are inversely proportional to the density of their occurrence, but directly proportional to the distance of the locality from the coast and to its depth (biggest fish found in deepest water).

helical = spiral shaped.

helicoprion = a coiled, spiraled or whorled structure of ca. 180 teeth about 26 cm across, the only known remains of certain mid-Permian fossil sharks (also the genus of these sharks).

helicopter rig = an angling rig where the weight is attached at the end of the main line and the hooklength revolves around this a short distance above the weight.

heliotropic = turning towards the sun; many fish are negatively heliotropic.

helminthic glaucoma = an opalescent and opaque eye lens in fishes caused by heightened pressure in the eye through infection by worm parasites.

helophilous = having an affinity for marshes.

hemacanth = haemal spine.

hemal arch = haemal arch.

hemal canal = haemal canal.

hemal funnel = haemal funnel.

hemal rib = haemal rib.

hemal spine = haemal spine.

hemal vertebra = haemal vertebra.

hemapophysis = haemapophysis (haemal spine).

hematophagous = haematophagous.

hem- = haem-.

hemonephrapophysis = haemonephrapophysis.

hemostat = haemostat.

hemi- (prefix) = half.

hemi-vertebra = a half vertebra attached to the endocranum with which the vertebral column articulates.

hemiaulacorhizid = vascularisation of a tooth root through a median groove and 1 or 2 lateral foramina on the inner face, e.g. in Squatinidae and Orectolobidae (Herman *et al.*, 1994).

hemibranch = 1) one of the two vertical rows of gill filaments composing a whole gill or holobranch.

hemibranch = 2) the half gill on the hyoid arch under the gill cover, also called the pseudobranch.

hemicercal = abbreviate heterocercal (type of caudal fin in which the vertebral column extends only a short way into the upper lobe of the fin (which is longer than the lower lobe)).

hemiclonal = inheritance where one genome is passed on unchanged but the other is replaced in each generation, e.g. in the Poeciliidae *Poeciliopsis monacha* and *P. lucida* produce an all-female hybrid called *P. monacha-lucida*. The hybrid produces haploid eggs containing only the

*monacha* genome, the *lucida* genome being discarded. The unisexual fish mate with male *lucida*, the *lucida* sperm is incorporated into the egg which then contains a clonally-inherited *monacha* genome and a new *lucida* genome (Dawley, 1989).

hemihomonymy = in nomenclature when names of a high-level uninomen and a low-level uninomen are identical, e.g. the name of an order and a genus, even when the high-level taxon uninomen is not typified by similarly spelt genus level name, e.g. family-group names and genus-level names ending in -ina.

hemiplankton = organisms that spend only part of their life cycle in the plankton.

hemitrich = hemitrichium.

hemitrichia = plural of hemitrichium.

hemitrichium (plural hemitrichia) = one of the pair of slender rod-like structures that compose a lepidotrich or soft fin ray. The hemitrichia are segmented and often branched. The segments are movably held together by flexible collagenous fibres and joined at their distal tips by fused actinotrichia. Proximally the hemitrichia are expanded to provide for the attachment of muscles (erectors, depressors, and inclinators) and for articulation with the fin ray supports.

hemitype = an unofficial term in nomenclature for a type represented by only half its original body.

hemp seed = a small, black seed boiled until it splits open, used as a bait in England; it is particularly effective for such cyprinid species as *Rutilus rutilus* (from personal experience). May also be used in groundbait as an additive or loose feed.

hen = a female fish. Cock is used for some male fish.

hepat- (prefix) = pertaining to the liver.

hepatic artery = a branch of the posterior end of the coeliac artery that serves the liver.

hepatic caecum = a ventral evagination extending anteriorly in the mid-portion of the intestine in Amphioxo probably homologous with the liver of other chordates.

hepatic float = shark livers, oil-rich and thus contributing to buoyancy.

hepatic portal system = receives blood from the spleen and adjacent parts of the stomach (splenic vein), other parts of the stomach (gastric vein), the pancreas, pyloric caecae and adjacent duodenum (pancreaticoduodenal vein), the posterior intestine (intestinal vein), the capillaries of the gall bladder and the adjacent duodenum (several cystic and duodenal veins), and the dorsal surfaces of the ovaries or testes (gonadal veins).

hepatic portal vein = the main vein of the hepatic portal system, delivering blood from the abdominal organs to the liver.

hepatic sinus = a sinus receiving blood from the liver and opening directly into the sinus venosus, q.v.

hepato- (prefix) = pertaining to the liver.

hepatoma = a liver tumour or a tumour whose cells resemble liver cells. In cultured fish, associated with mold toxins in artificial foods, e.g. aflatoxin B from *Aspergillus flavus*.

hepatopancreas = areas of exocrine pancreas found in the area around the small veins off the hepatic portal vein.

hepatosomatic index = liver weight as a percentage of the whole body weight. Abbreviated as HSI (Htun-Han, 1978).

hepper = a young salmon.

herbivore = feeder on plant material.

herbivorous = plant eating, phytophagous.

herd = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for seahorses.

Heringsstip = pieces of marinated herring fillets, or salt herring with sliced or diced onions, cucumbers, and also with celery, spices and mayonnaise. May have herring milt sauce added (Germany). The minimum herring content is 50%.

herlin = herling.

herling = immature sea trout, *Salmo trutta* (Scottish dialect). Also spelled hirling, hirline, hirrling and herlin.

hermaphroditism = the condition where both ovarian and testicular tissue are present in one individual, though both gametes are not necessarily produced at the same time. Functional hermaphroditism in fishes is known in some Cyprinodontidae, Sparidae and Serranidae. Hermaphroditism may be synchronous (both tissues present at the same time), protogynrous (only one tissue, ovarian, initially, then only testicular), or protandrous (only one tissue, testicular, initially, then only ovarian). *Rivulus marmoratus* (Cyprinodontidae) is unusual in that it produces an egg and then fertilises it, a self-fertilising hermaphrodite. See also primary male and secondary male.

hermaphroditic = with male and female reproductive organs in the same individual, as opposed to gonochoristic.

hermaphroditism = the variant of hermaphroditism.

herpesvirus disease = a disease of salmonids such as fry of rainbow trout (*Oncorhynchus mykiss*) caused by *Herpesvirus salmonis*. Causes lethargy, gill pallor, popeyes, eye and fin base haemorrhages, necrosis of the myocardium, liver, kidney and posterior intestine, and affects

the blood (low haemotocrit and immature erythrocytes). Mucoid faecal casts trail from the vent because of the necrosis of the posterior intestine.

herpobenthos = organisms growing or moving through mud.

herrie = 1) to denude a stretch of water using a harry net (Scottish dialect).

herrie = 2) to use a harry net (Scottish dialect).

herring = 1) Atlantic and Pacific herring, *Clupea harengus* and *C. pallasii* (Clupeidae), the former in particular figuring prominently in fisheries in North America and Europe and having various terms peculiar to its fishery. Many of these terms are in dialects of English or are archaic. Herring is derived from an Old English word.

herring = 2) to manure with herring.

herring bait = herring used as bait.

herring baiting = the quantity of herring taken aboard a vessel for use as bait in trawl fishing for cod on the Grand Banks, Newfoundland.

herring barrel = 1) a barrel containing at least 1000 herring as early as 1357 in England; later, in 1713, the barrel contained 1440 herring.

herring barrel = 2) in 20th century Germany, 100 kg of herring.

herring bodies = neurosecretory material accumulated in large masses in the neurohypophysis.

herring bone = 1) a large wooden tray with handles, legs and cross pieces used to suspend and carry strung herring to a smokehouse.

herring bone = 2) a pattern consisting of rows of short, slanted parallel lines or pieces of material, alternating in direction of the slant row by row. Used in parquetry, marquetry, embroidery and weaving. Also spelled herringbone.

herring bone = 3) method of climbing a ski slope with the tips of the skis pointed outward. Also spelled herringbone.

herring bone = 4) to sail through an ice-field in a zig-zag pattern to locate seals (Newfoundland).

herring brook = herring pond.

herring caller = a man stationed on a cliff, watching for gulls flying low as an indicator of herring schools. See also huer, balker, conder.

herring carrier = a vessel about 52-65 feet long with a crew of two and often with partitioned central fish holds. Used to carry herring.

herring choker = 1) a person living in an area where herring are caught and pressed for oil. Choking derives from killing herring in a gill net, the squeaking noise made when a herring is removed from a gill net, from the act of killing them by removing them from the water, or a combination of the above. See also choke.

herring choker = 2) an inhabitant of New Brunswick, Canada based on the assumption maritimers eat mostly fish, such as herrings.

herring choker = 3) a Scandinavian or someone of Scandinavian descent, even landlocked communities such as those in Minnesota.

herring cob = a young herring (archaic).

herring cooper = a maker of casks in which herring are packed.

herring destroyer = herring choker (3).

herring dodger = a large and shiny piece of metal placed between a sinker and the bait. It causes side-to-side gyrations which are transmitted to the bait.

herring drewe = a drove of herrings.

herring drift = a large net for herrings, 8 feet deep, 11 fathoms long.

herring dub = the sea.

herring fare = the season for catching herrings, beginning before the end of harvest.

herring flash = an old Scandinavian name for the northern lights or aurora borealis. The aurora was supposed to be the reflection of a huge schools of herring onto the sky.

herring gib(b) = gills and guts of herring.

herring gibber = a man who guts herring.

herring gutted = thin, bony or wiry, said of people and animals.

herring gyte = herring spawn found adhering to herring nets during fishing operations.

herring hang = a place where herrings are dried, the fish being hung on sticks (Sussex dialect). Also called dee or deese.

herring horse = a frame, usually on four legs, used for supporting or holding a load of herring.

herring in sour cream sauce = salted herring fillets, partly desalinated and marinated with vinegar, or marinated herring fillets prepared with different supplements such as wine, spices, sour cream, sweet cream, sieved herring milt, onions, cucumbers, etc.

herring in wine sauce = vinegar-cured herring fillets packed in a sauce made from white wine, vinegar, onions, sugar and spices. Also canned precooked herring fillets, packed in liquid wine sauce or with binding material, thickened sauces, with wine as flavouring. May be named according to the kind of wine, e.g. in Malaga wine sauce.

herring king = king herring (a herring of a blood-red colour which reputedly acts as pilot to a school of herrings. If caught, it is always thrown overboard by the fishermen, as keeping it would bring bad luck).

herring man = a herring fisherman.

herring meal = fish meal prepared from herring and herring waste.

herring milt sauce = herring milt mixed with vinegar sauce and strained through a sieve to remove membranes. Used for packing vinegar cured herring products.

herring net = 1) a seine used to enclose schooling herring.

herring net = 2) a type of stationary net in which herring enmesh themselves.

herring oil = fish body oil extracted from herring usually by cooking and processing.

herring pasty = the charter of the Corporation of Yarmouth in England required that town to send one hundred herrings baked in four-and-twenty pasties to the king annually.

herring piece = herring spear.

herring pond = the sea (slang).

herring pool = the English channel.

herring pound = an enclosure, usually for herring, maintaining fish alive over long periods.

herring pumper = a medium to large Cape Island vessel (*q.v.*) having an 8-10 inch herring pump and a scaling and dewatering box to collect fish scales during pumping.

herring purse seiner = a vessel 52-65 feet in length with a crew of five or six and the wheelhouse and accommodations located forward. Used for catching herring only.

herring rake = a wooden pole with a flattened head having a comb-like structure used with a downward stroke to catch herring by impaling them.

herring ribs = a lanky, bony person.

herring roe on kelp = a fishery where the eggs of herring are gathered from seaweed fronds in the Pacific northwest.

herring salad = vinegar cured, mostly diced, herring fillets or salt herring, mixed with diced cucumbers, onions, vegetables, spices and mayonnaise. This product may be packed

unprocessed in containers which are not air-tight, or in glass jars or cans. Recipes vary from country to country, e.g. red herring salad has added pickled red beetroot.

herring savoury = an attempt to make the herring more marketable in Britain in the 1950's. Most herring were pickled and exported to Europe. The savoury was a fish stick (*q.v.*). Ironically, it was tested against a bland version using cod called fish fingers (*q.v.*) but the public much preferred the latter.

herring scale = Canadian 5-cent coin last minted in 1921, so-named because they were small and thin.

herring school = herring scull.

herring scull = the appearance in inshore waters of schools of herring (Newfoundland).

herring signs = swarms of minute fish which come as forerunners of the herring shoals.

herring siles = herring signs.

herring silver = money in place of herrings given to to provide for a religious house.

herring snapper = slang for a Scandinavian. See also herring choker.

herring soam = herring fat.

herring spear = the rushing noise of the flight and the cries of redwings, whose migration takes place about the herring fishing time. Considered a good omen for fishing (Kentish dialect).

herring station = a harbour where herring are processed for export and from which the herring boats set to sea.

herring tack = a shoal of herrings.

herring tidbit = gaffel bitar (semi-preserved fat herring, gilled or headless, with 10-12% salt and sometimes benzoic acid added. The product is ripened in barrels at moderate temperature, then filleted, skinned and cut into 'tidbit' pieces, packed with spiced brine, and also with vinegar or with sauces in cans or glass jars. Also called tidbits or fork tidbits).

herring trip = a voyage to the fishing banks to catch cod using herring as bait in trawl fishing (Newfoundland).

herring tub = an 18-gallon (68.1 l) wooden container (Newfoundland).

herring warp = bush rope (the main rope to which the row of herring drifting gill nets are attached).

herring weir = a weir built to catch herring (*Clupea harengus*).

herring weir seine boat = an open boat about 28 feet long with an inboard motor. Has three man crew and is used to tend herring seines, traps and weirs.

herring wife = a woman who sells herrings.

herring work = herring bone (2) work.

herring-gutted = lanky, thin (slang).

herringbone = adjective for herring bone, alternative spelling of herring bone.

herringed to death = said of land over manured with herrings (Maine).

heteracanth = having fin spines asymmetrical and more or less skewed alternatively left and right.

hetero- (prefix) = different, other, dissimilarity, other than usual.

heterocercal = the type of tail fin in which the vertebral column turns upwards into the upper lobe which is longer than the lower. Asymmetrical externally as well as internally, e.g. Elasmobranchii, Acipenseridae, Polyodontidae and in many larval Teleostomi. May also be used for an asymmetrical caudal fin but with epicercal defining upper lobe longer and hypocercal the lower lobe longer.

heterodont = more than one type of teeth within the same fish, e.g. Anarhichadidae, *Heterodontus*. Diphaglic heterodonty has teeth differing in the upper and lower jaws, monognathic heterodonty within one jaw.

heterodonty = the condition of heterodont teeth.

heterogeneous = a taxon which includes two or more elements which belong to one or more taxa.

heterolecithal = eggs with an uneven distribution of yolk.

heterophagous = adjective for heterophagy.

heterophagy = feeding on a wide variety of foods.

heterosis = hybrid vigour.

heterospecific = belonging to different species.

heterothermic = cold-blooded.

heterotype = a type which has been derived by combining the characters of two or more different species, e.g. fossils.

heterotypic = differing from the type or from normal, abnormal.

heterotypic school = a well-defined group of many kinds of fishes, cf. homotypic school.

heterotypic synonym = a synonym based on different nomenclatural types.

heterotypical = an unofficial term in nomenclature for a genus which includes several generically unrelated species.

heterozygous = having two different alleles of the same gene.

hettle = a rocky bottom lying between the roadstead and the shore on the Firth of Forth (Scottish dialect). See out of the hettle into the kettle.

heva = a cry to warn fishermen of the approach of pilchards (Cornish dialect). See also hubba.

hevah = heva.

Hewett ramp = a fish shelter comprising a log across a stream with a submerged platform extending horizontally and downstream from it.

hexamitiasis = a chronic internal parasitic infestation of cichlids and salmonids characterised by increased mortality, dark colouration and reduced appetite. White stringy faeces are seen. Caused by a flagellate protozoan, *Hexamita* (or *Octomitus*, *Spironucleus*), with additional bacterial infections. Also called hole-in-head disease as ulcerations of the head and lateral line may develop but not necessarily the same as the nutritional deficiency under this name.

hiatus = a gap, e.g. unoccupied space between the distributions of two species.

hibernaculum = the place where an organism overwinters.

hibernal = of or pertaining to winter, hiemal.

hibernation = overwintering in a torpid state. Also called winter sleep.

hibernium = an area or group of fishes for overwintering.

*hic designatus* = designated here; used to indicate clearly that a lectotype or neotype is being selected by the author.

hicker = a tangle in a line or net (Newfoundland).

hide = cowhide attached under the cod end of trawl to protect it from abrasion.

hiemal = of or pertaining to winter; hibernal.

hierarchy = used to refer to the classification system where categories are ranked by increasing inclusiveness; or all the categories of taxa arranged in order according to their ranks.

hierarchical system = hierarchy.

high dory = the dory crew with the largest catch of cod (Newfoundland).

high grading = the discarding of a portion of a vessel's legal catch that could have been sold to have a higher or larger grade of fish that bring higher prices. It may occur in quota and non-quota fisheries. Generally illegal as fish resources are wasted. Also, since these illegal discards are not recorded, stock assessments can be unreliable and fishery management is difficult.

high male = a male fish with highly developed secondary sexual characteristics (colour, tubercles, fin enlargement, etc) and highly developed testicular tissue.

high nutritional value = a term used to describe baits in angling, especially boilies, *q.v.* Abbreviated as HNV.

high seas = the open part of a sea or ocean, usually outside territorial waters; high meaning chief or principal.

high seas resource = resources distributed exclusively on the high seas, excluding species on the continental shelf which remain under the sovereign rights of the coastal states.

high spy = a salmon fisher posted to keep watch on the movements of fish in a river (Scottish dialect). Also called spiesman.

high sticking = holding a fishing rod high to keep the line taut when drifting a nymph.

high tide = the tide at its fullest and highest extent and also the time at which this occurs in a 12-hour cycle at a particular point.

high water = 1) high tide, non-technically.

high water = 2) maximum flood stage of a stream or lake.

high water line = the intersection of mean high water with the shore.

high water mark = a reference mark on a structure indicating the maximum stage of a flood or tide.

high water neaps = neap high water (the average height of the high waters of the neap tide).

high yellow = an aquarium hobbyist term for hyperxanthic.

high-backed = a fish shape characterised by a high ratio between height and length of the body.

high-opening trawl = a bottom trawl designed to catch semi-demersal or pelagic species.

higher high water = the higher of two high waters occurring during a tidal day where the tide exhibits mixed characteristics.

higher low water = the higher of two low waters of any tidal day.

highgrading = high grading.

highly migratory species/stocks = marine species whose life cycle includes lengthy migrations, usually through the exclusive economic zone of two or more countries as well as into international waters. Tunas, marlins and swordfishes are the species usually considered under this heading.

himp = the small bit of a hair-line or gut which attaches each hook to the principal line of a fly (Shetland and Orkney dialect).

hindbrain = posterior region of the larval brain that includes the medulla, forming the rhombencephalon and all or most of the metencephalon.

hinder fin = pelvic fin (the paired fin which is located posterior, ventral or anterior to the pectoral fins (abdominal, thoracic or jugular in position). Also called ischiopterygium. It functions to steer, brake and propel the fish and acts as a keel. In the pelvic fin ray count usually all the rays are counted except a small ray preceding the first ray and usually bound so closely to it so as to require dissection to be seen. In some fishes with reduced pelvics, the spine and the first ray may be bound together by a membrane and appear as one; both are counted, e.g. in Cottidae. Abbreviated as P2 or V).

hindgut = posterior part of the gut that includes the intestine and rectal area.

hing = male salmon (*Salmo salar*) or trout (*Salmo trutta*) (English dialect).

hinge rig = a rig having built in flexible properties, usually formed by attaching traces by small rings or loops of line.

hip girdle = the skeletal support for the pelvic fins; not a favoured term in fishes.

hip waders = waterproof boots extending to the hips used by anglers and scientists when fishing. Made of latex, neoprene, Gortex, etc

hipotype = hypotype.

hirline = herling.

hirling = herling.

hirrling = herling.

histamine = a biogenic amine which can develop in the flesh, particularly of Scombridae and Clupeidae, when these are left too long in the sun. It imparts a peppery taste and serves to warn of inedibility. Histidine in fish muscle is decarboxylated by bacteria and the resulting histamine is associated with scombrotoxin poisoning. The amount of histamine in fish flesh is often regulated by law.

histo- = tissue.

histology = the study of tissues.

histophagous = feeding on animal tissues.

histotrophe = ovarian or uterine milk, a secretion produced by teleost livebearers for absorptive feeding using special structures (e.g. trophotaenia) during fish ontogeny. There is a small to moderate weight gain during embryonic development, e.g. *Ameca splendens*.

histotrophic live bearer = a reproductive guild (*q.v.*) where eggs develop into embryos and young whose partial or entire nutrition and gas exchange is supplied by the parent via histotrophes.

histotype = a type of internal tooth vascularisation (Herman *et al.*, 1994).

hit = taking of bait by a fish. Also called bite, bump and strike.

hitch = a general name for a series of knots used in angling and for tying up boats. See cleat hitch, clove hitch, double half-hitch and rolling hitch.

hitchhiker = said of a fish that seizes hold of a hooked fish as it is being reeled in.

Hitra disease = a disease of farmed Atlantic salmon among others caused by certain *Vibrio* species active at temperatures below 10°C and producing muscular and myocardial degeneration. Red or bloody streaks appear on the body and fins and can lead to fin and tail rot with, in severe cases the tail and/or fins falling off. Also called coldwater *Vibrio* and red pest.

HNV = high nutritional value.

hoa = a channel or pass connecting an atoll lagoon with the open ocean.

hoam = the dried grease of cod (Angus dialect).

hoax = some fish species are based on hoaxes, e.g. drawings of fish invented by Audubon and sent to Rafinesque. The scientific names are rejected according to the International Code of Zoological Nomenclature on the basis that they are not known to occur in nature. See also fabrication.

hoaxotype = a joke name in nomenclature for a type meant to confuse others, or a unique type constructed of several unrelated taxa.

hockle = 1) a kink in a line.

hockle = 2) to gut or clean fish (Scottish dialect). Also spelled hokl and hokkel.

hocklin = gutting fish (Shetland and Orkney dialect).

hod = a hole under a rock, a hiding place for fish (archaic).

hoddy = the uppermost breadth of a herring net (Norfolk dialect). Herring nets were usually made in four parts or widths, one width when they were in actual use being fastened above the other. The uppermost of them, connected by short ropes with a row of corks, being the hoddy.

hoder = a pole with a hook used in striking into fish (Shetland Isles dialect).

hofer pond = a breeding pond in Europe used in carp culture. Varies in depth from 30 to 80 cm and has bundles of brushwood for egg deposition. Parents are removed after spawning. Fry are netted or captured as the pond is drained. Lacks an outer trench as in the Dubisch pond.

hoffle = a stake on which salmon nets are dried (Northumberland dialect).

hog = hawg.

hog boat = a small fishing boat formerly in use at Brighton.

hog line = boats stretched across a river in a line.

hogchoker = *Trinectes maculatus* (Achiridae) a flatfish of the eastern coast of the United States south to Panama. It was once fed to hogs and the scaly and bony fish would cause some hogs to choke, hence the name. On 6 January 2010, it became the number 1 and number 8 trends on Google Trends which measures how often a search term is entered relative to total search volume. No explanation was apparent for this curious interest until the following day when it was found out to be an unanswered question on the TV show *Who Wants To Be a Millionaire?*

hogging = capturing fish by hand, often in murky waters under logs and boulders or in mud holes. See also grabbling and noodling.

hogshead = a large cask containing 1240 pounds, 238.5 litres, 17.5 bushels, 52.5-63 wine gallons, 48-54 beer or ale gallons, about 50 Imperial gallons, etc. for other commodities (varies with locality). In the U.S.A. equals 63 gallons. Also used for storing fish and salt (204 kg) for preserving fish.

Hokkaido inu = the Ainu of northern Japan taught their dogs to catch migrating salmon. Also called Ainu dogs.

hokkel = hockle (2).

hokl = hockle (2).

holaaedotypus = holaeodoeotype.

holaeodoeotype = an unofficial term in nomenclature for a preparation made from the holotype of a species. Also spelled holaeodotype and holaaedoty whole.

holaeodotype = holaeodoeotype.

holarctic = 1) the entire arctic region in oceanography.

holarctic = 2) a biogeographic region, the Holarctic, including the arctic and north temperate zones of Eurasia (the Palaearctic) and North America (the Nearctic).

holaulacorhizid = vascularisation of a tooth root through many small foramina concentrated in a median groove running from the outer to the inner face, e.g. in Rajidae (Herman *et al.*, 1994).

hold = 1) an enclosed space on a vessel for storing fish; may be insulated and/or refrigerated.

hold = 2) fish remaining in one place, usually in a current.

hold = 3) a place fish hide, as a lurking place in a stream under rocks.

holdall = an elongate bag designed to hold fishing rods, banksticks, etc.

holdfast = 1) small hooks on the anal fin of male tetras (*Hyphessobrycon*, Characidae) thought to be used during mating to help grasp the female.

holdfast = 2) structures, e.g. tendrils, on the egg cases of Chondrichthyes that anchor them to the sea bed.

holding area = a specific part of a water body to which fish are attracted because of the food available or the cover.

holding back = in angling, trotting a float at a slower speed than the surface current so that the bait travels at the same or a slower speed than the current at the bottom.

holding pen = a large plastic tank used for fish grown in aquaculture.

holding pond = a pond where brood fish are kept, usually less than 0.5 ha.

holding station = a lake area where inactive fish spend most of their time.

hole = 1) a deep place in a body of water, often a refuge for fish.

hole = 2) a favoured spot on a lake or in a river for fishing.

hole = 3) a hole cut through the ice of a river or lake for fishing.

hole-in-head disease = 1) head and lateral line erosion (a nutritional deficiency seen in aquarium fish, usually of vitamin C, aggravated by stress and poor water quality. Holes develop in the head and sometimes along the lateral line. Death may result. Also called lateral line disease).

hole-in-head disease = 2) enteric septicaemia (a disease caused by the bacterium *Edwardsiella ictaluri* affecting fingerling and yearling catfish. Characterised by a raised or open ulcer on the frontal bone, hence the alternate name of hole-in-head disease).

hole-in-the-head disease = hole-in-head disease.

holeuryhaline = pertaining to organisms inhabiting fresh, brackish or marine waters.

holibutter = a vessel engaged in the halibut fishery. Also spelled halibutter.

hollow kenching = improper kenching (*q.v.*) when hollows are left from which pickle (*q.v.*) will not properly drain, resulting in sour fish.

holo- (prefix) = complete, whole, entire, total.

holo-eurytropical = occurring in tropical and subtropical waters.

holoblastic = an egg, the whole of which undergoes cleavage, usually those with little yolk, e.g. Amphioxo, Petromyzontiformes, Acipenseridae, Amiidae, Lepisosteidae.

holobranch = the two vertical rows of gill filaments that comprise a whole gill; the two hemibranchs of a gill.

Holocene = a geological epoch within the Quaternary Period ca. 10,000 years BP to the present day. Also called Recent.

holoepipelagic = permanently inhabiting the epipelagic zone.

holoeuryhaline = organisms that inhabit fresh, brackish and salt waters.

holohomoiotype = a homoeotype of the same sex.

holohomotype = holohomoiotype.

hololectotype = lectotype (one of several syntypes (*q.v.*) designated after the publication of a species-group name, as the type-specimen of the taxon bearing that name. Designated only where there was no original holotype).

holomictic = said of a lake having complete circulation at the time of winter cooling.

holoneotype = neotype (a single specimen designated as the type-specimen of a nominal species-group taxon of which the holotype (or lectotype), and all the paratypes, or all syntypes are lost or destroyed or suppressed by the International Commission on Zoological Nomenclature).

holoparalectotype = a paralectotype (any one of the original syntypes remaining after the selection of a lectotype), belonging to the same sex as the lectotype.

holoparatype = a paratype of the same sex as the holotype. Paratype is the preferred usage.

holopelagic = organisms that remain pelagic throughout life or live in surface layers over both neritic and oceanic waters indifferently.

holoplastotype = the cast of a holotype.

holoplesiomorph = a plesiomorph, *q.v.*, of the same sex as the holotype. Plesiomorph is the preferred usage.

holospondylous = said of a vertebra with a single-disk centrum, formed of a single bone with all elements (arches, spines) fused, e.g. *Dipterus*, *Scaumenacia* (Dipnoi), Teleostei.

holospondyly = the condition of holospondylous vertebrae.

holostyly = the type of jaw suspension where the upper jaw is fused with the cranium, e.g. Holocephali, Dipneusti.

holosubantarctic = species living between the subtropical convergence and the Antarctic convergence.

holotype = the single specimen designated or indicated as "the type-specimen" of a nominal species-group taxon (species or subspecies) by the author at the time of the original publication (or the single specimen when no type was specified but only one specimen was present for the description). If there are no other types (paratypes) then the holotype is termed "unique". If the holotype is lost or destroyed, a single specimen chosen ideally from the paratypes, is designated as the neotype (replacement holotype). If a species is split into two or more species, the name is retained by the species represented by the holotype, and a new holotype will have to be designated for each new species.

holt = hover (2).

holy butt = the origin of halibut, butt being an old word for any flattened fish. Holy butt were eaten on church holy days.

holy fish = 1) halibut; see holy butt.

holy fish = 2) sacred fish (1) various pools, wells and streams, particularly in the Middle East, contain fish that are purportedly sacred. There is a Pool of Sacred Fish (*q.v.*) at Şanlıurfa in southeastern Turkey. The temples of Apollo and Aphrodite in ancient Greece had sacred fish).

O see sacred fish.

holy mackerel = an expression of surprise. Perhaps a euphemism for holy Michael or holy Mary. May be derived from mackerel snappers, derisory to Catholics who ate fish on Fridays.

Holy Mackerel = a brass casting in the central chandelier of the Senate Chamber of Massachusetts. A less famous fish than the Sacred Cod of Massachusetts (*q.v.*).

home = the place selected for the production and rearing of the young, the nursery of the species, and/or for resting.

home range = the area over which an animal normally travels in its day to day activities.

homeo- (prefix) = alike, similar, entire.

homeosmotic = organisms which maintain body fluids at a rather constant osmotic pressure despite changes in their environment, the condition in most fishes. Opposite of poikilosmotic.

homeostasis = the ability of organisms to maintain body fluids at a rather constant osmotic pressure despite changes in their environment, the condition in most fishes. Opposite of poikilosmosis.

homeostatic = adjective for homeostasis.

homeotherm = homiotherm.

homeotype = homoeotype.

homing = the return to a place formerly occupied instead of to other equally probable places, e.g. a return to spawning grounds.

homing rate = the proportion of successfully returned spawners that return to spawn in the same population in which their parents spawned.

homo- (prefix) = similar, the same, common, alike.

homocercal = type of tail fin in which the vertebrae generally turn upward at the hind end of the column, but which is externally symmetrical. The fin rays of the caudal are supported by hypaxial elements. Found in most Teleostei.

homodont = type of dentition where the teeth are all similar, indicative of a uniform diet.

homodonty = the condition of having homodont teeth.

homoeotherm = homiotherm.

homoeotype = a specimen compared with the type by an author other than the author of the species and determined as conspecific.

homogenised condensed fish = liquid from whole fish or offal with about 50% moisture prepared as an alternative to fish meal.

homogenous = uniform; used to describe egg yolk in larval fishes as opposed to segmented.

homiotherm = organisms maintaining a constant internal temperature, usually above that of their environment. Some oceanic fishes attain temperatures above their surroundings due to muscular activity, control of a surficial vascular network and a small ratio of surface to volume, e.g. *Thunnus*. Also spelled homeotherm.

homoiotype = homotype.

homolecithal = eggs with a small quantity of yolk which is evenly distributed. Also called isolecithal.

homologous = the adjective from homology.

homology = similarity of characters due to close ancestry, a common evolutionary origin, e.g. pectoral fins are homologous with human arms but pelvic fins are not homologous with legs (and so are perhaps better termed ventral fins). In contrast to homoplasy and equivalent to synapomorphy since derived from the same ancestral character.

homonym = one of two or more identical names denoting different species-group taxa (species or subspecies) within the same nominal genus, or different taxa within the genus-group (genus or subgenus), or family-group (superfamily, family or subfamily). Senior homonyms and junior homonyms are, respectively, the earlier and later published of two homonyms. Primary homonyms are the two or more identical species-group names applied to different taxa in the same nominal genus when first published. If identical species names are erected in identically named but taxonomically distinct genera, the species-group names are not homonyms because the genera are different although homonymous. Secondary homonyms are the two or more species-group names applied to different taxa of the group and included in the same nominal genus as the result of the transfer of one or more of the species-group taxa from another genus.

homonym citation = authorship for two or more homonyms may be cited using '*non*' and/or '*nec*' as follows:- A.... Smith 1947 *non* Jones 1958 *nec* Brown 1960.

Homonymy, Law of (Principle of) = any name that is a junior homonym of an available name must be rejected and replaced. The principle that the name of each taxon must be unique.

homoplastic = adjective from homology.

homoplasy = similarity due to convergent, parallel or reversed (i.e. loss) evolution, i.e. independent evolutionary change, not common ancestry. Convergent features are derived from distantly related ancestors, i.e. independent evolution derived by a different mechanism, thus leading to superficial similarity. Parallelisms derive from closely-related ancestors, i.e. independent evolution using the same mechanism.

homopterygia = plural of homopterygium.

homopterygium (plural homopterygia) = pectoral fin (the paired fin born by the pectoral girdle, usually just behind the gill opening or slightly dorsal or ventral to this position. Also called omopterygium or homopterygium. This fin is generally larger than the pelvic fin and less variable in position and structure. The pectoral is low on the body in more primitive bony fishes and higher in more advanced ones. It functions to steer, brake and propel the fish. Pectoral fin ray counts include all the rays branched and unbranched. The length is measured from the origin (upper or outer part of base) to the distal tip of the fin. Abbreviated as P or P1).

homotherm = homoiotherm.

homotopotype = a homoeotype, *q.v.*, from the type locality.

homotype = homoeotype.

homotypic school = a well-defined group composed of one species with individuals of similar size, cf. heterotypic school.

homotypic synonym = a synonym based on the same nomenclatural type.

honey hole = an area containing big or many fish (American slang).

honeycombing = pitted, spongy-looking tuna flesh usually near the head of the fish appearing on cooking flesh that has started to decompose.

hoodik = hoder.

hook = 1) a bent piece of wire with its tip sharpened and often a barb below the tip, used to catch fish. Available in many sizes and styles, variously numbered and named. May be single, double or treble but all these are counted as one hook in angling regulations. Hooks separated by stretches of line are counted as multiple hooks. Bronze hooks are favoured for live bait fishing as swallowed hooks will dissolve in digestive juices if they cannot be removed without harming the fish. A hook comprises an eye (a circular bend at one end for line attachment), a shank (the long straight part, may be long- or short-shanked, depending on types of bait used, rounded (regular) or flattened (forded)), a bend or shape (the curved part), the spear, spearhead or point (the straight part after the bend), the point (the end of the hook) and a barb behind the point. The distance between the point and the shank is the gape or gap and the distance between the lowest part of the bend and the gape is the throat or bite. There are various forms of the eye of a hook, the ball or ring eye being the most common. Others include tapered, needle, hole, brazed, looped, loose, open straight, open cut, open bent aside and koohto. The eye itself may be straight (in line with the shank), turned down or turned up. Some hooks do not have an eye but a flattened end to which line must be whipped or snelled rather than tied. Flattened ends come in various patterns such as straight, marked, tapered, marked tapered, spaded and knobbed. Each hook pattern has a normal shank length, varying between patterns, and many patterns come in a variety of shank lengths. While most shanks are straight, they can be bent in various ways. Bent patterns include bent back, bent down, tipped back, bent aside, curved, kinked, stepped, crimped popper, Swedish dry fly, flybody, sedge and flat-body nymph, all variously directed to penetrate efficiently or to hold particular baits. A humped shank is to prevent cork, plastic, wood or rubber bodies from turning around on the shank, a sliced shank has barbs to attach a worm, egg or other bait, a curved down one is made to bring the line of pull closer to the line of point penetration and a central draught shank is bent upward for a quick and raking penetration. Names of gapes and bites include English Bait, Aberdeen, Siwash, Trout Italien, Pike and Wide Bend. The pike has a very wide gape, for example, to hold a large bait, hook a long-snouted fish and in setting the point behind a long jawbone. The point comes in various forms, such as spear, hollow, rolled, Dublin, knife, barbless needle, barbless humped and harpoon. The bend can be kirbed (offset to the right when viewed from the top of the hook with the eye towards the observer), straight or reversed (opposite of kirbed, bent to the left), the shank can be in various lengths and cross sections, and the diameter of the wire the hook is made of can vary significantly. The hook's pattern is usually based on the shape of the bend and named types include Carlisle, O'Shaughnessy, Eagle Claw, Beak, Kirby, Model Perfect, Aberdeen, Siwash, Limerick, Sproat, Sea Mate and Albacore. Eyes may be ball (a circle perpendicular to the plane of the hook; closed, tempered and strong or open and not as strong or expensive), tapered (the eye and shank nearby are tapered to make

the hook lighter for dry fly-fishing), looped (the eye runs back along the shank and may be tapered; found in salmon wet flies), needle (shaped like a needle eye, easily used with a natural bait), brazed (the eye gap is brazed to the shank ensuring the leader will not be cut and for strength; found in big-game hooks), or flattened (the shank is pierced, used for medium-sized species in commercial fishing). Eye positions may be ringed (parallel to the shank, used with lures in tandem), turned up (gives more clearance between the shank and point for fully dressed flies) or turned down (closer to the line of penetration). Types of points include needle (best penetration but easily blunted), hollow (rounded out between barb and tip for fast penetration), spear (more easily made than the preceding, varies types and not as penetrating as the preceding), barbless, arrow (does not penetrate easily, rarely used), and knife-edge (very sharp with all four sides ground, flattened and difficult for a big-game fish to throw). The point position may be straight (parallel to the shank), rolled or rolled-in (bent in towards the shank), bent-in (whole spear bent in towards the shank giving a small bite but difficult for the fish to eject), and bent-out (bent out away from shank for quick penetration). The various types and shapes of hooks can be seen in angling books and sales catalogues.

hook = 2) a spit or narrow cape turned landward at the outer end thus forming a hook shape.

hook gap = the distance from the shank to the point of a hook. This gap often determines the type of bait that can be used.

hook guard = plastic covers for hooks, especially treble hooks, so they can be carried safely.

hook, line and sinker = to swallow a fantastic story. See also swallow a gudgeon.

hook set = setting the hook, the methods by which a hook is embedded in the fish mouth and kept there.

hook silver = legal tender, hook-shaped silver pieces used in Ceylon in the early nineteenth century.

hook size = size is determined by the gap or gape between the shank and point; the lower the number the larger the hook, e.g. a size 24 hook has a gap of 2 mm while a size 2 has a gap of 10 mm. After size 1 the numbering system becomes 1/0, 2/0, 3/0 as size increases. There is a great deal of variation in hook size with pattern and manufacturer and other numbering systems may be encountered. Using the correct hook size for the bait and the fish sought after can be critical in successful angling.

hook snell = a knot used by anglers to attach a line to a hook through its eye; can only be used with a free length of line as both ends pass through the eye. Various websites have animated steps showing how to tie this knot.

hook snood = a high strength knot used by anglers to attach trace line to a hook. Various websites have animated steps showing how to tie this knot.

hook tyer = a device used by anglers to help snell, *q.v.*, hooks; or to tie line to small spade-end hooks.

hook-and-line = a hook on the end of a line with a natural or artificial bait. Also applies to hooks used to catch fish by snagging or jigging. Hook-and-line units may be used singly or in large numbers.

hook-fish = fish caught on a hook.

hook-maker = artisan who made fish hooks for use in the cod fishery of Newfoundland.

hook-set = device for bending fish-hooks into proper shape.

hook-to-nylon = a spade-end hook sold already tied to a hooklength and with a loop at the other end for attachment to the main line.

hooked = over-reached, tricked, caught, being a simile taken from fishing and the slang fish hooks meaning fingers.

hooker = 1) angler.

hooker = 2) a one-masted fishing smack (English dialect).

hooking = fishing for cod with hand lines.

hooking-boat = a small, single-masted, fishing vessel (Newfoundland).

hooklength = the line directly attached to a hook (Britain). Usually of lower breaking strain than the main line so that the fish will not break off a long length of line and become entangled. Called snell in North America.

hooklet = a small hook, e.g. sexual hooklets in Characidae.

hookset = setting the hook, the methods by which a hook is embedded in the fish mouth and kept there.

hoop = dan leno hoop (a hoop-shaped dan leno made of bent wood with short rigging ropes wired to the outer circumference. Also called dan leno ring, geer, hoop bridle, round dan leno and yoke hoop).

hoop bridle = dan leno hoop (a hoop-shaped dan leno made of bent wood with short rigging ropes wired to the outer circumference. Also called dan leno ring, geer, hoop, round dan leno and yoke hoop).

hoop net = a fyke net mounted on hoops which help support the netting.

hootchie = a plastic or rubber lure made to imitate a squid. Used on the west coast of North America.

Hootie and the Blowfish = an American pop-rock band. Blowfish was the nickname of a friend of band member Darius Rucker, who had chubby cheeks.

horizontal classification = a grouping of species from a similar time interval of evolution rather than those sharing a common lineage (horizontal with respect to a phylogenetic tree). Compare vertical classification.

horizontal distribution = the location of fish in the cross section of a river or a lake.

horizontal frame line = the lines inserted through the lumen of the framed gill net meshes at regular intervals to make horizontal sections in a frame net.

horizontal incubator = a box-shaped structure used for hatching large fish eggs in a horizontal water flow, e.g. used for salmonids.

horizontal integration = a fishery where firms in the fishery operate and manage multiple units at the same level of the supply chain, e.g. a firm that operates several processing plants, across several regions or for different species.

horizontal septum = 1) a sheet of connective tissue separating the epaxial and hypaxial muscle masses. Also called horizontal myoseptum.

horizontal septum = 2) the lateral midline when referring to pigmentation in larval fishes.

horizontal tow = pulling a net at a set depth and for a set time.

horizontal transmission = disease transmission from individual fish to individual fish by contact or through the environment, cf. vertical transmission.

horn = 1) a bony projection, e.g. on the head of Ostraciidae.

horn = 2) a ring made from a section through a cow's horn, forming the apex of a capelin net (Newfoundland).

horned pike = a pike (*Esox lucius*) bearing horns or spines on the head. These are backward pointing extensions of the frontal bones, an anomaly and rare occurrence that attracts some interest from anglers.

horny capsule = an egg case as in the Rajidae.

horny teeth = keratinous, conical teeth derived from the epidermis in Petromyzontidae.

horse = 1) to force a fish in too shore too quickly when angling.

horse = 2) a frame, usually on four legs, used for supporting or holding, e.g. in carrying fish, as in a herring horse.

horse = 3) a platform of stones or boards on which split and salted cod are placed in layers after washing in order to drain during the curing process (Newfoundland).

horse = 4) the pile of fish placed on a horse (3).

horse = 5) to horse (3) cod.

horse fishing = 1) the use of a pair of horses to pull a seine through shallow water on a beach to catch shrimp and small fishes.

horse fishing = 2) the use of horses in shallow water to scare fish towards nets.

horse haul = a small catch of fish (Newfoundland).

horse net = using a horse to drag a seine through the shallows in the sea.

hose = to seize bait greedily (Scottish dialect).

hose net = a small net affixed to a pole and used for rivulet fishing (archaic).

hospital tank = quarantine tank (an aquarium set aside from the main aquaria and used to isolate sick fish for treatment or new fish that need to be checked for parasites and diseases).

hossack = a knot tied in a broken fishing line to strengthen it (Scottish dialect).

host = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for angelfish.

host fish = a fish that is the accidental, abnormal, final, intermediate, natural, paratenic, primary, reservoir, secondary, transport and typical (all *q.v.*) host or environment for a parasite, e.g. a wide variety of crustaceans and nematodes, glochidia of mussels.

host species = the species which provides the sperm which activates the development of the egg in the sexually parasitic forms or combines with the chromosomes of the sexually parasitic hybridogenetic forms.

hot marinated = fish flesh marinated in hot vinegar or acidified brine at 80-90°C. Packed in jelly or sauces.

hot smoked = a process whereby the flesh of the fish is cooked (at up to 120°C) during smoking over 12-18 hours; hot smoked fish can be eaten without further cooking, *cf.* cold smoked. The flavour is intensely smoky and the fish is dry.

hot-spot = in angling, any area where fish concentrate and can be readily caught. See also hotspot.

hot spring = a spring bringing hot water to the surface; defined as having water temperatures 8C° or more above mean air temperature.

hot-shotting = fishing a wobbling plug directly downstream from a boat or wading angler.

hotspot = an area rich in species (often with many endemics) but environmentally threatened. See also hot-spot and biodiversity hot spot.

house = 1) fish house (a building where fish are stored or processed).

house = 2) a restaurant serving or specialising in fish and seafood.

house = 3) a merchant firm engaged in the Newfoundland fish trade, purchasing and exporting salt cod, and financing fishing operations through the advance of supplies and credit.

house bankin' = Dutch mess (salt cod and potatoes with browned onions. Garnished with scrunchions (the crunchy bits remaining after pork fat is rendered). Also called fish and scrunchions or hugger-in-buff).

house standard = the quality of dried and salted cod specified by a merchant as the basis for payment to a fisherman (Newfoundland).

hover = 1) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for trout.

hover = 2) a hiding place for fish such as a rock or overhanging bank (English dialect). See also holt.

hoyd = a fishing lodge (Shetland Isles dialect).

how pond = fish pond (obsolete).

HSI = hepatosomatic index (liver weight as a percentage of the whole body weight (Htun-Han, 1978)).

hubba = a cry given to warn fishermen of the approach of pilchards (Cornish dialect). See also heva.

hudik = a gaff or fish spear, a Scottish dialect taboo-name, with variant spellings.

huer = formerly a sentry on a high cliff, pointing out pilchard schools (reputedly by waving a small bush) in Cornwall to seine netters. See also herring caller, balker, conder.

hugger-in-buff = Dutch mess (salt cod and potatoes with browned onions. Garnished with scrunchions (the crunchy bits remaining after pork fat is rendered). Also called house bankin' or fish and scrunchions).

huggie staff = a wooden pole terminating in a strong iron hook, used for striking fish into a boat; a gaff.

huid = a knot used to join two parts of a fishing line (Scottish dialect).

huif = a gaff (Scottish dialect).

hula grub = a soft, plastic curly-tiled grub with a soft skirt at the head of the grub.

hull = to drive a trout into its hole (English dialect).

hum = the milt of cod, used as delicacy (Angus dialect).

human = a space suit for a fish.

humeral = pertaining to the "shoulder" area of a fish just behind the head.

humeral hiatus = pseudotympanum (a translucent, triangular area in the humeral region on the side behind the gill cover where the muscles are missing and the anterior part of the gas bladder is directly in contact with the skin, which is hypothesised to improve the hearing in many very young characoids and persists in some adults, notably the Cheirodontidae).

humeral process = a projection of the cleithrum usually just above the base of the pectoral fin.

humeral "scale" = a large, usually dark, scale-like projection of the postcleithrum above the base of the pectoral fin and just behind the opercle, e.g. in Etheostomatinae (Percidae).

humeral scale = 1) a hypertrophied black-tipped scale found on the body above the midline about a head length behind the head in mature male *Pterobrycon* (Characidae, Glandulocaudinae), probably a recognition signal.

humeral scale = 2) a modified scale with a pointed tip above the pectoral and pelvic fins of Clupeidae and Engraulidae.

humeral spot = humeral "scale".

humic lake = a lake rich in organic matter in the form of suspended plant colloids and plant fragments but low in nutrients.

hump = 1) any area higher than the surrounding area in reference to lake bottom features.

hump = 2) the raised area behind the head in certain fish species, usually mature adults or breeding males.

humuhumu-nukunuku-a-pua'a = the blackbar or Picasso triggerfish (*Rhinecanthus aculeatus*), the unofficial state fish of Hawaii, one the longest common names for an animal. The name is often jokingly said to be longer than the fish. Its meaning is "fish with a snout like a pig" from its appearance or "fish who comes out of the water and sounds like a pig" from the snort it makes when removed from the water. It puffs up with air to wedge itself among rocks as a defensive measure.

hundi = a traditional vessel used in India to transport fry or fingerlings. Originally an earthen pot, now often of aluminium.

hundred = a measure of quantity; for fish the exact number in a hundred varied with the species. A hundred herring was 128 fish and a hundred mackerel was 132 fish. A long hundred was 120 fish. See also warp and tally.

hundredweight = 50.802 kg (long), 45.359 kg (short). Abbreviated as cwt, long and cwt, short respectively.

hunger the hook = to spare the bait.

hungry schooner = a Newfoundland vessel returning to port without a catch of fish or with few fish.

Hunter's organ = a long thin ventral electric organ below the main electric organ in *Electrophorus*.

huratoxin = a plant piscicide based on the latex of *Hura crepitans* (Euphorbiaceae), used in South America. Other piscicidal plant chemicals include callicarpone, ichthyothereol, inophyllolide, juglone, justicidin, maingayic acid, rotenone, and vibsanine, all q.v.

hurdy-gurdy = an apparatus turned by a crank, e.g. in fisheries used to haul in a trawl or longline. Also called gurdy.

husbandry = the scientific management and control of the hatchery environment for the production of fish; may include the breeding, feeding and health care of the fish.

huselack = a small stone hut used for drying fish or storing fishing gear (Shetland Isles dialect).

hut = fish hut (a small, moveable shack placed over a hole in the ice in winter to protect the fisher from the elements. May be heated and have other facilities).

hutch = a box trap for catching fish such as salmon and eels (English dialect).

huvie = 1) a large straw basket used for carrying trout and other fish (Scottish dialect).

huvie = 2) a basket-work fish trap used in a trout streams (Scottish dialect).

huvie = 3) a small basket scoop with a wooden handle used for landing fish (Scottish dialect).

hyaline = clear, glassy, vitreous, semi-transparent.

hyaline cartilage = cartilage with a clear, translucent matrix.

hyaline zone = a zone on an otolith that allows more light to pass than an opaque zone. Also called translucent zone, the preferred term.

hyalodentine = a bony material of calcium salts. Found deposited on the fibrillary plate of teleost scales.

hybodont = a form of early (Devonian to Mesozoic) shark tooth, characteristically elongate, low in profile, with sinuous ridges and pierced by numerous nutrient canals. Named for the genus, *Hybodus*. See also cladodont, diplodont and symmorid.

hybrid = the offspring of the crossing of two different taxa (most commonly two different species). Hybrids commonly have reduced fertility, increased size and are intermediate between the parent forms. Hybrids are designated by the names of the parents separated by an

"x". The parental names are arranged in alphabetical order, e.g. *Ptychocheilus oregonense* x *Richardsonius balteatus*.

hybrid formula = the names of the parent taxa of a hybrid with an "x" between them.

hybrid name = names of progeny of two individuals belonging to different taxa, names given to hybrids are not normally available (*q.v.*), as they are individuals, not populations, and hence not taxa.

hybrid purse seine = one designed to catch tuna where porpoise are also expected (and must be released) as opposed to a net for tuna only.

hybrid vigour = the occurrence where hybrid offspring perform better than the parents. Also called heterosis.

hybrid swarm = an interbreeding population formed from hybridisation of two species.

hybridogenesis = the consistent production of only female offspring where sperm from a male of a bisexual species contributes parental chromosomes to the diploid hybrid progeny, which itself transmits only the maternal chromosomes to the eggs of its progeny, the paternal chromosomes being lost at meiosis, e.g. *Poeciliopsis monacha-lucida*, *P. monacha-occidentalis*. See also gynogenesis.

hydric = wet; characterized by, relating to, or requiring an abundance of moisture.

Hydro = in Canada, confusingly refers to electricity produced by hydropower from dams on rivers (your Hydro bill is for electricity not water).

hydro- (prefix) = water.

hydrobiology = the study of life in aquatic habitats.

hydrocephaly = an increased volume of cerebro-spinal fluid in the head occurring in some larval and juvenile hatchery fishes.

hydrocolous = living in an aquatic habitat.

hydrogarum = garum (*q.v.*) mixed with water.

hydrogen ion concentration = pH (a measure of how acidic or alkaline a solution is, i.e. the concentration of hydrogen ions in a solution (log to base 10 of the reciprocal of the hydrogen ion concentration). pH 7.0 is neutral, lower values are acidic and higher values are alkaline. Acid rain decreases the natural pH of rivers and lakes. Some fish require a specific pH, others will live at wide range of values: the general range for fish is 6-9. The internal pH of a fish falls after death but rises as amines are formed during spoilage).

hydrograph = chart of water levels over time.

hydrography = 1) the measurement of the physical features of fresh and marine water bodies.

hydrography = 2) the description and study of rivers, lakes, seas and other waters.

hydrohaline = water with an ocean-derived salt content greater than 40 p.p.t.

hydrology = the study of water, its distribution, circulation, properties and effects, on the surface, subsurface and in the atmosphere.

hydrolysate = ground up carcasses (guts, bones, scales, cartilage, etc.) after the flesh has been removed for human consumption.

hydroperiod = the cycle of rise and fall in water levels, e.g. the period of flooding in a stream.

hydrophone = an underwater microphone.

hydropic = the adjective for hydrops.

hydrops = a fish disease evidenced by liquid accumulating in the belly. Also called dropsy.

hydrosaline = water with a land-derived salt content greater than 40 p.p.t. Also called hypersaline.

hydrosinus = a dorsal recess of the oral cavity in Petromyzontiformes involved in the pumping action of the sucker. Compression of the hydrosinus causes expulsion of water from the pharyngeal cavity into the branchial tube.

hydrosphere = the waters on the Earth in the atmosphere, oceans, fresh waters, glaciers and snowfields and groundwater.

hydrothermal vent = an ocean bed site where hot, sulphur-rich water vents from a geothermal source; with a unique fauna including associated fishes. Also called black smoker when a cloud of dark particles is emitted and white smoker when particles are pale.

hydrotroph = a uterine "milk" secreted by the trophonemata (villi-like structures) in Rajiformes.

hygiene = the processes that make sure food fish are safe for human consumption.

hyobranchium = the lower section of the hyoid arch together with the branchial arches.

hyodont = said of teeth not ankylosed to the jaw.

hyoid = the epi-, cerato- and hypohyal (see hyoid arch).

hyoid arch = the arch lying between the gill arches and jaws, with which it is believed homologous and which helps support the floor of the mouth cavity. Composed in teleostomes of the following paired endoskeleton elements: hyomandibula, symplectic, interhyal, ceratohyal and one or two hypohyals which articulate with the basihyal. The prefixes epi-, cerato- and hypo- should not be interpreted as indicating correspondence with branchial elements bearing the same prefix. Posterohyal (epihyal), anterohyal (ceratohyal), dorosohyal (dorsal hypohyal) and ventrohyal (ventral hypohyal) have been coined to avoid this confusion. Some authors

eschew the term epihyal and employ for the epihyal and ceratohyal, posterior and anterior or proximal and distal ceratohyal.

hyoid barbel = a barbel which hangs down from the hyoid region of the throat in members of the anglerfish family Linophrynidae and the beardfish family Polymixiidae.

hyoid teeth = misnomer in fishes for the basibranchial or hypobranchial teeth.

hyomandibula = the upper paired deep bone or cartilage of the hyoid region, sometimes taking part in jaw suspension and which supports the opercle. Dorsally it articulates with the otic capsule at the hyomandibular fossa, ventrally with the quadrate and symplectic. In most Teleostei it has a foramen for the hyomandibular branch of the facial nerve (VII). Often spelled hyomandibular.

hyomandibular = hyomandibula, strictly the adjective.

hyomandibular canal = preoperculo-mandibular canal (the cephalic lateral line canal extending along the preoperculum and lower jaw. The preopercular and mandibular parts of the canal may be disconnected. Abbreviated as PM).

hyostylic = suspension of the jaw in which the upper jaw loses any major direct connection with the cranium and the upper and lower jaws are supported solely by the hyomandibula, e.g. in Elasmobranchii and Teleostomes.

hyosymplectic cartilage = the fused symplectic and hyomandibular, a dorsal cartilaginous structure of the hyoid arch in adults of some fishes.

hypalmyroplankton = brackish-water plankton.

hypapophysis = a ventral keel or spine on a vertebra.

hypaxial = any structure morphologically ventral to the chordal axis; a muscle on the lower side of the body below the horizontal septum; a bone supporting the caudal fin below the urostyle.

hypaxonal = hypaxial.

hyper- (prefix) = above, exceeding, higher, more than, abnormally increased.

hyperaggregation = catchability-led stock collapse (the tendency for small schools of fish to aggregate into larger schools, resulting in a continued high fishing pressure although the total stock has declined).

hyperbenthic = living above but close to the bottom.

hyperbolic tank = an oval tank with a hyperbolic bottom used in culturing fish larvae as the shape aids dispersal of larvae and food.

hypercalcification = development of very densely calcified cartilage during growth in sharks. This growth may distort and engulf existing cartilage, e.g. the rostrum of *Lamna ditropis*, the salmon shark.

hypercoracoid = coracoid (the lower endochondral bone on which the pterygials or actinosts of the pectoral fin rest. Dorsally it has a notch which, with a similar ventral notch on the scapular, frames the scapular foramen).

hyperdepletion = an exaggerated trend index, a stock seeming to have declined more than it really has because of faulty analyses of catch data (Walters, 2003).

hyperdominant = in an aquarium, the individual fish, of either sex or any species, which dominates the others.

hypereutrophic = a lake with excessive nutrient concentrations and thus high productivity.

hyperhaline = water with a salinity greater than 40 p.p.t. from ocean-based salts.

hypermelanosis = excess of dark pigmentation, e.g. on the blind side of some individual flatfishes, cf. hypomelanosis. Also called ambicolouration.

hyperosmotic = freshwater fish which regulate the ionic concentration of blood and body fluids above that of water.

hyperosmotic infiltration = a mass vaccination system used on fishes. Short baths are given in a hypertonic solution of sodium chloride thus enhancing the entrance of an antigen via the lateral line and possibly the skin and gills.

hyperossify = the process of massive bone growth seen in some fishes.

hyperostosis = excessive or abnormal thickening of bone. This is really a relative term as strongly developed and thickened bones occur in fishes naturally and contrast with the usual thinner bones, e.g. in the cranium of grunts (Haemulidae) and croakers (Sciaenidae) which lack suture lines and are very solid, unlike most fish skulls with sutures and discrete bones. Also called Tilly bones, q.v.

hyperphagy = heightened feeding activity, intensive biting or intensive feeding.

hyperpharyngeal groove = the longitudinal ciliated groove on the upper wall of the pharynx which sweeps food particles to the oesophagus in Amphioxus and in the ammocoetes stage of Petromyzontiformes.

hypersaline = salinity well in excess of that of sea water; found in enclosed water bodies, derived from land salts.

hypertonic = having an osmotic pressure higher than that of the environment, e.g. a fish in fresh water is hypertonic to its environment (and hence tends to lose salts and be flooded by water). Opposite to hypotonic.

hypertrophy = 1) the over-development of a structure, e.g. the lips in some cyprinid fishes, the finfolds in the larval myctophid *Loweina rara* used in nutrient absorption.

hypertrophy = 2) waters of very high nutrient content.

hyperxanthic = having abnormal amounts of xanthin, a yellow pigment.

hypethmoid = ethmoid (the deep, embryonic, perichondral, cartilaginous bone ossifying in and around the nasal septum. Later covered by the nasals, prevomer, adnasals (and rostrals) and located anterior to the orbit. It may not ossify in some Teleostei. Also called dermethylmoid).

hypo- (prefix) = under, below, beneath, lower than, less than, small size, deficiency.

hypo-osmotic = marine fish which regulate the ionic concentration of blood and body fluids below the concentration of sea water.

hypobatic = said of a caudal fin with a longer lower lobe.

hypobenthile = abyssal (referring to water below 4000 metres or 2000 fathoms (= 3660 metres), down to 6000 metres, where light does not penetrate. Occasionally used for depths below 2000 metres. A constant environment with temperatures usually 0-2°C or temperatures are uniform).

hypobenthos = sea floor fauna below 1000 metres.

hypoblast = the inner of two layers of the blastoderm that forms during gastrulation and gives rise to the mesoderm and endoderm.

hypobranchial = one of a series of deep, paired endochondral bones on the lower part of the gill arch between the ceratobranchials and the basibranchials. May occur on arches 1, 2, 3, 4 and bear dentigerous plates. Salmonidae have only 3 pairs. In Chondrichthyes they are the most ventral paired cartilages.

hypobranchial teeth = teeth on the hypobranchial bones; sometimes incorrectly called hyoid teeth.

hypocercal = type of tail fin where the lower lobe is the longer and is supported by the vertebral column. Asymmetrical externally as well as internally, e.g. *Pteraspides* (fossil). See also heterocercal.

hypochord = a transitional rod of cells which develops under the notochord in the trunk region of some embryos.

hypochordal = below the notochord, in reference to the lower lobe of the caudal fin.

hypocoracoid = coracoid (the lower endochondral bone on which the pterygials or actinosts of the pectoral fin rest. Dorsally it has a notch which, with a similar ventral notch on the scapular, frames the scapular foramen).

hypodigm = all the material of a species available to a taxonomist and, more narrowly, all the material used by the taxonomist to circumscribe the taxon.

hypogean = the subterranean environment inhabited by "cave" fishes.

hypognathous = 1) prognathous (having jaws that project forward markedly).

hypognathous = 2) having a projecting lower jaw.

hypohyal = the one or two deep, endochondral bones in the hyoid arch between the ceratohyal and the glossohyal. Articulates dorsally with the ceratohyal and ventrally with the basihyal. *Lepisosteus* has only one while *Gadus* has two, the dorsal hypohyal or dorsohyal and the ventral hypohyal or ventrohyal.

hypolimnion = the cold lower layer of a stratified lake, under the epilimnion and beginning just below the thermocline. This layer is not directly affected by surface events.

hypomaxilla = a small, paired, tooth-bearing bone found behind the premaxilla and below the maxilla in some Clupeidae.

hypomelanosis = lack of dark pigmentation, e.g. on the eyed side of some individual flatfishes, cf. hypermelanosis. Also called pseudo-albinism.

hypomeralia = those muscle bones or epipleurals which are attached to the ventral ribs or haemal arches.

hypomorphonym = the name of an infraspecific taxon.

hyponym = a name rejected in the absence of a type.

hypoparatype = an unofficial term in nomenclature for a specimen used in preparing the description of a taxon but not one designated as a paratype.

hypopharyngeal groove = a median groove on the floor of the pharynx of larval lampreys. Also called endostyle.

hypophyization = injection of pituitary extract from cyprinids or salmonids into a fish to induce production of eggs or sperm.

hypoplastotype = an unofficial term in nomenclature for an artificial model of a secondary type.

hypopyle = the posterior opening of the tube formed by the claspers.

hyporheic = the saturated zone under a river or stream, comprising substrate with the interstices filled with water.

hyposaline = water with a salinity less than that of sea water.

hyposom = hypaxial musculature.

hyposquama = the two or three layers of very flat cells which lie immediately underneath the fibrous layer of the scale.

hypothalamus = a specialised embryonic region of the ventral diencephalon of the brain giving rise to the posterior pituitary gland and certain brain nuclei.

hypothesis = a refutable statement about one or a series of phenomena; testable predictions; a falsifiable concept or idea.

hypothetical ancestor = a supposed ancestor to extant taxa given a scientific name but this is not available under the International Code of Zoological Nomenclature because it is hypothetical, lacks a species description and lacks type species fixation.

hypothetical concept = a taxonomic concept not based on a specimen(s) but on an author's idea.

hypotonic = having a lower concentration relative to the environment, e.g. a marine teleost is hypotonic to its environment (and hence tends to lose water and gain salts). Opposite of hypertonic.

hypotype = a specimen described and/or figured to increase knowledge of a previously described species. Becoming obsolete.

hypoxanthine = a chemical formed in fish muscle after death; can be used as a measure of the freshness of the fish.

hypoxia zone = dead zone (a very large dead spot in the ocean, e.g. the seasonally-depleted oxygen levels (< 2mg/l) in the Gulf of Mexico covering 18,000 sq km (increasing each year - expected to be 22,126 sq km in 2007). Fish can swim away from such areas if onset is gradual but many invertebrates die).

hypoxic = very low oxygen levels.

hypsī- = high.

hypsithermal period = a postglacial period having a climate warmer than present when some fish distributions extended further north.

hypural = one of the flattened, fused bony haemal spines fanning out at the base of the caudal fin and bearing caudal rays. *Amia* has 10 hypurals, *Salmo* 7 but in most teleosts the number is reduced or fused into a single structure, the urostyle, *q.v.*

hypural crease = hypural notch.

hypural fold = hypural notch.

hypural notch = the crease formed when the caudal fn is bent or flexed.

hypural plate = the series of bones supporting the caudal fin.

hypural spine = hypurapophysis.

hypurapophysis = a process on the arch of the parhypural (*q.v.*) in the caudal fin skeleton. It serves as the origin for the anterolateral portion of the hypochordal longitudinal muscle which inserts on the upper principal caudal fin rays, e.g. in Siluriformes.

hypurostegy = the overlapping of strengthened caudal ray bases over a strong hypural plate found in, e.g., Scombroidei, Xiphioidei, etc. An adaptation to strong caudal propulsion.

## I

i.e. = abbreviation for *id est* or that is.

IBI = index of biotic integrity (the use of fish sampling data to indicate the overall health and integrity of a stream. Measures of fish species composition, trophic composition, reproductive behaviour and abundance and condition are used. Sites with high biotic integrity have relatively high numbers of total species).

ib. = abbreviation for *ibidem*.

*ibid.* = abbreviation for *ibidem*.

*ibidem* = in the same place; used to indicate same reference or author.

IC = the entire, ventral row of photophores running from the anterior end of the isthmus to the posteriormost photophore on the caudal peduncle.

ice age = a period when glaciers covered significant portions of the planet, eliminating significant freshwater fish habitats, and marine habitats by lowering sea levels as water became locked up in ice. As the ice melted, fish recolonised these habitats, sometimes after speciating in isolation. The last major ice age was during the Pleistocene.

ice anchor = a form of anchor, *q.v.*, with a single hook used to moor a vessel to ice.

ice augur = auger (a device used to drill holes in ice for ice fishing with nets or hook and line. May be powered or operated by hand).

ice fish = ice cooled fish, iced fish as in commercial preparations. Not to be confused with icefishes (Nototheniidae, Channichthyidae).

ice fishing = fishing through holes cut in the ice of lakes or rivers, using specially designed gear and often with a shack positioned over the hole to mitigate the weather conditions. See also ice fishing under Symbols.

ice out = the period just after ice melts or is blown along a shore leaving open water, lasting about two weeks in spring.

ice pack = 1) a large area of floating ice driven closely together.

ice pack = 2) the polar sea ice.

ice shack = a small shelter for ice fishing used as a protection against the weather. Also called ice shanty.

ice shanty = ice shack.

ice shelf = thick ice, fairly flat, along polar coasts, fastened to the shore and often reaching the bottom although the seaward end floats free, sometimes over deep water. Icebergs break off this shelf.

ice-line = ice-fishing apparatus.

ice-up = formation of ice on lakes and rivers.

iceberg = a massive piece of ice broken off a glacier and floating in the ocean.

icebound = covered by ice, as in lakes in winter in northern climes.

Iceland Cod Wars = a series of disputes between Iceland and Britain over the rights to fisheries off the coasts of the former country from 1958 to 1976. On three occasions, the Icelanders extended their territorial limits from 7 km to 19 km, from 19 km to 80 km, and then to 370 km (200 nautical miles). Nets were caught, rammings occurred and some shots fired. The limit was accepted when Iceland threatened to close the NATO base at Keflavik, an important defense against the Soviet Union in the Cold War (and Cod War may be a tabloid press play on words from Cold War).

icer = the person on board a fishing vessel responsible for icing down the fish catch.

ich = 1) abbreviation for ichthyology.

ich = 2) a contagious disease of aquarium and hatchery freshwater fishes, caused by a large protozoan (*Ichthyophthirius multifiliis* or *I. hoferi*) and characterized by small white to greyish pustules on the skin and eyes, the encysted mature parasite. Fish become hyperactive, show flashing and may cut themselves on sharp objects as the parasites cause irritation. Severe infections cause respiratory problems and death. Various chemical additives such as malachite green, formalin and methylene blue can be used to treat the aquarium water. Removal of fish from the aquarium will interrupt the parasite life cycle as encysted trophozoites settle to the aquarium bottom and divide into tomites or theronts which re-infect fish skin. Also called white spot and ichthyophthiriasis.

ichnology = the study of fossilised work of an animal.

ichnotaxon = a taxon based on the fossilised work of an animal, e.g. trails, burrows, etc.

ichthic = of, pertaining to, or characteristic of fishes; having the zoological characters of a fish; piscine.

ichthidin = a substance from the egg yolk of bony fishes.

ichthin = a nitrogenous substance resembling vitellin, present in the egg yolk of cartilaginous fishes.

ichthism = poisoning from eating fish.

ichthulin = the globulin portion of fish eggs, analogous to the vitellin of birds eggs. The ichthulin of some fish eggs is poisonous to warm-blooded animals.

ichthus = 1) a representation of a fish; an amulet or talisman shaped like a fish; often a symbol of fertility. Formed from two intersecting arcs, used by early Christians as a secret symbol, and now called the Jesus fish, *q.v.*, appearing commonly on the backs of cars, and used by Alfa Romeo cars as a non-religious symbol. Also spelt ichthys, icthus, ikhthus. See also vesica piscis.

ichthus = 2) an iconographic symbol for Christ from the initials in the Greek phrase Iesous Christos Theou Huios Soter (Jesus Christ Son of God Saviour, Ιχθύς in Greek); or representing Jesus as a fisher of men.

ichthy- (prefix) = pertaining to fishes, from the Greek *ixoos*, ichthys, fish.

ichthyarchy = the domain of fishes.

ichthyic = like, or pertaining to, fishes.

ichthyism = fish poisoning.

ichthyismus = an obsolete clinical term for fish poisoning. See ichthyotoxism.

ichthylepiden = one of two albuminoid proteins found in the scales of many teleost fishes (the other being collagen).

ichthyo- (prefix) = pertaining to fishes, from the Greek *ixoos*, ichthys, fish.

ichthyoacanotoxin = envenomation from the sting of fishes.

ichthyoacanthotoxin = the poison secreted by the venom apparatus of fishes; fish venom.

ichthyoacanthotoxism = an intoxication (poisoning) resulting from injuries produced by the stings, spines, or "teeth" of venomous fishes.

ichthyoallyeinotoxin = a hallucinogenic fish poison.

ichthyoallyeinotoxism = hallucinogenic fish poisoning caused by ingesting the heads or flesh of certain types of reef fishes in the tropical Pacific and Indian Oceans. The toxicity is sporadic and unpredictable in its occurrence and is not destroyed by ordinary cooking. The symptoms develop within minutes to 2 hours after ingestion, lasting up to 24 hours or more. The poison affects primarily the central nervous system. Symptoms consist of dizziness, loss of equilibrium, lack of motor co-ordination, hallucinations and mental depression. Feelings of chest constriction, of imminent death and nightmares are characteristic. No specific antidotes are known. The stomach should be immediately evacuated, other treatment is symptomatic.

ichthyobiology = the study of the biology of fishes. A term used in Europe, particularly Poland.

ichthyocene = a fish taxocene (a taxonomically related set of species within a community), e.g. the epipelagic ichthyocene. Mostly Russian terminology, not commonly encountered elsewhere.

ichthyocentaur = a sea creature with the forefeet of a horse, a human body and a fish tail, and sometimes with a pair of lobster-claw horns. Usually shown blowing on a conch shell to raise or calm a storm.

ichthyocide = a substance which kills fishes, e.g. rotenone; piscicide is also employed.

ichthyocol = isinglass; a glue prepared from the gas bladders of certain fishes and a pure form of gelatin used for clarifying wine and beer, for making jellies, and in various other usages. Ichthyocol is made up of short needles of collagen in the tunica externa of the gas bladder.

ichthyocolia = ichthyocol.

ichthyocolla = variant of ichthyocol.

ichthyocoprolite = fossil faeces of fishes.

ichthyocrinotoxic fishes = those fishes that produce a poison by means of glandular structures often in the skin, independent of a true venom apparatus, i.e. poison glands are present, but there is no traumagenic device (such as a spine), e.g. Myxinidae, *Grammistes*, *Rypticus* (Serranidae), and Ostraciidae.

ichthyocrinotoxin = the poison produced by a glandular secretion of fishes which is not associated with a venom apparatus. Glands in the skin release their contents into the water where they are toxic and usually lethal to other fishes.

ichthyocyan = the chemical responsible for the blue and blue-green colours of the serum of Labridae.

ichthyodont = a fossil fish tooth.

ichthyodorulite = fossil spine, plate, tooth or denticle in Elasmobranchii.

ichthyoerythrin = the chemical responsible for the rose pigment in the serum of certain fishes.

ichthyofauna = fish life of a region, fish fauna. The synonym piscifauna is less commonly applied.

ichthyographer = a writer or describer of fishes.

ichthyographia = an article or report about fish; a treatise on fishes.

ichthyography = an article or report about fish; a treatise on fishes.

ichthyohemotoxic fishes = those fishes having poisonous blood, members of the anguilliform families Anguillidae, Congridae, Muraenidae, and Ophichthidae. Most of these are edible fishes, only the absorption or ingestion of fresh blood being harmful.

ichthyohemotoxin = the poison found in the fresh blood of certain anguilliform fishes. These are largely parenteral (entry not through the intestine but through skin, cuts, etc.) poisons, although some individuals have been poisoned by the ingestion of large amounts of the toxin. The poisons have hemolytic, immunological and neurological effects. They are usually destroyed by heat and gastric juices.

ichthyohemotoxicism = poisoning from absorption, injection or ingestion of fresh blood of ichthyohemotoxic fishes. Symptoms following ingestion include diarrhoea, bloody stools, vomiting, frothing at the mouth, skin eruptions, cyanosis, apathy, irregular pulse, paralysis, respiratory distress and possibly death. Local application to the eye or tongue produces inflammation and production of tears or saliva. No specific antidote is known. Some laboratory animals develop cellular immunity, others hypersensitivity, following repeated small doses.

ichthyohepatotoxic fishes = poisoning resulting from the consumption of toxic fish livers. One species of each of the following families has been implicated: Scombridae, Serranidae, Sparidae, Trichodontidae.

ichthyohepatotoxin = the poison found in the liver of ichthyohepatotoxic fishes - probably excessive amounts of vitamin A.

ichthyohepatotoxicism = poisoning resulting from eating the livers of ichthyohepatotoxic fishes. A high concentration of vitamin A is believed to be an important factor in the poisoning: ordinary cooking does not destroy the poison. Symptoms appear within 1/2 to 12 hours with maximum intensity usually within 7 hours after ingestion and consist of nausea, vomiting, fever and headache. Mild diarrhoea and facial flushing may occur. Large areas of skin may peel off between 3-30 days. Recovery is usually uneventful and no fatalities have been reported.

ichthyoid = 1) fish-like.

ichthyoid = 2) hagfishes and lampreys, similar to fishes but not true fishes.

ichthyoid blood cell = megaloblast, an erythrocyte or an abnormal blood cell in pernicious anaemia.

ichthyol = an oily substance prepared by the dry distillation of a bituminous mineral containing fossil fishes. Used as a remedy in some forms of skin diseases.

ichthyolatrous = adjective of ichthyolatry.

ichthyolatry = the worship of fishes or fish-shaped idols.

ichthyolite = a fossil of whole or part of a fish.

ichthyologic = adjective for ichthyology.

ichthyological = adjective for ichthyology.

ichthyologically = adverb for ichthyology.

ichthyologist = one who studies fish.

ichthyology = from the Greek ἰχθύ, (*ikhthu*, fish) and λόγος (*logos*, reason), the study (scientific) of fishes; the natural history of fishes; a treatise on fishes. Usually restricted to the scientific study of and the resulting knowledge about fishes, particularly in the fields of systematics, taxonomy, anatomy, zoogeography and ecology. Commercial fisheries and the study of fish stocks are not usually included under ichthyology. Dictionary definitions include the study of the structure, classification, physiology, history, habits, economic importance, etc. and it is in this more general sense that ichthyology is treated in this Dictionary.

ichthyomancy = divination by the heads or the entrails of fishes.

ichthyomania = an obsession with fishes and their study.

ichthyomantic = adjective for ichthyomancy.

ichthyomantist = someone who uses divination by the heads or the entrails of fishes.

ichthyomass = the amount of fish flesh present in a biotope at any one time; standing crop of fish.

ichthyomorph = fish-shaped.

ichthyomorphic = fish-shaped.

ichthyomorphous = fish-shaped.

ichthyoneuston = the fish part of the neuston, typically fish eggs and fry.

ichthyoneustont = a member of the ichthyoneuston.

ichthyonomy = the arrangement or classification of fishes.

ichthyonosia = a fish allergy.

ichthyotoxic fishes = those fishes that produce a poison that is generally restricted to the gonads of the fish; the musculature and other parts of the fish are usually edible. There is a definite relationship between gonadal activity and toxin production. These fishes are mainly freshwater, but a few marine species have been incriminated. The most dangerous forms are the genera *Barbus*, *Schizothorax*, *Tinca* (Cyprinidae) and *Stichaeus* (Stichaeidae).

ichthyotoxin = the poison found only in the eggs or gonads of ichthyotoxic fishes (not those also found in the flesh, etc.).

ichthyotoxicism = poisoning resulting from eating eggs or gonads of ichthyotoxic fishes. Symptoms which develop soon after ingestion of the roe include abdominal pain, vomiting, diarrhoea, headache, thirst, sensation of chest constriction, low blood pressure, chills, paralysis, coma and death. Recovery is usually made in 3-5 days. There is no known antidote. The stomach should be promptly evacuated and symptomatic treatment be given. Some ichthyotoxins are destroyed by heat, others are not.

ichthyopalaontology = the study of fossil fishes.

ichthyopatolite = fish-track (fossilised remnants of fish moving over the bottom; traces of pectoral and other fins).

Ichthyophagi = the fish-eating peoples of the Makran coast of Iran and Pakistan mentioned by Nearchus in Classical times. They are said to have eaten fish raw, dried and in fishmeal bread, wore fish skin dresses, and lived in houses with windows and doors made from whale bones. Their nets were made of the inner bark of palm trees and could stretch for a quarter of a mile.

ichthyophagan = ichthyophagist.

ichthyophagian = ichthyophagist.

ichthyophagist = one who eats, or subsists on, fish.

ichthyophagous = fish-eating or subsisting on fish.

Ichthyophagous Club = a New York club of the nineteenth century devoted to rare and choice fish dinners, along with other sea foods.

ichthyophagus = ichthyophagist.

ichthyophagy = the practice of fish-eating.

ichthyophile = a lover of fishes.

ichthyophilist = ichthyophile.

ichthyophily = a love of fishes.

ichthyophobia = 1) avoidance of fish in consequence of a taboo.

ichthyophobia = 2) fear of fishes.

ichthyophthalmite = fish eyestone, a white, pale pink, or pale green crystalline mineral.

ichthyophthira = a division of copepod crustaceans, including numerous species parasitic on fishes.

ichthyophthirias = ich (2).

ichthyoplankton = eggs, larvae and small juveniles, and adult fishes having feeble powers of locomotion; fishes capturable in plankton nets.

ichthyopolism = the sale of fish; the trade in fish.

ichthyopolist = one who sells or deals in fish.

ichthyopterygium = 1) fin (flap-like external organ concerned with locomotion in fishes. See dorsal, adipose, caudal, anal, pelvic (ventral), and pectoral fins).

ichthyopterygium = 2) more narrowly defined as the paired fin skeletons of fishes; girdle.

ichthysarcephalilepsis = see preferred synonym ichthyoallyeinotoxism.

ichthysarcotoxic fishes = those fishes that contain a poison in the flesh (including musculature, viscera, skin, or slime) which when ingested by humans will produce a biotoxication. The toxins are oral poisons believed to be small molecular structures and are generally not destroyed by heat or gastric juices.

ichthysarcotoxin = poisoning from fish flesh including muscles, viscera, or gonads (not including those due to bacteria).

ichthysarcotoxicism = poisoning from consumption of flesh including musculature, viscera, skin, slime of ichthysarcotoxic fishes.

ichthyosiform = resembling ichthyosis or of ichthyosis.

ichthyosis = a congenital skin disease in humans where the epidermis becomes hard, rough and scaly. Also called fishskin disease or fish-scale disease.

ichthyosismus = an obsolete term to designate fish poisoning. See ichthyotoxism.

ichthyosporidiosis = a fungal internal infections in fishes caused by *Ichthyophonus hoferi* or *Ichthyosporidium*. Symptoms include hollow bellies, emaciation, sluggishness, loss of balance and eventually external black cysts and sores.

ichthyotherapy = the use of fish to treat illness, e.g. certain members of the family Cyprinidae such as *Garra rufa* and *Cyprinion macrostomum* living in hot springs near Sivas, Turkey nibble at skin lesions and are said to cure psoriasis. Probably exposure to UV light and to selenium in the water is aided by removal of dead skin. Now commercially available in Europe and elsewhere using imported fish.

ichthyothereol = a plant poison interfering with respiration found in members of the family Asteraceae from the Amazon, such as *Ichthyothere terminalis*. It is a polyacetylene compound. Fish will jump out of the water if leaves are used in bait.

ichthyotic = of or relating to ichthyosis.

ichthyotomist = one skilled in ichthyotomy.

ichthyotomy = the anatomy or dissection of fishes.

ichthyotoxic = 1) poisonous from fish, i.e. the poison is derived from the fish.

ichthyotoxic = 2) poisonous to fish, e.g. reputedly certain strains of *Pfiesteria*.

ichthyotoxicology = the science which treats poisons found in fishes, their effects, nature, antidotes, and recognition.

ichthyotoxicum = the toxic principle in the blood of certain anguilliform fishes. See ichthyohemotoxin.

ichthyotoxin = a general term used to designate any type of poison derived from fishes.

ichthyotoxicism = a general term used to designate any form of intoxication (poisoning) produced by a fish.

ichthyovenin = an obsolete term for poisoning due to histamine in combination with saurine.

ichthys = ichthus.

ichthytaxidermy = taxidermy of fishes; mounting and stuffing fishes for display and preservation, and as fishing trophies.

ichtxocolle = a commercial misspelling (?) of ichthyocolle.

ichtyocolle = French spelling of ichthyocolle, sometimes used in English.

icing = putting ice among fish in a box to chill them to 0 to -0.5°C. There is a whole technology involved in this process.

ick = ich (a contagious disease of tropical marine and freshwater fishes, caused by a protozoan (*Ichthyophthirius multifiliis*) and characterized by small white to greyish pustules on the skin and eyes. Also called white spot).

iconotype = an illustration on which a new species or subspecies was based.

icosapentaenoic acid = an omega-3-fatty acid, q.v., found in fish oil; its chemical name is *all-cis*-5,8,11,14,17-icosapentaenoic acid. Said to reduce the risk of heart attacks in humans when ingested at 1800 mg per day. Also called eicosapentaenoic acid and timnodonic acid.

icotype = a specimen used for identification, worked on by the original author, or collected from the type locality, but not one used for the published description.

ichtus = ichthus.

ICZN = International Commission on Zoological Nomenclature, the judicial body empowered to enforce and interpret the International Code of Zoological Nomenclature (which presumably has the same acronym).

*id est* = that is. Abbreviated, and usually seen as, i.e.

-id (suffix) = word-ending anglicising the Latin word for a family, e.g. the perch family Percidae may be referred to as percid.

-idae (suffix) = the formal ending of the Latin name of a family , e.g. Acipenseridae.

*idem* = the same.

identification = the placing of individual specimens into previously established taxa, by deductive procedures. The determination of the taxonomic identity of an individual.

identification key = a tabulation of characters used to identify a species. Two rubrics form a couplet, the usual arrangement of keys. Each couplet gives an alternative set of characters leading to the species identity or to the next couplet. Artificial key, q.v., bracketed key, q.v., dichotomous key, q.v., indented key (or yoked key), q.v., monothetic key, q.v., natural key, q.v., sequential key, q.v.

ideotype = a specimen examined by the author of a species but not from the type locality. Also spelt idiotype.

idiom = an idiom is a phrase whose meaning cannot be determined from the words themselves as they carry a figurative meaning known through common usage. Some are also slang words and phrases, or proverbs. See also under quotations and under fish for more words and phrases that could be idiomatic. Others are scattered through this Dictionary. Fish idioms are listed below in no particular order and some undoubtedly have morphed into clichés (big fish in a small pond, red herring, neither fish nor fowl, plenty more fish in the sea, etc.):-

1 = bigger fish to fry (something better or more important to do).

2 = fish to fry (concerns or interests to pursue, or matters to attend to (usually other fish to fry)).

3 = what's that got to do with the price of fish (a phrase used to question the accuracy of some statement).

4 = "I don't think it helps people to start throwing white elephants and red herrings at each other", mangled idioms from Taoiseach of Ireland Bertie Ahern.

5 = fine kettle of fish (a bad state of affairs; a very difficult and annoying situation; something to be considered or reckoned with. Derived from kiddle or keddle, q.v., a basket set in the sluice of a dam or weir to catch fish. Kiddles were used by royal officials but were often destroyed by poachers, hence a bad state of affairs).

7 = pretty kettle of fish (fine kettle of fish).

8 = nice kettle of fish (fine kettle of fish).

9 = different kettle of fish (very different from other things mentioned).

10 = gone fishing (said of someone unaware of what is happening around them).

11 = watering hole (a pub).

12 = as slippery as an eel (included in lists of idioms but seems obvious but see below).

13 = more fish in the sea (do not be concerned about what you have lost. Often refers to lost love).

14 = plenty more fish in the sea (many other possibilities; said when current ones unsuitable or unsuccessful. Applied to people, things and situations).

15 = packed like sardines (anything tightly packed or confined, after the appearance of sardines in a can. Usually refers to people in overcrowded conditions - again in lists of idioms and fairly obvious).

16 = small fry (any insignificant person, group or thing).

17 = shark (a swindler, pickpocket or pilferer).

18 = shark (to live by swindling; to take advantage of someone).

19 = shark (to drive around a parking lot looking for a space).

20 = shark (a custom-house officer).

21 = shark (a recruit (military)).

22 = shark (reckless absence from college duties, said of persons or their conduct at Yale).

23 = shark (a lean and hungry hog).

24 = shark (to beg for a dinner).

25 = bigger fish to fry (something better or more important to do).

26 = fish out of water (a person in an uncomfortable or unfamiliar situation).

27 = neither fish nor fowl (anything not belonging to a particular class or category; indefinite; having no specific characteristics; neither one thing nor the other).

28 = neither fish nor fowl nor good red herring (anything not belonging to a particular class or category; indefinite; indeterminate; to be hesitant or undecided; having no specific characteristics; neither one thing nor the other. May appear as neither fish nor good red herring, neither fish nor flesh).

29 = shooting fish in a barrel (doing something guaranteed to be successful).

30 = fishing expedition (an investigation made with the hope of discovering information but without any clear evidence at hand when begun).

31 = swimming with the fishes (when involving concrete shoes and the criminal element, not so pleasant).

32 = fishy (extravagant, like some stories about catching fish, improbable).

33 = fishy (rank or foul).

34 = fishy (doubtful, dubious, unconvincing, questionable, suspect, seedy, effete, indisposed).

35 = fishy (dull or vacant looking eye).

36 = fishy (lacking warmth or passion).

37 = fishy (of questionable character).

38 = fishy (morally or financially dubious).

39 = fishy (intoxicated with alcohol).

40 = fishy about the gills (appearing recently drunk (Cockney)).

41 = fish (a gullible person).

42 = fish (a prostitute; probably from the resemblance of the word to flesh).

43 = fish (a corpse, especially one taken from water).

44 = fish (to seek to obtain by artifice, in a sly or indirect way, e.g. fish for compliments).

45 = fish (to search for loot).

46 = fish (a new prisoner).

47 = fish (to pull or draw out (as out of a pocket or out of boiling water, or wires in walls)).

48 = fish (a person deficient in some way (a poor fish, a queer fish)).

49 = fish (a bad poker player).

50 = fish (a dollar).

51 = fish (applied figuratively to a person whom it is desirable to catch or hook).

52 = fish (an attractive male human; a hot guy).

53 = fish (surreal or random. From the joke "How many surrealists does it take to change a light bulb?" "How many?" "Fish").

54 = fish (life mate; from the proverb "there are more fish in the sea").

55 = fish (used as an exclamation of anger to replace potentially offensive words; presumably from "By God's flesh").

56 = fish (freshman).

57 = fish (novice, beginner).

58 = fish (newcomer).

59 = fish (foreigner).

60 = fish (a victim that someone is trying to catch or hook, e.g. in a carnival game).

61 = fish (a person (poor fish, queer fish, cold fish, loose fish, etc.).

62 = fish (to search for something under water by dredging, diving or some other method).

63 = fish (to curry favour or ingratiate oneself).

64 = fish ((search for something).

65 = fish (a seaman).

66 = fish (a woman; probably from the resemblance of the word to flesh).

67 = fish (a heterosexual female in homosexual slang in the twentieth century).

68 = Fish (the Australian train between Sydney and Blue Mountain communities. Apparently several of the first crew had names related to fish).

69 = fish (female pudenda).

70 = fish (the penis).

71 = fish (a Roman Catholic, in a derogatory sense since they ate fish every Friday for religious reasons).

72 = fish (to crib or copy someone else's work).

73 = fish and flesh (you must not make fish of one and flesh of the other, meaning you must treat both alike. Fish is deemed an inferior sort of animal food to flesh. Used for its alliterative quality).

74 = fish before the net (to be premature in anticipating something).

75 = fish belly (anything white like a fish belly including certain plants where leaves are white on the underside and turned up in the wind).

76 = fish biscuit (a term for any reward that does not meet expectations. Based on the TV series "Lost" where one of the characters (Sawyer) spent most of an episode locked up and trying to solve a puzzle only to be rewarded with a fish-shaped biscuit).

77 = fish boiler (a Norwegian).

78 = fish bowl (a situation where one's activities are constantly observed, scrutinised, commented on, etc.).

79 = fish bowl (jail).

80 = fish broth (water).

81 = fish colony (Newfoundland).

82 = fish cross-handed (rowing a boat alone, especially for the purpose of catching fish (Newfoundland)).

83 = fish curve (a mathematical term for an ellipse negative pedal curve with the pedal point at the focus for the special case of the eccentricity  $e^2 = \frac{1}{2}$ ).

84 = fish dive (a ballet position where the dancer arches her back, lifts her head and bends back her legs with feet crossed. This position may be maintained while jumping or while supported, hence the name).

86 = fish dog (an experienced fisherman (Newfoundland)).

87 = fish eye (a cold or suspicious stare).

88 = fish eye (blank, expressionless).

89 = fish eye (in oil drilling fluids, slang for a globule of partly hydrated polymer formed by poor dispersion during mixing. About 0.2-0.5 inches in size, they consist of a granule of unhydrated polymer covered by hydrated polymer and so are impervious to water and do not disperse).

90 = fish eyes (slang for tapioca pudding).

91 = fish face (someone having a face reminiscent of a fish, although not necessarily having any features particularly fish-like).

92 = fish face (a term of abuse, sometimes used affectionately. Refers to an open mouth like a gaping fish and a blank expression, indicative of lack of brain function).

93 = fish flop (a somersault involving flipping feet in the air).

94 = fish for (to try subtly or deviously to obtain information or a response).

95 = fish for (to try and locate something, mechanically).

96 = fish for compliments (to try and obtain praise by subtle or devious means).

97 = fish for herring and catch a whale (to get a result other than the expected one).

98 = fish for oneself (to get all one can, to seek one's own profit exclusively).

99 = fish for oneself (to rely on one's own efforts).

100 = fish for stamps (fishing long enough to be eligible for unemployment insurance (Newfoundland)).

101 = fish home (the sea).

102 = fish hooks (fingers).

103 = fish hooks in one's pocket (to be very cheap. From Samuel Mulford who sewed fish hooks in his pockets on a visit to London in the eighteenth century to avoid pickpockets).

104 = fish in troubled waters (to try to take advantage of a confused situation. Fish reputedly bite better in rough water).

105 = fish killer (a successful commercial fisherman in Newfoundland).

106 = fish kit (supplies given to a new prisoner (toiletries, pen, paper and envelopes)).

107 = fish lip (to slobber on the end of a marijuana cigarette).

108 = fish market (the lowest hole at bagatelle).

109 = fish market (a brothel).

110 = fish monger (a bawd, presumably a corruption of flesh monger, dating from the mid-sixteenth century).

111 = fish monger (a pimp).

112 = fish monger (a lecher or whoremonger).

113 = fish monger's daughter (a whore; slang from late sixteenth century).

114 = fish on the fish's terms (doing something appropriately, being prepared).

115 = fish or cut bait (to decide, to take action or not (American slang)).

116 = fish or no fish (an expression of determination; regardless of circumstances (Newfoundland)).

117 = fish out of the coop (a capon, so-called by monks who wished to evade the Friday fast by eating chickens instead of fish).

118 = fish out of water (a person in an uncomfortable or unfamiliar situation).

119 = fish picker (a commercial fisherman (Alaska)).

120 = fish pipe (the oesophagus of a seal (Newfoundland)).

121 = fish pond (the sea (jocular)).

122 = fish story (a tall tale, an unlikely story, an exaggerated narrative, a yarn).

123 = fish tail (the uncontrolled movement of the rear end of a vehicle, e.g. on snow or ice).

124 = fish tail (to swing the tail of an aeroplane from side to side in order to reduce speed).

125 = fish to fry (concerns or interests to pursue, or matters to attend to (usually other fish to fry)).

126 = fish with a golden hook (to offer bribes).

127 = fish wrap (a low quality publication, especially a newspaper, suitable only for wrapping fish).

128 = fish wrap (ephemeral printed matter, suitable only for wrapping fish).

129 = fish wrapper (a journal, newspaper or chronicle).

130 = fish-and-fog land (Newfoundland).

131 = fisher (a toady or lickspittle).

132 = fisher dozen (or more, depending on the generosity of the fisher selling fish).

133 = fisher of souls (the devil).

134 = fishface (someone having a face reminiscent of a fish, although not necessarily having any features particularly fish-like).

135 = fishface (a term of abuse, sometimes used affectionately. Refers to an open mouth like a gaping fish and a blank expression, indicative of lack of brain function).

136 = fishing fleet (a group of women arriving en masse at a colony in search of husbands (archaic)).

137 = fishing for compliments (seeking praise).

138 = big fish (an important or influential person).

139 = big fish in a small pond (having a lot of influence over a small area).

140 = cold fish (a person who is very reserved or aloof in manner or who lacks normal cordiality, sympathy, or other feeling; emotionless; a sexually frigid person).

141 = queer fish (an eccentric; a term of contempt applied to people).

142 = drink like a fish (to drink too much alcohol).

143 = throw a sprat to catch a herring (or whale) (to forego an advantage in hope of greater profit).

144 = throw a sprat to catch a mackerel (a tradesman selling one article cheaply to attract more custom).

145 = crooked as a barrel of fish hooks (very dishonest).

146 = jump the shark (the moment when a TV show begins to decline, is desperate for ratings or goes over the top; and, by extension, anything else such as relationships. Based on an episode of *Happy Days* when a character (Fonzie) literally tried to jump a shark on water skis).

147 = lose a fly to catch a trout (one has to sacrifice something in order to get what you want (the sacrifice is minor compared to the gain)).

148 = lose in hake, but gain in herring (lose one way, but gain in another. Herrings are reputedly persecuted by hake).

149 = red herring (a diversion intended to distract attention from the real issue (herrings are reddish when smoked and odiferous, and have been used to lay false trails in fox hunting and by escaping criminals trying to confuse pursuing bloodhounds)).

150 = green around the gills (nauseated, as applied to humans. Probably based on uncured, stale fish having a greenish appearance and thus causing a potential customer to feel ill and his cheeks to appear pale).

151 = white flowers on the fisherman's garden (Irish, meaning the sea is white with breakers).

152 = fish begin to stink from the head (all corruption comes from the government or the upper classes).

153 = packed in like sardines (crowded; like sardines in a can).

154 = I like not barrel or herring (I dislike the whole of it).

155 = bring haddock back to the paddock (to spend or lose everything; to become destitute).

156 = neither (no) barrel better herring (never one better than the other, nothing to choose between them).

157 = clean the fish (to skin or lead on a victim as in a carnival game).

158 = feed the fishes (to be seasick).

159 = feed the fishes (murdered, whether weighted and sunk or not).

160 = feed the fishes (death by drowning).

161 = slippery as an eel (a good negotiator not easily pinned down on a commitment).

162 = slippery as an eel (of a person, too smart and sly to be trustworthy).

idiotaxonomy = the taxonomic study of individuals, populations, species and higher taxa; traditional taxonomy.

idoiothermous = homioiothermic (referring to organisms maintaining a constant internal temperature, usually above that of their environment. Some oceanic fishes attain temperatures above their surroundings due to muscular activity, control of a surficial vascular network and a small ratio of surface to volume, e.g. *Thunnus*).

idiotype = ideotype.

idler = the person on board a fishing vessel responsible for washing split fish before salting.

iex = abbreviation for ion exchange.

If wishes were fishes we'd all cast nets = meaning it is useless to wish for something that work could achieve. Said in mockery or as an admonishment. A variant of "If wishes were horses, beggars would ride" from an English nursery rhyme and proverb.

If wishes were fishes, beggars would fly = a less common variant of the above.

iff = a gaff (Kentish dialect).

iffing = using an iff; gaffing fish (Kentish dialect).

-iform (suffix) = 1) word ending anglicising the Latin word for an order, e.g. the perch order Perciformes may be referred to as perciform.

-iform (suffix) = 2) word ending indicating similarity, e.g. caniniform, resembling canines.

-iformes (suffix) = the formal ending of the Latin name of an order, e.g. Perciformes.

IFQ = abbreviation for individual fishing quota.

Ig Nobel = a prize awarded in imitation of the Nobel prizes, but supposed to make people laugh and then think. Awarded in 2004 to researchers on fish flatulence (see fast repetitive tick).

IGFA = the International Game Fish Association which records and maintains capture data on angled fishes.

IHN = abbreviation for infectious haematopoietic necrosis (an acute Rhabdovirus-group disease of salmonids transmitted by eggs in western North America, e.g. in chinook and sockeye salmon and rainbow trout. Particularly affects fish less than 5 cm long in water below 10°C).

ika-roa = the long fish in Maori legend that gave birth to all the stars in the Milky Way. Also called mangō roa (long shark) or mangōroa i ata (long shark in the early dawn).

ike jime = "stab death", a spike or awl driven through the head to kill fish rapidly; especially favoured by Japanese consumers and adopted in the west as a humane method.

ikhthus = ichthus.

ikhthyes = a pair of large Syrian river fish who rescued Aphrodite and Eros when they were fleeing from the monster Typhoeus and were placed in the sky as the constellation Pisces. Alternatively the two gods disguised themselves as fish to escape the monster, or that the fish assisted in the birth of Aphrodite. Presumably the large river fish are *Barbus esocinus*, a large cyprinid of the Tigris-Euphrate basin.

iki-jime = ike jime.

Ikranoye = a village on the Volga River delta at the Caspian Sea, named for the caviar produced by the sturgeons fished there. See also Caviar.

ikura = salmon roe as served in a sushi restaurant.

ile = a fishing ground inside a main tidal current between two points where there is a counter current. Fishing maybe carried on irrespective of the tide, but in the main current, only at slack water (Caithness dialect).

ileophagous = eating detritus.

ileotrophic = bottom layer.

iliophagous = ileophagous.

iliotrophic = ileotrophic.

ill-willed = said of fish unwilling to bite (Scottish dialect).

illegitimate = in taxonomy, indicates use of a name not in accordance with the International Code of Zoological Nomenclature.

illicia = plural of illicium.

illicium (plural illicia) = a long, flexible spine on the dorsal median surface of the head usually with a modified tip or esca. Believed to be modified spine from the first dorsal fin and

retractable in some species. Acts to lure prey close enough to be captured. Found in Lophiiformes.

im- (prefix) = not.

imbankment = embankment (1) a raised bank confining a river; 2) the act of making an embankment).

imbedded portion = the part of scale which is overlapped by other scales. It usually includes most of the lateral fields and all of the anterior field.

imbibition = uptake of water by non-active methods, e.g. swelling of fish eggs shortly after fertilisation.

imbricate = overlapping like shingles on a roof (with reference to scales). Sometimes used to indicate a complex pattern made up of small parts.

imitative flyfishing = matching the hatch (an angler's attempt to choose an artificial fly that resembles natural insects hatching and being fed on selectively by fish).

immaculate = spotless, without a pigmentation pattern; usually white or colourless.

immature = not ripe, not fully developed sexually.

immunology = the study of immunity, the chemical response to an infection, used to work out relationships between species based on similar responses.

imp = a length of hair twisted and forming part of a fishing line.

impaling gear = any apparatus which serves to stab and retain a fish, e.g. harpoon, spear.

impeller = an electrically driven propeller used in aquaria to push water through a pump or filter.

imperfect name = *nomen imperfectum* (an available name which when originally published met all mandatory requirements of the International Code of Zoological Nomenclature, i.e. met all criteria of availability but which contained some defect needing correction, such as names incorporating hyphens, diacritical marks or apostrophes, higher taxon names using an incorrectly formed stem).

imperforate = not pierced.

Imperial fluid ounce = 28.416 cm<sup>3</sup>. Abbreviated as fl oz<sub>BI</sub>.

impounding net = various stationary or mobile net capturing fish by confinement, e.g. cast

impoundment = an enclosed body of water, of artificial construction and with variable environmental conditions, often turbid and with varying water levels. Used to retain water, sediment or wastes.

impression = the number of copies of a work produced at one time; an edition may have two or more impressions.

impressionistic fly = an artificial fly dressed to look exactly like a natural insect.

imprinting = the process by which salmon fry memorise their home stream to which they return to spawn as adults.

improved clinch knot = used for tying flies, lures, swivels and bait hooks or line to a reel spool. More secure than an ordinary clinch knot as it will not slip. Various websites have animated steps showing how to tie this knot.

improved end loop = a knot used for making loops in leaders or heavy lines. It is stronger than a perfection loop knot but thicker; used where a secure knot is more important than delicacy. Various websites have animated steps showing how to tie this knot.

*in* = in; used in nomenclature to indicate an author of a species contained within a larger work authored or edited by another person(s), e.g. Cuvier in Cuvier and Valenciennes indicates that the species was authored by Cuvier alone.

*in adnot.* = abbreviation for *in adnotatio*.

*in adnotatio* = in an annotation; written by hand or typed on a label and pasted in a book, document or specimen label.

*in adnotatione* = *in adnotatio*.

in bulk = fish piled in layers for curing, storage or shipment.

in copulo = in the act of mating.

*in hospite* = within the host.

*in litt.* = abbreviation for *in litteris*.

*in litteris* = in correspondence or communicated in writing. Used for an unpublished source of information. NOT in literature.

in press = used when citing a reference or information from a reference that is accepted for publication but has not yet appeared (volume and page numbers not yet available, for example).

*in situ* = in the original or natural location.

*in situ* conservation = preserving habits and the species therein, cf. *ex situ* conservation.

*in situ* production = fish food produced within a culture system, e.g. algae and copepods.

*in syn.* = abbreviation for *in synonymis*.

*in synonymis* = in synonymy. Abbreviated as *in syn.*

in the round = fish delivered to a buyer intact, without being altered, cleaned or gutted.

*in vitro* = experiments or tests done in an artificial environment.

*in vivo* = experiments or tests done on living fish.

in- (prefix) = not.

in. = inch (2.54 cm).

in-line feeder = a type of feeder, *q.v.*, in angling designed to run on the main fishing line. The line runs through a small tube along the length of the feeder and the feeder can be rigged to run free or locked in place.

in-line lead = a lead weight having a section of tubing running through it and extending out on both sides. This tube helps prevent snagging on weeds.

in-line spinner = in angling, any spinner or spoon mounted on a central shaft.

in-river run = the number of fish migrating up a river estimated by adding the spawner abundance, the number of naturally produced fish entering a hatchery (if present), and the in-river harvest.

in-season adjustments = regulatory changes that affect an ongoing fishery.

inactive = in angling, said of fish that are not feeding because of a major weather change, temperature change, lowered water level, etc.

inadmissible = used of a name or epithet which cannot be used within the provisions of the International Code of Zoological Nomenclature.

-inae (suffix) = the formal ending of the Latin name of a subfamily, e.g. Etheostomatinae in the family Percidae.

inappropriate name = a name for a taxon that does not reflect a quality or character of that taxon, e.g. a colour or place. See also disagreeable name.

inarticulate = not jointed.

inasal = a broiled product made from sardines or herrings (Philippines).

inbreaker = a worker in their first season on a fishing boat, usually eligible only for a partial crew share for part of the first season and then working up to better pay (full crew share).

inbreeding depression = loss of vigour associated with repeated crosses between closely-related individuals.

*inc. sed.* = abbreviation for *incertae sedis*.

*incertae sedis* = of uncertain seat, meaning of uncertain taxonomic position or affinities.

inch = 2.54 cm. Abbreviated as in.

inchorn = the inner pocket or pouch of a fishing net (British dialect).

incidental allowance = a regulation allowing incidental catch in a fishery.

incidental catch = bycatch (fishes caught incidental to the target species; also called incidental catch or accidental catch. These fishes are usually of lesser value than the target species, and are often discarded. Some bycatch species are of commercial value and are retained for sale. The bycatch often consists of the juveniles of commercial species, and their loss has a deleterious impact on the overall yield obtained from a certain area. Also spelled by-catch). See also total catch.

incidental catch rate = the proportion of total catch which is incidental catch.

incidental harm = damage to individuals, stocks or populations of endangered or threatened species while fishing for commercial species. Usually permitted by licence where the harm is not considered critical to survival or recovery of the species.

incidental harvest = incidental catch.

incidental mention = the use of a name by an author who demonstrates no intention of adopting or introducing it, but merely mentions it without comment on its suitability; this mention does not fulfill the requirements of the International Code of Zoological Nomenclature.

incidental take = the catch of a threatened or endangered species that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

incipient = beginning to be apparent, e.g. larval structures during development.

incised = fin membranes deeply notched between the rays or spines.

incised channel = a stream that has cut its channel into the bed of a valley.

incisiform = compressed and wedge-shaped; said of teeth with a cutting edge resembling incisors of higher vertebrates, e.g. in *Serrasalmus*, the beak of Scaridae.

incisor = a flat shearing tooth with a fairly straight cutting edge, usually in the front of the mouth, e.g. *Sargus*, *Charax* (Sparidae).

incisura (plural *incisuræ*) = incisure.

*incisuræ* = plural of *incisura*.

incisure = a notch, fissure or cleft in a bone.

*incl.* = abbreviation for *inclusus*.

included = contained, e.g. the lower jaw is "included" when the upper jaw extends beyond and over it; the head length is included five times in the standard length when the length of the head can be stepped five times from the anteriormost point of the head to the base of the tail fin.

*inclusus* = included, including. Used sometimes to indicate the circumscription of a taxon by the citation of its synonyms. Abbreviated *incl.*

incognitotype = an unofficial term in nomenclature for a type whose labels have been lost. Also called dubiotype.

incoming year class = the year class of fish recruited to the fishable stock.

incomplete cleavage = meroblastic cleavage (cell division in which sister cells are only partially separated from one another by cytokinesis).

incorrect original spelling = an original spelling that is incorrect under the provisions of the International Code of Zoological Nomenclature.

incorrect subsequent spelling = any change in the spelling of an available name other than a mandatory change or an emendation.

incorrect termination = in nomenclature where the end of a name is not correct for the rank or where it does not conform to Latin grammar and the Code of Zoological Nomenclature.

increment = the region between similar zones on an otolith or other structure used for ageing. In otoliths, a daily increment comprises a D- and an L-zone, an annual zone comprises an opaque and a translucent zone.

incremental zone = L-zone (that part of a microincrement of an otolith that is light in transmitted light or is an elevated region when acid-etched and seen with a scanning electron microscope. It has less organic matrix and more calcium carbonate than the D-zone, *q.v.*).

incubate = to hold eggs during development.

incubation = 1) the period of time from egg fertilization until hatching.

incubation = 2) the act or process of hatching.

incubation channel = a man-made channel in the streambed used for hatching fish eggs.

incubation period = incubation (1) the period of time from egg fertilization until hatching, as in a hatchery).

incubator = any apparatus for hatching fish eggs.

incus Weberi = intercalarium.

indelible = written or printed matter that cannot be erased. Scientific specimen labels should be written in indelible ink, especially those for fishes that are usually preserved in ethanol.

indented = emarginate.

indented key = a dichotomous key in which the first part of a couplet is followed by all subsequent couplets. Each subordinate couplet is indented to the right for reasons of clarity; not much used in ichthyology.

independent tributary = a stream flowing directly into the sea.

indet. = abbreviation for indeterminate, may appear on labels, in reports, etc.

indeterminate = not defined, not definite, not classified. Used in reference to specimens that cannot be identified through lack of knowledge, unavailable expertise, time, missing critical characters, etc.

indeterminate growth = growth that continues as long as the fish is alive. Body size and age are correlated and there is always a larger fish out there to be caught, unlike most other vertebrates that attain a maximum adult size. However, growth slows with age.

index fishing = sampling with standard gear to determine changes in proportion of individual age-classes or stocks within species, or ratios between species.

index of abundance = a relative measure of the abundance of a stock, e.g. a time series of catch per unit of effort data.

index of biotic integrity = the use of fish sampling data to indicate the overall health and integrity of a stream. Measures of fish species composition, trophic composition, reproductive behaviour and abundance and condition are used. Sites with high biotic integrity have relatively high numbers of total species. Abbreviated as IBI.

index species = indicator species.

India ink = a permanent and waterproof black ink often used in handwritten labels for museum specimens.

Indian cure salmon = brined strips of salmon hard smoked for about two weeks at 21-36°C.

Indian major carps = commercially important fishes of the family Cyprinidae, used in aquaculture, namely rohu (*Labeo rohita*), catla (*Catla catla*) and mrigal (*Cirrhinus mrigal*). See also Chinese major carps.

Indian minor carps = commercially important fishes of the family Cyprinidae, used in aquaculture but not as important as the Indian major carps, namely reba (*Cirrhinus reba*), bata (*Labeo bata*), calbasu (*Labeo calbasu*), white carp (*Cirrhinus cirrhosus*) and Cauvery carp (*Labeo kontius*).

Indian style salmon = Indian cure salmon.

Indiana blade = in angling, a type of spinner or spoon blade, oblong in shape and intermediate between a Colorado, *q.v.*, and willowleaf, *q.v.*, blade in action.

Indiana reel = a large diameter, narrow fishing reel with forked spokes around the ends of which the line is wound. The large diameter made for rapid retrieval and the narrow spool facilitated thumbing during the cast.

indication = published information that in the absence of a definition or description allows a name proposed before 1931 to be considered available or in the absence of an original designation (*q.v.*) determines the type-species of a nominal genus.

indicator = 1) a floating object placed on the leader or end of a fly line to track the movement of the line or to indicate a bite. Used with nymphs and a slack line, for example.

indicator = 2) biological indicator (a fish whose presence in a water body is indicative of certain environmental conditions).

indicator species = 1) a fish species whose status provides information on the overall condition of the ecosystem and of other species in that ecosystem; fish that are sensitive to environmental conditions and which can therefore be used to assess environmental quality.

indicator species = 2) a microorganism or a group of microorganisms, harmless themselves, but serving to indicate the presence of pathogens in fish food products. The harmless microorganisms are easier to detect than the pathogens.

indigenous = native to a particular area.

indigenous fishing = fishing undertaken by peoples native to an area.

indirect fishing = taking fish by means not involving usual methods such as nets, traps and hooks, e.g. removing fish from eagle nests, taken there by the bird to feed nestlings, in early nineteenth century Hungary; removing fish from pelican pouches by the Sumerians.

indirect methods = methods for stock assessment based on fishery-dependent data, e.g. catch and effort statistics, age structure of the catch.

indirect reference = a clear statement that the description of a taxon for which a new name is given has been effectively published in an earlier work.

individual fishing quota = individual quota.

individual fishing share = individual quota.

individual non-transferable quota = allocation of total allowable catch to individual fishermen or companies but not as long-term rights because they are not tradable by their holders.

individual quota = a quota, e.g. a percentage, of a total allowable catch assigned to an individual, a vessel or a company, with the numbers of the latter limited too. A quota for a company and its fleet of vessels is usually called an enterprise allocation. Also called individual fishing quota and individual fishing share. This quota is supposed to give fishers a feeling of stock ownership by guaranteeing their share of the catch, eliminating competition in gear and effort to catch the biggest share of the catch. It therefore encourages conservation, cuts fishing costs, and fishing is directed to the best quality and prices. Results have been mixed as high grading (*q.v.*) may occur. Abbreviated as IQ or IFQ.

individual transferable quota = a fixed share of the catch assigned to each fisherman or vessel owner as a tradable right, one that can be sold or leased to others. This may make an operation more efficient as some fishers buy the quotas of others and fleets can be reduced or rationalised with less government interference. As above, results are mixed as wealthier fishers benefit and the owner-operator system is disadvantaged. Abbreviated as ITQ. Also called catch share.

individually quick frozen = fish, usually as fillets, that are rapidly frozen, in various sizes. Abbreviated as IQF.

indraft = an inward flow.

induced breeding = causing fish to reproduce in captivity.

induced spawning = laying of eggs by artificial stimulation, e.g. changes in the light regime, fertility cycle, salinity or temperature, osmotic shock, UV irradiation.

indulgence = a box placed beside the splitting table and constantly replenished with cod to be processed (Newfoundland).

industrial fishery = a fishery directed to the capture of fish for purposes other than food for humans, e.g. animal feed, fertiliser, oil. Occasionally used for fish meant to be canned or for fishing on a large scale for food. Removes many fish from the base of the food chain.

industry = the fishing industry includes both recreational, subsistence and commercial fishing, and the harvesting, processing, and marketing sectors.

-ine (suffix) = word ending anglicising the Latin word for subfamily, e.g. Etheostomatine.

*indet.* = abbreviation for *indeditus*.

*indeditus* = unpublished; used for example on a specimen label as a handwritten name, a name in a manuscript, and a work in press.

infauna = animals living in the soft bottom or substrate.

infection = bacteria, viruses and fungi invading and multiplying in the fish body. The infection may not be readily apparent. May refer to a specific infectious disease, *cf.* infestation.

infectious dropsy = an acute haemorrhagic viral infection of Cyprinidae, in particular of cultured *Cyprinus carpio*, usually appearing in spring. Symptoms include loss of coordination and equilibrium, popeyes, swollen belly, inflamed and swollen vent, and oedema and haemorrhages of various organs. Also called spring viraemia. See also bacterial haemorrhagic septicaemia.

infectious haematopoietic necrosis = an acute Rhabdovirus-group viral disease of salmonids transmitted from fish to fish and by eggs in western North America, e.g. in chinook and sockeye salmon and rainbow trout. The disease destroys the haematopoietic tissues in the kidney and spleen. Fish become lethargic or hyperactive, dark in colour, develop popeyes, anaemia (pale gills) and a swollen belly, and produce faecal casts. Haemorrhages on the skin, viscera and fins occur. Particularly affects fish less than 5 cm long in water below 10°C with high mortality. Potentially dangerous to humans. Abbreviated as IHN. Also called sockeye salmon virus.

infectious pancreatic necrosis = a viral disease (Birnaviridae) particularly of juvenile salmonids, usually in hatchery fish less than 5 cm long. Whirling, darkening, protruding eyes, abdominal distension and haemorrhages of the belly and fin bases, and mucoid faecal casts are external symptoms. Gelatinous material in the anterior intestine is indicative of this disease and hyaline degeneration of skeletal muscle occurs. Causes fatal infections of the pancreas.

infectious salmon anaemia = a viral disease of salmonids such as Atlantic salmon, sea-run brown trout and rainbow trout. The anaemia leaves fish open to other diseases and the kidneys may haemorrhage and the spleen swell. The disease is transmitted from fish to fish and from sea lice to fish. Abbreviated as ISA.

inferior = ventral, below. Used in reference to a mouth on the lower surface of the head.

infestation = presence of parasites inside or on an organism, cf. infection.

infestation intensity = the number of parasites in relation to the number of fish.

infestation rate = the number of infested fish in relation to the number of fish examined.

infeudated = restricted; ecologically restricted to a niche or area.

inflated = swollen or expanded; said of anatomical structures.

inflated worm method = in angling, inserting an air bubble into a worm with a hypodermic needle.

inflow = flowing in.

influent = 1) flowing above the water table and losing water to it.

influent = 2) said of a lake having a single inflowing stream.

influent = 3) water that flows into sink holes, cavities and porous material and disappears into the ground.

influent stream = losing stream (a stream or a part of a stream that loses water to the groundwater).

influx = flowing in.

informal name = a name used as a temporary, interim or working name in taxonomy while a taxon is being studied, e.g. Genus "sp. 3".

informosome = a molecule composed of RNA and protein found in the cytoplasm of eggs of fish and echinoderms and thought to be transmitted from the nucleus to the cytoplasm.

infra- (prefix) = below, beneath, sub, smaller.

infracaudal luminous gland = a long ventral median luminous gland in Myctophidae (ICG in illustration).

infraclass = a rank between subclass and superorder.

infraclavicle = a misnomer for the ectocoracoid (a paired dermal bone in Gasterosteiformes connected with the coracoid and extending posteriorly. Has also been applied to the element below the scapula and applied to the coracoid in Dipnoi), in fishes.

infradian rhythm = a biological rhythm with a periodicity longer than 28 hours or with a frequency less than one cycle per 24 hour, e.g. lunar and seasonal rhythms.

infrafamilial = below the rank of family.

infrageneric = below the rank of genus.

infrahaline = fresh water having a salinity less than 0.5 parts per thousand.

infralittoral = 1) the depth zone of a lake with rooted vegetation.

infralittoral = 2) the upper subdivision of the marine sublittoral zone dominated by algae with a lower limit where light is about 1% of the surface level.

infralittoral = 3) the zone between low tide and 100 metres.

inframandibular = a very small bone between the outer side of the articular and the dentary in *Umbra* (Umbridae) and *Stenodus* (Salmonidae).

infraoral = below the mouth.

infraoral cusp = the tooth just below the mouth in lampreys (Petromyzontiformes).

infraoral lamina = the teeth just below the mouth in lampreys (Petromyzontiformes).

infraorbital = below the eye, suborbital.

infraorbital bone = one of a series of dermal bones generally below the eye. Name applied to the first six circumorbital bones: infraorbital 1 (lachrymal or preorbital), infraorbital 2 (jugal), infraorbital 3 (true postorbital), infraorbitals 4 and 5, and infraorbital 6 (dermosphenotic). Associated with the infraorbital lateral line. Suborbital bones, *q.v.*, are recognised by some authors as a separate series, sometimes used as a synonym for infraorbital.

infraorbital canal = the cephalic lateral line canal (*q.v.*) extending from behind and below the eye to behind the upper lip. Abbreviated as IO.

infraorder = a rank between suborder and superfamily; any rank below order.

infrapharyngobranchial dental plate = a tooth-bearing plate of dermal origin covering the upper surface of the fifth ceratobranchial. The plate may be divided into two parts with differing tooth types, e.g. in *Merluccius*. Also called lower pharyngeal bone.

infraspecies = within the species, below the species level. As used by various workers not of taxonomic status unless later elevated to species or subspecies.

infraspecific = adjective for infraspecies.

infrasubspecific = of a category, taxon or name, of lower rank than the subspecies, and, as such, not subject to recognition by the International Code of Zoological Nomenclature, e.g. form, race, variety.

infrasubspecific entity = 1) taxa below the rank of species.

infrasubspecific entity = 2) specimens within a species differing from others through intrapopulational variation, e.g. opposite sexes, aberrations, different generations, polymorphism, etc.

infraventral = one of a series of cartilaginous elements lying on the lower surface of the basiventrals below the vertebral centrum, which help enclose the haemal canal ventrally in Rajiformes.

infundibuliform = funnel-shaped.

infundibulum = a short stalk from the floor of the diencephalon to the pituitary in the brain.

infusorians = a general term for a variety of small aquatic organisms cultured and fed to small fish fry in aquaria. Vegetable matter, such as a crushed lettuce leaf, is left in a jar of water in a sunny spot. Once this jar of water becomes cloudy with infusorians, small quantities can be added to the aquarium.

ingesta = the total intake of food or energy through ingestion.

ingestion = taking in food, usually by swallowing.

ingroup = in a cladistic analysis, the set of taxa which are hypothesized to be more closely related to each other than any are to the outgroup, a monophyletic group (usually the one being studied).

inguinal process = axillary process (a small triangular appendage or a modified scale at the upper or anterior base of a paired fin. Also called accessory scale or fleshy appendage. Functions apparently to streamline the fin when held against the body while swimming).

-ini = the ending of the name of a tribe.

initial phase = the first adult colour phase of a sexually dichromatic fish. Also called primary phase.

initium = the centre of origin of growth of the fin ray.

ink sac = the gland discharging into the cloaca of Lophotidae.

inkfish = not a fish but a cuttlefish.

inland fishery = a fishery in fresh or brackish water away from the sea coast.

inland sea = a large lake.

inland water = surface water existing inland including lakes, ponds, streams, rivers, natural or artificial watercourses and reservoirs, and coastal lagoons.

inlet = 1) an indentation in a shoreline, may be small or long and narrow.

inlet = 2) a short, narrow waterway connecting a bay or lagoon to a larger body of water.

inlet = 3) an entry point for water, e.g. a stream entering a lake.

inlet gorge = the deepest part of an inlet.

INM = abbreviation for a nautical mile (1.852 kilometres, 1.151 miles or 1 minute latitude of the great circle of the earth).

innate = inborn, inherited, e.g. innate behavior is that fixed element of behaviour which is inherited and not learned.

inner corner = corner or angle of pectoral fin close to the body.

inner ear = the auditory organ lying in the otic capsule, consisting of the semicircular canals, ampullae, utriculus, sacculus, lagena, sinus endolymphaticus and ductus endolymphaticus. Filled with and surrounded by perilymph (or seawater in forms with an endolymphatic duct), containing otoliths (sagitta, astericus and lapillus in teleostomes). Functions as a gravity receptor, acceleration detector and muscle tone regulator. Innervated by cranial nerve VIII.

inner net = lint (the inner net panel of a trammel net).

innominate bone = the pelvic fin bone in Gasterosteidae, sometimes a misnomer for the ectocoracoid. Also called pelvic bone, pelvic plate, posterior process, pubic bone and medial plate.

inophyllolide = a plant piscicide from the leaves and seeds of *Calophyllum inophyllum* (Guttiferae), used on the Malay Peninsula. Other piscicidal plant chemicals include callicarpone, huratoxin, ichthyothereol, juglone, justicidin, maingayic acid, rotenone, and vibsarine, all q.v.

input controls = management restrictions placed on the amount of effort input into a fishery, e.g. by restricting types and size of fishing gear and boats and the amount of fishing time.

input stuffing = a fishery uses various factors of production (called inputs) to produce a certain level of catch. Managers of the fishery may attempt to limit the catch by controlling certain inputs but not others. This may fail because fishing businesses substitute more of the uncontrolled inputs for the controlled inputs in an attempt to maintain their catch.

input substitution = input stuffing.

inquiline = lodger; an animal that lives habitually in the cavity or abode of some other species, causing no harm, e.g. *Nomeus* in the Portuguese man-of-war, *Physalia*; *Fierasfer* in the pearl oyster, *Meleagrina*; *Paraclinus marmoratus* in finger sponges; *Gilbertidia sigalutes* in sponges, and *Carapus* in sea cucumbers. But see also endoparasite.

inquilinus = an unofficial term in nomenclature for a taxon that has been naturalised. Abbreviated as inq.

inscale = one of a series of ratings at the lower end of a wicker trap in a river (Scottish dialect).

insectivore = a feeder on aquatic and terrestrial insects.

insert waggle = in angling, an insert tip pushed into a float. The insert tip is much thinner than the tip of a normal waggle float, q.v., and tips can be changed to allow for changing conditions.

insertion (fin) = the posterior end of a dorsal or anal fin. In paired fins the uppermost, anteriormost, or outermost end of the fin base or the end closest to the most highly developed ray in paired fins (insertion and origin are often used interchangeably in paired fins).

insertion (muscle) = end of a muscle attaching to a moving part. Opposite of origin.

inshore = in shallow waters near the shore; closer to land than the breaking waves.

inshore cod = cod migrating to, and taken in, inshore waters adjacent to the land (Newfoundland).

inshore fisherman = a worker in the inshore fishery.

inshore fishery = a fishery carried out near the shore in small, open boats and usually within territorial waters.

inshore waters = shallow waters at a small distance from the shore. Also called onshore or nearshore waters.

inshoring = the coming in of herrings towards the shore (Norfolk dialect).

inside door = the entrance to a cod trap, situated nearest to the land (Newfoundland).

inside stage = a shed on a fishing stage where split cod are salted and piled in Newfoundland.

instant fish = a commercial venture by the Wham-O Toy Company in the early 1960s. Members of the killifish family from Africa lay eggs in mud at the beginning of the dry season and these hatch when it rains. The idea was to sell mud or a mud substitute containing the eggs, adding water would result in "instant fish". However the idea was not commercially viable as not enough eggs were laid at a time but the eggs have been used in a limited way for educational purposes.

instantaneous count = a count of anglers or boats made quickly from an airplane, bridge, boat or other vantage point.

instantaneous mortality = the percentage of fish dying at any one time.

instantaneous rate of fishing mortality = used to describe the decrease in numbers of fish over time when fishing and natural mortality act concurrently ( $N_t = N_0 * e^{-Zt}$ , where  $N_0$  is the initial number and  $N_t$  is the number of the remaining fish at the end of time  $t$ .  $Z$  is the instantaneous total mortality rate, usually composed of  $M + F$ , where  $M$  is the natural mortality rate and  $F$  is the mortality rate caused by the fishery). Abbreviated as  $F$ . Also called rate of fishing; instantaneous rate of fishing mortality, force of fishing mortality.

instantaneous rate of growth = a measure of the weight increase, the natural logarithm of the ratio of final weight to initial weight of a fish in a unit of time, usually a year. When applied collectively to all fish of a given age in a stock, the possibility of selective mortality must be considered (Ricker, 1975). Abbreviated as  $g$  or  $G$ . The formula is  $g = [\ln(W_t) - \ln(W_0)]/(t_1-t_0)$  where  $W_t$  is the weight of the fish after  $t_1$  days and  $W_0$  is the initial weight.

instantaneous rate of mortality = the natural logarithm (with sign changed) of the survival rate. The ratio of number of deaths per unit of time to population abundance during that time, if all deceased fish were to be immediately replaced so that population does not change (Ricker, 1975). Abbreviated as  $Z$ . Also called coefficient of decrease.

instantaneous rate of natural increase = instantaneous rate of surplus production.

instantaneous rate of natural mortality = when natural and fishing mortality operate concurrently it is equal to the instantaneous total mortality rate, multiplied by the ratio of natural deaths to all deaths (Ricker, 1975). Abbreviated as  $M$ . Also called force of natural mortality.

instantaneous rate of recruitment = number of fish that grow to catchable size per short interval of time, divided by the number of catchable fish already present at that time. Usually given on a yearly basis, i.e. the figure just described is divided by the fraction of a year

represented by the short interval in question. This concept is used principally when the size of the vulnerable stock is not changing or is changing only slowly, since among fishes recruitment is not usually associated with stock size in the direct way in which mortality and growth are (Ricker, 1975). Abbreviated as  $z$ .

instantaneous rate of surplus production = equal to rate of growth plus rate of recruitment less rate of natural mortality - all in terms of weight and on an instantaneous basis. In a balanced or equilibrium fishery, this increment replaces what is removed by fishing, and rate of surplus production is numerically equal to rate of fishing (Ricker, 1975). Also called instantaneous rate of natural increase.

instantaneous rate of total mortality = the ratio of number of deaths per unit of time to population abundance during that time, if all deceased fish were to be immediately replaced so that population does not change. Also called coefficient of decrease.

instinct = the inherited, unlearned component of behavior.

instream cover = the layers of vegetation such as trees, shrubs, fallen limbs and overhanging vegetation, that are in the stream or immediately adjacent to the wetted channel.

instream use = uses of water within the stream channel, e.g. fish and other aquatic life, fisheries, recreation, navigation, and hydroelectric power production.

insular = 1) relating to, or characteristic of, or situated on an island.

insular = 2) isolated geographically.

insulin = a polypeptide, pancreatic hormone involved in sugar balance although in fish it is more probably involved in controlling protein metabolism.

intake = 1) a place where water is taken in.

intake = 2) the amount of water taken in by an intake.

integrated analysis = stock assessment methodologies that attempt to integrate multiple sources of data into a single estimation framework, e.g. total landings by fleet, size samples of landings, discard estimates, size samples of discards, standardized CPUE by fleet, fishery-independent surveys, and tagging records on movement, growth and recoveries.

integrated aquaculture = an aquaculture operation where many aspects are under its control, including such items as feed supplies and marketing at either end of the process of producing fish.

integrated fish farming = fish aquaculture with other organisms, e.g. ducks, pigs, poultry, and crops.

integrated management = a system where competing environmental, sociological and economic issues are considered together in order to optimise results for the community and ecosystem.

intensity = 1) effective fishing effort.

intensity = 2) fishing effort per unit area (must be proportional to fishing mortality through the relation  $F = q(f/A)$  where  $(f/A)$  is the fishing intensity and "q" the catchability coefficient).

intensity = 3) effectiveness of fishing.

intensive culture = an aquaculture system in a carefully controlled environment with a very high number of fish that depends on external inputs such as food, oxygen, and/or water exchange under optimal conditions. Most intensive culture systems are not sustainable in the medium or long term. Also called intensive farming.

intensive farming = intensive culture.

inter- (prefix) = between.

inter-annual = between years, in terms of comparing populations or events.

interaction = positive and negative associations between species that favour or inhibit mutual growth and evolution of populations. It may take the form of competition, predation, parasitism, commensalism or mutualism.

interactive feeding system = in aquaculture, a food release system triggered by detection of wastes or by monitoring fish behavioural responses.

interarcual cartilage = cartilage connecting the epibranchial bone of the first gill arch to the infrapharyngobranchial bone of the second gill arch.

interbasin transfer = the diversion of water from one drainage basin to one or more other drainage basins.

interbranchial septum = the tissue layer separating the two halves of the gill (hemibranchs). They extend to the exterior and are continuous with the skin in Elasmobranchii but are reduced in other fishes and do not project beyond the hemibranchs.

intercalar = a separate sesamoid bone, forming the posterior wall of the otic or auditory capsule, between the prootic, pterotic and the exoccipital and associated with the ventral process of the posttemporal. Also called opisthotic, *q.v.* and sometimes applied to the autopterothic. Absent in Siluridae and with a foramen for the glossopharyngeal nerve in Gadidae.

intercalare = an additional element in the vertebra.

intercalarium = 1) the third of the four Weberian ossicles, *q.v.*, comprising an ascending process, an horizontal process where the interossicular ligaments attach connecting the scaphium, intercalarium and tripus), and a peg-like articular process with the second centrum.

intercalarium = 2) baseost (the distal radial or pterygiophore supporting the fin rays).

intercalary = intercalar.

intercalated = inserted, to insert among others, e.g. intercalated scales are extra scales added between the regular scales, after their formation.

intercentrum = with two pleurocentra, the two intercentra unite to form the centrum of a vertebra.

intercept survey = creel census (the estimation of anglers' catches, usually by a sampling program involving interviews and inspection of individual catches on a particular stream, lake or other area; a survey of the recreational fishery that quantifies the fish landings at public piers and docks).

interclavicle = urohyal (a flat, median, deep, endochondral bone below the ceratohyal; a tendon bone arising in the septum between the longitudinal muscles of the isthmus. Absent in such primitive fishes as *Lepisosteus*. Also called clidost, episternal and parahyoid).

intercleithral cartilage = one of the median cartilages lying between the ventral ends of the cleithra of Gobioidei. The ventral intercleithral cartilage is smaller and lies between the antero-ventral tips of the cleithra. The pelvic intercleithral cartilage lies between the postero-ventral tips of the cleithrum and the pelvic bone.

intercostal = between the ribs (arteries, veins, muscles).

intercostal artery = a series of arteries extending ventro-laterally from the dorsal aorta to serve the intercostal muscles and, as branches, the pectoral and pelvic appendages.

intercuale = a small muscle of the gill arches.

interdorsal = a cartilaginous structure between the basidorsals and the vertebral centra, which helps enclose the neural canal.

interdorsal ridge = a raised part of the body between the dorsal fins.

interested party = anyone or group having an interest in the fishery being managed, e.g. commercial, recreational, conservation, exploitation, artisanal, industrial, fisher, buyer, processor, trader, governments, general public, consumers, etc. A wider term than stakeholder.

interflow = the subsurface flow of groundwater between catchments or watersheds.

interglacial = a period during an ice age when glaciers retreated because of milder temperatures.

intergrade = the progeny of interbreeding of two or more subspecies of the same species.

interhaemal = an undesirable term for the anal fin ray supports. See radials or pterygiophores. Also spelled interhemal.

interhaemal bone = one of a series of bones found between the haemal vertebral spines and the anal fin pterygiophores, e.g. in Gempylidae and Trichiuridae.

interhemal = interhaemal.

interhyal = the deep, endochondral bone between the hyomandibular and symplectic bone and above the epihyal in the hyoid arch. Absent in Dipnoi. Also called stylohyal but not homologous with the stylohyal of Tetrapoda.

interim name = informal name.

interlittoral = the marine zone between low tide and about 20 metres.

intermaxillary = premaxilla (one of the paired, superficial, usually toothed, dermal bones of the upper jaw, proximal or anterior to the maxillaries; in primitive Teleostomi they comprise the middle, in more advanced forms they may comprise the whole, of the oral edge of the upper jaw. Teeth may be present. In Diodontidae, the premaxillae are ankylosed and form a single bone. Absent in Chondrostei. In Holostei (*Lepisosteus* and *Amia*) the bone has two ossification centres and therefore is a double bone. Holostei and Teleostei have an ascending process anteriorly but these may not be homologous. Posterior to the ascending process in Teleostei there may be an articular and a postmaxillary process, and a posterior extension, the caudal process. Also called premaxillary, surmaxillary or bimaxillary).

intermaxillary gland = a gland lodged in a fossa formed mainly of dermal bones, situated wholly in front of the nasal capsules of Osteolepiformes.

intermediate fishing = removal of fish from an aquaculture facility to thin out excessive numbers so the remaining fish can grow more efficiently.

intermediate host = a fish in which a parasite passes a larval or non-reproductive phase.

intermediate mass = a very early blood rudiment located deep to the somites in the posterior trunk at a stage before the blood cells collect into the more prominent blood island.

intermediate spine = a paired ventral spine not of the pectoral or pelvic fins found in Early Devonian acanthodians (Gagnier and Wilson, 1996).

intermittent = said of a stream with interrupted flow or discontinuous flow. Opposite of perennial, q.v. Also said of lakes in karstic regions which drain every year.

intermittent spawning = spawning at intervals; see batch or fractional spawner.

intermuscular bone = a rib bone lying in the horizontal septum between the epaxial and hypaxial muscles or in the myocommata of the epaxials. See also myorhabdoi, epineurals, dorsal ribs.

internal bearer = internal fertilisation with females carrying embryos and/or young.

internal carotid artery = an artery originating at the junction of the first two aortic arches and supplying the anterior brain.

internal fertilisation = the deposition of sperm within the female by the male. Most fishes shed eggs and sperm to the outside so fertilisation is usually external.

internal filter = a filter for aquaria that is placed and functions inside the aquaria.

internal live bearer = an ecological group with several reproductive guilds (*q.v.*) where eggs are fertilised internally and young are born alive.

internal naris or nostril = a canal (opening) communicating between the nasal cavity and the mouth, thus providing access to the exterior; also called choana.

internal water = water on the landward side of the baseline of the territorial sea, e.g. river mouths, creeks, ports, harbors and canals.

internal yolk syncytial layer = the portion of the yolk syncytial layer that lies deep to the blastoderm during epiboly.

internarial = between the nostrils.

internarial flap = a ridge or ridges between the incurrent and excurrent nostrils. This may serve to divert a flow into the incurrent nostril and over the olfactory lamellae and out the excurrent nostril as the fish swims through the water or holds position in a current.

internasal = the area of the snout between the nostrils.

internasal gland = a gland in the endocranial cavity situated between the nasal capsules mainly in the internasal wall of Porolepiformes.

internasal pore = a pore between the nostrils, e.g. in certain *Noturus* (Ictaluridae).

internasal valve = a fleshy flap extending between the nostrils and partly covering the mouth of rays.

International Code of Zoological Nomenclature = the rules and recommendations adopted world-wide for zoological nomenclature. Adopted by the International Congresses of Zoology (more recently the International Union of Biological Sciences) and administered by the International Commission on Zoological Nomenclature. The most recent version of the Code is the Fourth Edition published in September 1999 and taking effect on January 1st 2000.

International Commission on Zoological Nomenclature = the organization responsible for preparing the International Code of Zoological Nomenclature.

international food fisheries = those fisheries taking place beyond territorial waters and coastal zones of sea-girt nations.

international notification = said of a name that is listed in Zoological Record (*q.v.*) within five years of its publication.

International Zoological Congresses = the legislative bodies responsible for the rules of the International Code of Zoological Nomenclature and for authorization of the activities of the International Commission on Zoological Nomenclature until 1972 when responsibility was transferred to a General Assembly of the International Union of Biological Sciences.

interneural = slender, median, deep bones lying vertically at the juncture of the vertical and longitudinal myocommata above the vertebrae. Sometimes incorrectly applied to the dorsal fin ray supports properly called radials or pterygiophores.

interopercle = the paired dermal bone of the lower gill cover below the horizontal arm of the preopercle and in front of the subopercle. Connected to the mandible by a ligament. Absent in *Lepisosteus* and Siluridae.

interopercular bone = interopercle.

interoperculum = interopercle.

interorbital = between the eyes.

interorbital septum = a thin sheet of bone or cartilage lying vertically under the midline of the skull, separating the eyes.

interorbital space = the space on top of the head between the eyes. Measured at its narrowest point. Either the fleshy or the bony width may be measured. In the fleshy width no pressure is exerted by the dividers, in the bony width the dividers are squeezed to obtain the width of the bone.

interparity = repeated reproduction, usually on an annual basis, in contrast to reproducing once and dying (semelparity).

interpelvic process = a fleshy process between the inner edges of the pelvic fins in some members of the Scombridae like tunas.

interpelvic space = the least distance between the bases of the pelvic fins.

interpolated category = categories of names not specified in the International Code of Zoological Nomenclature (the categories above superfamily).

interpolated name = a name placed within parentheses after a generic name to denote a subgenus, or after a genus-group name to denote an aggregate of species, or after a specific name to denote an aggregate of subspecies. Names used in this way are not counted as one of the names in a binomen or trinomen.

interpretotype = specimens interpreted by the originating author as belonging to the same taxon as the one proposed, i.e. authentic specimens or expertly-identified specimens.

interpterygiophore artery = an artery branching dorsally from the supraspinous artery, *q.v.*, to serve each interpterygiophore muscle.

interradial = between the rays (or spines), e.g. interradial pigment is pigment on the membrane between the rays.

interradial membrane = the tissue between the fin rays or spines.

interradial window = a perforation in the membrane between the dorsal and anal fin rays and next to the body in *Diretmus* (Diretmidae).

interrenal gland = a yellowish endocrine gland producing corticosteroids, controlling water metabolism, stress and release of lymphocytes. Located between the kidneys (Elasmobranchii), or the heads of the kidney (Teleostomi).

interrupted publication = a publication issued in parts separated by periods of time. Could refer to a publication bearing a publication date but actually published later e.g. through delays caused by war. The latter case can cause confusion in dating of scientific names.

intersexual = involving both sexes.

interspace = space between two parts, e.g. the gap between the two dorsal fins or between the pelvic fins, between parr marks in Salmonidae.

interspecific = between two or more species; a hybrid between two distinct species.

interspinal artery = a paired branch of the dorsal aorta or caudal artery which fuses and extends to the dorsal tip of each neural spine. This artery joins the supraspinous artery running antero-posteriorly at the dorsal tips of the neural arches.

interspinous bone = 1) dorsal pterygiophore; one of a series of bones forming the internal support for the dorsal and anal fins, called interspinous because they interdigitate with the neural spines of the vertebrae, for example.

interspinous bone = 2) interneural and interhaemal bones.

interspinous membrane = the membrane between fin spines.

interstacial = long intervals of desiccation between pluvial periods.

intersticine = living in small spaces, cavities or between and under rocks.

intertaxon = a hybrid between two taxa.

intertemporal = supratemporal-intertemporal (a dermal bone overlaying the pterotic (or autopterotic). Also called membranopterotic or dermopterotic).

intertidal = the shore exposed between high and low tides.

interventral = a cartilaginous element of the vertebral column which alternates with the basiventrals to enclose the haemal canal laterally.

intestinal arteries = branches of the coeliac artery that serve the enlarged proximal loop of the intestine and the intestinal diverticula (anterior intestinal artery) and the straight posterior terminal portion of the intestine (posterior intestinal artery).

intestine = often used for most of the gut of fishes as many lack a stomach, although strictly that stretch from the stomach, when present, to the cloacal aperture.

intestinal valve = a fold in the intestine which increases surface area for processing food without lengthening the intestine. Found in Elasmobranchii and Acipenseridae, for example. See also ring, scroll and spiral intestinal valves.

intestinal vein = delivers blood from the posterior intestine to the hepatic portal vein.

intra- (prefix) = within, inside between.

intracranial joint = the joint between two divisions of the Crossopterygian braincase. It may help in the consumption of large prey by suction in coelacanths.

intradentary = coronoid (a paired dermal bone bearing teeth located on the upper edge of Meckel's cartilage. One pair is found in Acipenseridae and two pairs in *Amia* and *Lepisosteus*. Also called presplenial, splenial and prearticular).

intrageneric = within the same genus; among members of the same genus.

intrasexual = involving only one of the sexes.

intraspecific = within a species.

intraorbital = an ossification of the anteroventral portion of the membrane in the orbital cavity confined to certain genera of Eleotridae.

intraspecific = within a species; among members of the same species.

intrinsic = gas bladder muscles with both ends inserting on the gas bladder, as opposed to extrinsic.

intrinsic growth rate = how much a population can grow between successive time periods when not slowed down by competition. Often estimated with production models and plays an important role in evaluating the sustainability of different harvest levels and the capacity to recover after depletion. Abbreviated as r.

intrinsic quality = the quality of the fish at the time of capture. Includes species, size, condition, composition, fat content, damage, parasites, pathogens, taints, toxins and contaminants.

intrinsic rate of increase = the change in the amount of harvestable stock estimated by recruitment increases plus growth minus natural mortality.

intrinsic sonic muscles = striated muscles of the gas bladder wall, used in sound production by contraction, e.g. *Porichthys notatus* (Batrachoididae). See also extrinsic sonic muscles.

intro- (prefix) = inward.

introduced = any species accidentally or deliberately moved and released outside its natural range. When not established these are alien species, included under the term introduced.

introgression = the spread of inherited characters between species by hybridisation.

introgressive hybridization = the spread of inherited characters of one species to another species through hybridization.

intromittent fertilisation = internal fertilisation where the male deposits sperm in the female using a specialised structure such as the gonopodium.

intuotype = a specimen thought to be a nomenclatural type but not yet proven.

invalid = any name (available or unavailable) for a given taxon other than the valid name; a nomenclatural act not valid under the International Code of Zoological Nomenclature.

invalidation = the action of making a name invalid. May be brought about by suppression by the International Commission on Zoological Nomenclature.

invasive species = fish that damage the ecosystem into which they are introduced. See also alien.

invecked - misspelling of invected.

invected = having a border or edge comprised of semicircles, distally convex, e.g. the frilly lip margin of some fishes such as the cyprinid *Garra*. Opposite of engrailed.

inventory = a collection of data on natural resources and their properties.

invertebrate drift = aquatic and terrestrial invertebrates that float with the current and are often fed on by fishes.

invertivore = feeding on invertebrates other than insects.

investing bone = membrane bone (a bone which arises directly from connective tissue membranes without cartilaginous precursors. Includes dermal bones, as opposed to cartilage ones. Membrane bones are thin, laminar and located near the surface of the body. When the connective mesenchyme transforms into bone it does not differ histologically from bone which arose from cartilage. Also called achondral bone and covering bone).

inviolate name = *nomen inviolatum* (an inviolate name, all available names not subject to any sort of alteration from their originally published form, i.e. they were correct as originally published and need no correction or emendation).

invisible fish = an advertising stunt where a bowl of water was placed in the window of a store with a sign saying it contained an invisible fish. The idea was to attract customers. Sometimes a concealed fan produced ripples on the water. Apparently crowds gathered claiming they could see the fish. Also called Brazilian invisible fish.

involution = deep cell movement at the blastoderm margin in which the deep cell layer folds inwards and back on itself producing the germ ring and its two primary layers, the epiblast and hypoblast.

IO = abbreviation for infraorbital canal.

iodofor = a chemical used to disinfect eggs.

iodoform odour = a slightly irritating odour similar to iodoform found in some fish, typically confined to certain fishing grounds and seasons.

ion exchange = a process used in aquaria to treat the water, softening it or removing pollutants. An ion-exchange unit uses resins to alter water chemistry, conditioning tap water before use in an aquarium, removing nitrates, de-ionising and softening water. Different resin units are required for different chemical alterations.

ionic regulation = in freshwater fishes enabled by copious dilute urine and taking up salt; in marine fishes by drinking large quantities, producing small amounts of concentrated urine and excreting sodium salts.

ionic strength= relating to the mineral requirements in water for supporting the health of fishes residing in that water.

ionocyte = chloride secreting cell (a cell in the gills, especially along the bases of the secondary gill lamellae and the pseudobranchs when present, which excrete chloride, potassium and sodium ions in marine fishes. These cells maintain the osmotic balance from the loss of water via the gills and the necessity of drinking sea water).

IP = abbreviation for initial phase in diandric fishes (possessing two different types of males, a large, brightly-coloured and aggressive terminal phase (TP) and a smaller, drab and relatively non-aggressive initial phase (IP), e.g. in *Thalassoma lunare* (Labridae). The TP has priority access to food and spawning females. On the death or removal of a TP, the first-ranking IP becomes the next TP (after first checking the reef thoroughly to make sure the TP is gone)).

ipogean = the subterranean environment inhabited by "cave" fishes. See also hypogean and epigean.

ipsilateral = same side. Opposite of contralateral.

*ipso facto* = in the fact itself; obviously.

IQ = abbreviation for individual quota.

Iqaluit = a town on Baffin Island, Nunavut, Canada, meaning many fish.

iqf = abbreviation for individually quick frozen.

iridescent = having rainbow colours; shown by many fishes in life, rapidly fading on death.

iridocyte = a crystal of guanine in the dermis of fishes, a layer of which produces reflective silvery white or iridescent tones typical of fishes. Also called iridiophore.

iridiophore = iridocyte.

iris = the heavily pigmented anterior part of the choroid layer, *q.v.*, lying just internal to the cornea in the fish eyeball.

Irish trawl = a long-winged trawl with outriggers of wood or bamboo stepped on board the boat spread the wings apart.

iron chink = a machine used in canneries to remove the head, fins and guts of fish (derogatory, brought in to replace Chinese workers who cleaned Pacific salmon before canning). Also called Smith Butchering Machine after A. E. Smith of Bellingham, Washington who invented it.

iron fish = a comic book vessel shaped like a torpedo and also capable of flight.

irradiation = exposure of fish to ionising radiation from radioactive isotopes or an electron source. At 150,000-450,000 rads, over 90% of spoilage bacteria are killed and shelf life of fish is extended by about two weeks.

irrigation = watering of land artificially, often affecting fish populations as water is abstracted from rivers.

ISA = infectious salmon anaemia.

Isaac-Kidd midwater trawl = a trawl designed for catching small organisms, including fish, at great depth. Used by researchers.

isabelline = a dirty yellowish-grey colour, often included in dictionaries since it is purportedly based on Isabella, Archduchess of Austria, who refused to wash her underwear until her husband took Ostend. This he did but the siege lasted three years from 1601. When he finally succeeded, the garments were this colour. The word may in fact be from the Arabic izah for lion, thus "lion-coloured".

isallotherm = a map line connecting all points having the same temperature variation within a given time period.

ischiopubic bar = a straight and horizontal bar in cartilaginous fishes forming the pelvic girdle. The pelvic fins articulate at the acetabular surfaces. An iliac process extends from each end of the bar. In Elasmobranchii both halves of the pelvic girdle are fused into a single ventral puboischiadic bar.

ischiopubic cartilage = ischiopubic bar.

ischiopterygia = plural of ischiopterygium.

ischiopterygium (plural ischiopterygia) = pelvic fin (the paired fin which is located posterior, ventral or anterior to the pectoral fins (abdominal, thoracic or jugular in position). It functions to steer, brake and propel the fish and acts as a keel. In the pelvic fin ray count usually all the rays are counted except a small ray preceding the first ray and usually bound so closely to it so as to require dissection to be seen. In some fishes with reduced pelvics, the spine and the first ray may be bound together by a membrane and appear as one; both are counted, e.g. in Cottidae. Abbreviated as P2 or V).

iscotype = adelfotype (an unofficial term in nomenclature referring to a topotype (*q.v.*) collected by the original collector of a taxon but one not forming part of the type series).

isinglass = the glutinous or gelatin-like fluid prepared from the collagen of the outer layer of gas bladders of sturgeons or other fishes. Used in clarifying wines and beers, for jams and jellies, in printing inks and as an adhesive cement.

island wake = upwelling of deep waters through the meeting of ocean currents with an island.

islet = small island.

islets of Langerhan(s) = the endocrine part of the pancreas producing hormones and, in particular, insulin. Also called pancreatic islets.

iso- (prefix) = equal, same, duplicate.

isoamphicoelous = vertebral centra in which the restriction or narrowing lateral view is in the middle of the centrum, rather than anteriorly, e.g. in Cryptacanthodidae.

isobar = a map line connecting all points having the same barometric pressure.

isobath = a map line connecting all points having the same depth; bathymetric contour.

isobathytherm = a map line connecting all points having the same depth and temperature.

isobatic = said of a symmetrically forked caudal fin.

isobenth = a map line connecting all points having the same biomass.

isocercal = diphycercal (an internally and externally symmetrical tail fin. May be secondarily acquired from the homocercal condition by loss of the real caudal fin and the gaining of a new one from dorsal and anal elements, e.g. in Gadidae).

isocheim = a map line connecting all points having the same mean winter temperature or coldest winter month.

isochrone = a map line connecting all points having the same time of travel for contaminants to move through the saturated zone and reach a well.

isocon = a map line connecting all points having an equal concentration per unit area and time, e.g. salinity.

isocotype = isotype.

isodeme = a map line connecting all points having the same population density.

isodont = having teeth all of the same type, the usual condition in fishes.

isoflor = a map line connecting all points having the same number of species.

isogene = a map line connecting all points having same gene frequency.

isogenotype = an unofficial term in nomenclature for one of two or more generic names based on the same type species.

isogenotypic = adjective for isogenotypy.

isogenotypy = the condition of being an isogenotype.

isogeotherm = a map line connecting all points having same mean temperature on the earth's surface.

isogram = a map line connecting all points having the same anything. Also called isoline.

isohale = isohaline.

isohaline = a map line connecting all points having the same salinity.

isohel = a map line connecting all points having the same sunshine.

isohume = a map line connecting all points having the same relative humidity.

isohydric = a map line connecting all points having same pH.

isohyet = a map line connecting all points having the same rainfall.

isolated fish = a location in angling where fish are separated from open water, e.g. by a fallen tree, or in a cove.

isolation facility = part of an aquaculture facility used to prevent the introduction of disease or parasites, e.g. to maintain eggs from wild fish separate from those from hatchery stock.

isolecithal = eggs having little yolk evenly distributed throughout the egg, e.g. eggs of Petromyzontidae, Acipenseridae, Amiidae, Lepisosteidae. Also called homolecithal.

isolectotype = a duplicate specimen of a lectotype.

isoline = a map line connecting all points having the same anything. Also called isogram.

isolume = a map line connecting all points having same light intensity.

isometric growth = growth that occurs at the same rate for all parts of an organism so that its shape is consistent throughout development. See also allometric growth.

isoneotype = a duplicate specimen of a neotype.

isoneph = a map line connecting all points having the same cloudiness.

isonome = a map line connecting all points having same abundance of a species.

isonym = one of two or more names based on the same nomenclatural type.

isopag = a map line connecting all points having same number of days per annum during which ice is present.

isoparatype = a duplicate specimen of a paratype.

isopectic = a map line connecting all points where ice begins to form at the same time of the winter.

isopedine = an inner layer of compact lamellar bone found in the plates and scales of ostracoderms and placoderms and in ganoid scales of teleosts.

isophagy = predatory activity selective on prey items but not restricted to a single one.

isophene = a map line connecting all points having the same phenotype or variant.

isophot = a map line connecting all points having the same incident radiation.

isopistes = a map line connecting all points having the same arrival date of a migratory species.

isopleth = a map or graph line connecting all points of the same numerical value. Commonly used in determining yield-per-recruit. Also called isorithm.

isoprant = a map line connecting all points having the same expression of a given factor.

isopropyl alcohol (isopropanol) = used in some collections to preserve fish, usually at a concentration of 50% or 55%. Less inflammable than ethanol (ethyl alcohol) and not subject to stringent controls but may clear tissues and decalcify bones.

isopycnic = an isopleth of density. Constant or uniform in density.

isorithm = a map or graph line connecting all points of the same numerical value. Commonly used in determining yield-per-recruit. Also called isopleth.

isosmotic = pertaining to solutions that exert the same osmotic pressure.

isospondylous = referring to fishes having vertebrae behind the skull similar in form to the rest. Contrasts with Ostariophysans which have the anterior vertebrae modified into a Weberian apparatus.

isostatic = pertaining to the rise in land level after the melting of glaciers whose weight had depressed the land level.

isosyntype = a duplicate of a syntype not mentioned at the time of valid publication of a name.

isotac = a map line connecting all points having the same melting time of ice in the spring.

isotach = a map line connecting all points having the same wind speeds.

isothere = a map line connecting all points having the same mean summer temperature or warmest month.

isotherm = a map line connecting all points having the same temperature.

isothermobath = a map line connecting all points having the same temperature at a given depth of ocean.

isotonic = having a concentration equal to that of the environment.

isotype = 1) a type described from two species of the same genus.

isotype = 2) a form occurring in a variety of localities.

isotype = 3) a duplicate of a holotype from the single collection that contained the holotype.

isotypical = an unofficial term in nomenclature said of generic names, ones based on several congeneric but heterotypic species.

isotypus = isotype.

isovel = a map line connecting all points having the same velocity of water flow.

isozoic = having a similar fauna.

isthmal = of the isthmus, e.g. isthmal photophore of the paralepidid *Lestidium bigelowi*.

isthmus = strip of flesh lying between the gills on the underside of the head.

Italian = a grade of dried and salted cod prepared for the Mediterranean market, especially that of Italy (Newfoundland).

italic = a type face where the letters *slant*. Often used to indicate scientific names or words in another language especially Latin.

iteroparity = the condition of producing offspring in successive years or seasonal batches, as is the case in most fishes, *cf.* semelparous.

iteroparous = adjective for iteroparity.

ITQ = individual transferable quota (assigning a fixed share of the catch to each fisherman as a tradable right, one that can be sold or leased to others).

IUCN = International Union for Conservation of Nature and Natural Resources.

IUCN Criteria = criteria developed to assess the threatened status of species using numerical measures of populations, their levels, range, decline, etc.

IUU = abbreviation for illegal, unregulated and unreported fishing vessels.

IV = a row of ventral photophores running from the anterior end of the isthmus to the origin of the pelvic fin.

Ivlev's electivity index = electivity index (an index (E) showing the degree of choice a predator shows in its feeding behaviour, e.g. of a predator on plankton; E is derived from  $r_i - p_i / r_i + p_i$  where  $r_i$  is percent composition of plankter i in the gut contents and  $p_i$  is percent composition of plankter i in the plankton sample. Values for E range from -1 to +1 with -1 meaning complete avoidance, 0 meaning no active selection, and +1 meaning complete selection).

Izaak Walton = 1593-1683, author of "The Compleat Angler", first published in 1653 and the classical work on angling. A fifth edition in 1676 with Charles Cotton added material on fly-fishing.

## J

J = Jurassic, a geological period of the Mesozoic Era ca. 210-140 million years ago.

J-curve = a J-shaped growth curve that depicts exponential growth.

j-cut = a cut made through a skinned fillet from the neck end of the fillet, dorsal to and along the line of the pin bones (*q.v.*) towards the last pin bone and then curving sharply down to the ventral edge of the belly flap (*q.v.*). The pieces cut out are called j-cuts or pin bone trimmings to leave a j-cut fillet. This is the most expensive type of fillet.

J-net = a coastal stake net for salmon used in Scotland and England with the trap set to one side of the outer end of a leader wall of netting and so forming a J shape.

jaabard = jabbart.

jaager = jagger.

jabart = jabbart.

jabb = a fishing net, consisting of three or four strong rods, from 8 to 10 feet long, laid across each other in the middle, and gently bent upwards, till they are fixed at the ends to a large hoop, from 4 to 6 feet in diameter, which forms its mouth. On the inside it is lined with a narrow mesh netting to retain the fish and let out water (Scottish dialect).

jabbart = 1) a lean fish, especially a large, lean cod (Scottish dialect).

jabbart = 2) a fish out of season, such as a haddock in January (Scottish dialect).

jabber = the underjaw of a fish.

jack = 1) a male salmon (e.g. *Oncorhynchus*) that spawns after spending a year or two less in the sea than the majority of individuals of its species. It is smaller than the usual spawner.

jack = 2) a young member of the pike family (Esocidae).

jack = 3) a member of the family Carangidae, not specifically a young one. The family has about 140 species, primarily in marine waters.

jack = 4) to fish with a jacklight.

jack = 5) jack boat.

jack boat = a two-masted, decked vessel, schooner-rigged, 4.5-18.1 mt, used for various fisheries purposes.

jack fisherman = a man fishing with a seine in a jack boat (Newfoundland).

jacklight = a light, whether a simple burning brand or a high-powered lantern, used to attract fish to be netted or speared.

jacklighter = someone who uses a jacklight.

Jacobson downdrift = feeding slack into a fly line as the fly emerges downstream; imitates an emerging insect.

jadgear = a person who verifies that barrels of fish were of a standard size (Scottish dialect).

jadger = jadgear.

jadgerie = jedgerie.

jag = yaag (2) to buy up fish on the quiet which the seller is contracted to deliver to someone else (Scottish dialect). Also spelled yagg).

jager = jagger.

jager steamer = a steamer for the transport of herrings.

jagger = a hawker of fish (archaic). See also joust, jager, jaager, yaager and yagger.

jaguar shark = no such species. A mythical shark in the movie "The Life Aquatic" sought by Captain Steve Zissou, played by Bill Murray, after the shark eats his partner. The movie has a lot of oceanographic/scientific in-jokes, e.g. interns are treated as slaves.

Jamaican dogwood = Florida fish-poison tree (*Piscidia piscipula* (Fabaceae, pea family), also called fishfuddle tree. Not a member of the dogwood family. Seminoles in Florida used a powder made from its roots, bark, and leaves to stun fish. See also fish poison tree.

janglefish = to listen or search for music on the internet (slang).

janglefished = burnt out from listening to too much internet music (slang).

Jansson's Frestelse = Jansson's Temptation, a traditional Swedish Christmas meal, a casserole of potatoes, cream, onions and anchovy fillets in oil. The anchovies are cured in a slightly sweet brine and are less salty than other types.

Japanese canned fish pudding = ground fish flesh seasoned with salt, sugar and sweet rice liquor, then boiled or steamed.

Japanese cod trap = a modified type of box-shaped trap, knitted with artificial fibres (Newfoundland). It has a door which keeps the fish from swimming over the top of the walls and the entrance.

Japanese fish sauce = a sauce mad of small fermented fish, very strong and used as a flavouring and condiment.

Japanese fishing float = glass float (a hollow ball of glass once used by fishermen to support nets in various parts of the world, now replaced with modern materials such as aluminium and plastics such as styrofoam. Most numerous in the Pacific from Japanese fishing gear, still washing up on shore and now collectibles. The Japanese ones are mostly greenish from the long exposure of recycled sake bottles. Norwegian glass floats were egg-sized and used with hook and line. Also called glass fishing float).

Japanese style seining = tow dragging, a type of Danish seining.

Japanese trawl = a long winged trawl having detachable wooden or bamboo beams attached to the main bridle a short distance from the tips of the wings.

Jaubert plenum = a natural method of filtration for a reef tank using a plastic grid (called an egg-crate) to suspend a thick (8-10cm) layer of coral or aragonite sand above a 2 cm water-filled void called the plenum. The system helps in lowering of nitrate through the presence of denitrifying bacteria deep within the bed.

jaw length = upper jaw length (the distance from the anterior tip of the upper jaw to the posterior tip of the upper jaw. Sometimes miscalled maxillary length when the premaxilla enters into the upper jaw), and lower jaw length (measured from the anterior tip of the lower jaw to the posterior angle).

jaw-locking = aggression between two fish, usually males, that grasp each other by the jaws as a trial of strength. Sometimes jaw dislocation results.

jawed = the vast majority of fishes have jaws, actually modified gill arches and are termed Gnathostomata which also includes the amphibians, reptiles, birds and mammals.

jawless = fishes lacking jaws are vastly outnumbered by jawed fishes. The living Agnatha, hagfishes and lampreys, number about 108 species. This is a paraphyletic group and, as well as lacking jaws in contrast to the jawed fishes, also lacks pectoral and pelvic fins, has one or two semicircular canals, no scales, no bones, no vertebral centra but only a notochord, and pores rather than slits as gill openings.

Jaws = a movie directed by Steven Spielberg starring a mechanical great white shark named Bruce, purportedly after Steven Spielberg's lawyer, Bruce Ramer.

jecder = jadgear.

jecderie = treatment leading to the shrinkage of fish, as when dried in the open air (Scottish dialect).

jecdry = jecderie.

jellied = 1) said of watery non-firm flesh, e.g. in *Anarhichas denticulatus*, having a low protein content (less than 12%).

jellied = 2) a condition after spawning in some older fish, the flesh has too little protein and is watery rendering it unsuitable for sale.

jellied = 3) fish in jelly (fish cooked in acidified brine or vinegar, fried or smoked and then packed in gelatin, gelatin and pectin or aspic. Sometimes includes cucumbers, onions and spices).

jellied eels = pieces or steaks of eels cooked in brine or vinegar and salt with vegetables and seasonings and then packed in gelatin. Sometimes the fat or gelatin from the eel itself is sufficient to form the jelly. Eaten hot or cold and formerly a staple food for the poor in London. See also coller an eel.

jelly = jellied (strictly jellied is the adjective).

jellyfish = not fish but invertebrates (coelenterates of the Class Scyphozoa) with a saucer-shaped, translucent body.

jennie = 1) a young female salmon that matures precociously (earlier than other fish in its age-class).

jennie = 2) a casting line with two or three hooks tied together back to back used in poaching.

jenny = jennie.

Jenny Haniver = a figure formed from dried fishes, particularly skates, rays and mantas, by seamen and passed off as mermaids and dragons to the gullible. Dating back to at least the thirteenth century, some are still extant 600 years after they were fashioned. The name origin is unknown; haniver being perhaps a corruption of Antwerp, an ancient seaport.

jerk bait = a lure in angling worked by jerking or twitching the rod tip as the lure does not have much action on its own.

Jersey fish = cod caught and processed in Newfoundland by fishermen from the Channel Islands in Europe.

jersey fish = cod caught and cured in Newfoundland and Labrador by entrepreneurs from the Channel Islands (U.K.).

Jesus fish = the stylised symbol of a fish showing membership in the Christian religion. Often seen on the back of cars. May have a cross for the eye or the word Jesus occupying the central body of the symbol. See also vesica piscis (2).

jetsam = matter washed up on shore.

jetty = 1) a structure protecting a harbour or a bay from wave action or to direct and confine the stream or tidal flow to a selected channel. May provide a habitat for fish species. Also called breakwater or mole.

jetty = 2) also used, somewhat confusingly and incorrectly, for piers, docks and wharves etc. that do not protect from wave action or direct water flow.

jewellery = various parts of fish, usually bony, have been made into jewellery, e.g. otoliths as earrings.

Jewish housewife's disease = diphyllobothriasis (a parasitic, intestinal disease of humans caused by eating raw or lightly processed fish. The parasite is a tapeworm (*Diphyllobothrium*) and man is the definitive host, fish the intermediate host. Also called Scandinavian housewife's disease). The name arises from the tendency of preparers of gefilte fish to taste this dish before it was fully cooked.

jewfish = common name for *Epinephelus itajara* (Lichtenstein, 1822), changed to goliath grouper so as not to violate the tenets of good taste. See also squawfish.

jib = triangular pieces of netting attached to both sides of the upper and lower edges of the mouth of a trawl.

jiffy = a trade name and slang for a powered auger, a device used to drill holes in ice for ice fishing with nets or hook and line.

jig = 1) one to several bare hooks attached to a weighted line. The hook(s) may have a lead head (lead molded around the hook) and be dressed with, or have a skirt of, rubber, hair, silicone or plastic. Also called bucktail.

jig = 2) jig fishing.

jig = 3) a portable balance used to weigh dried cod or the platform on which cod are placed to be weighed (Newfoundland).

jig = 4) lured and hooked by a jig.

jig fishing = using a jig.

jig hook = a hook embedded in a lead weight (as a sinker) used without bait to catch fish by jigging.

jig mold = a hollow form of varied composition used to form a jig.

jig mould = jig mold.

jig 'n pig = a leadhead jig with a pork rind trailer. Also called fly'n rind.

jig-mold = jig mold.

jigarnaree = a y-shaped wooden structure with an iron bar across the top against which a hooked fish is jerked in order to unhook it quickly (Newfoundland).

jigger = 1) a jig for fishing; jigs are hooks or lures of various kinds which are jerked up and down in the water to attract and catch fish. May be carried out by hand or by mechanical devices. Also called gigger.

jigger = 2) an apparatus for setting gill nets under ice which bounces the end of the net from an entry hole to another hole a net's distance away.

jigger = 3) meshed walls at the entrance to salmon traps to turn back fish trying to escape.

jigger = 4) the outer, heart-shaped container of a fish trap.

jigger fish = cod caught with an unbaited hook, usually under 18 inches long (Newfoundland).

jigging = imparting the up and down or side to side movement of a jig.

jigging ground = a shoal area in the coastal fishery of Newfoundland with abundant bait fish.

jigging machine = an electronically operated device to catch cod on lines baited with artificial lures.

jigging rod = a very heavy spin casting rod used to fish heavy metal jigs near the sea floor against strong currents.

jighook = jig hook.

jill = a female salmon that returns from the ocean to spawn one or more years before full-sized adults return.

jilson = gilson (wire tackle for emptying the cod end of a trawl).

jinglefish = janglefish.

jink = a failure to catch fish (Newfoundland).

jinker-fish = a cod left in a boat overnight (Newfoundland).

jinket = junket.

jitterbug = an old type of topwater lure with a large metal lip, making a gurgling sound on retrieval.

job = to fish for eels with worms strung on worsted (English dialect).

jobstick = a spreader at the end of a fishing line for carrying the thinner lines to which the hooks are attached (Scottish dialect). Originally made of whalebone.

joey = a small mackerel (*Scomber scombrus*).

John Dory = *Zeus faber*, a fish having an oval spot on each side, reputedly the fingermarks of St. Peter left when he picked up the fish to take the coin from its mouth. Haddock (*Melanogrammus aeglefinus*) also have these spots and are also said to be the fish St. Peter picked up. Since neither species is a freshwater one, this is ichthyogeographically untenable.

johnboat = a squarish, flat-bottomed wooden rowboat with a square bow and stern and low and straight sides. Now made in aluminium and fibreglass. Used by 2-3 anglers at a time, being up to 24 feet long.

joint enterprise = bilateral fishing agreements similar to joint ventures.

joint venture = 1) collaborative fishing operation usually involving two companies from different countries.

joint venture = 2) a partnership between foreign and local fishers.

joint venture = 3) strictly, a joint-stock company formed by combining capital from one or more firms. This provides opportunities for trade in fishery products and services.

jointing point = cross-over point (junction of two threads in knotless netting).

jolly boat = a small boat hoisted at a ship's stern and used as a workboat in harbours. From the Dutch jolle, meaning a small yawl.

jolting = an alarm movement of parental Cichlidae that attracts fry to the parent. The head snaps to one side and pelvic fins flick downwards.

Jonah and the fish = Jonah is the character in the Hebrew and Christian bibles who was swallowed by a fish (later changed to a whale). Jonah is on a ship heading to Tarshish, fleeing a mission to proclaim judgment on Nineveh at God's order, when God summons a great storm, and the ship's crew throw Jonah overboard in an attempt at appeasement. A great fish, sent by God, swallows Jonah and he remains in its belly for three days and three nights. He repents for his disobedience and calls upon God for mercy, whereupon God speaks to the fish, which vomits out Jonah safely on dry land.

Jordan's Rule (or Law) = 1) fish develop more vertebrae in cold environments than in warm ones.

Jordan's Rule (or Law) = 2) the closest relative of a species are found immediately adjacent to it but isolated by a geographical barrier.

jouder = over-boiled fish or meat (Cornish dialect).

journal = a serial publication; scientific works are usually published in journals of various names, content size, nationality, language, extent in time, etc.

jouster = 1) a female hawker of fish, usually on foot. See also jagger.

jouster = 2) jowter.

jowder = jouder.

jowding = jowsting.

jowl = the fleshy part of a cod's head (Newfoundland).

jowl-man = a man engaged in processing cod in a fishing stage, cutting the sides of the head (Newfoundland).

jowler-killer = an energetic, skilled and successful fisherman, particularly successful master of a fishing boat.

jowling = jowsting.

jowster= jouster (1).

jowsting = selling or hawking fish.

jowter = a mounted seller of fish (archaic). Also called jouster.

jubilee = a sporadic mass shoreward movement of marine fishes and other animals. May result in some cases from a shoreward movement of oxygen poor water which forces the fish into shallower water.

juicing = painted fish (aquarium fishes that have been artificially coloured by injection with a dye, dipping in dye or by feeding with dyed food. This marketing ploy fades after several

months. Fatality levels are high and campaigns to ban this process have been mounted. See also GloFish).

jug fishing = an angling system where 10 or fewer floats are used, each marked with the angler's name and license number, and each with a single line attached and not more than one common hook.

jugal = a dermal bone below the eye, the second in the circumorbital series, to which the adductor maxillaris muscle attaches its mesial surface. Also used by some authors for the supramaxilla, q.v. and the first suborbital bone or lachrymal, q.v.

jugal pitline = a character of Actinopterygii where the jugal (or second suborbital bone) sensory canal is absent and represented by pitlines only.

[juglone](#) = a piscicide (5-hydroxynaphthoquinone) used in Japan and made from the roots and fruits of *Juglans mandshurica* (Juglandaceae). Other piscicidal plant chemicals include callicarpone, huratoxin, ichthyothereol, inophyllolide, justicidin, maingayic acid, rotenone, and vibsanine, all q.v.

jugostegalia = the name given to the numerous rib-like osseus supports in the outer ventral walls behind the branchiostegals of the branchial chamber of the eel, *Myrophis*. Not regarded as homologous with branchiostegals and considered as structural supports of the prolonged branchial cavity. Other authors regarded them as homologous, defining them as those secondary, multiplied, overlapping and free (from the hyoid arch) branchiostegals found in certain anguilliforms. The term accessory branchiostegal rays is preferred by some authors to jugostegalia, although uncertain as to their homology. Characteristic of the anguilliform families Echelidae, Ophichthidae and Neenchelyidae. Also called jugostegal rays.

jugostegal rays = jugostegalia.

jugular = relating to the "throat" the ventral surface ahead of the pectoral insertion. Said of pelvic fins lie in front of the (insertion of the) pectoral fins.

jugular vein = a small vein from the lower jaw emptying into the common cardinal vein, q.v.

Julian calendar = the day following 4 October 1582 of the Julian calendar was designated 15 October 1582 of the Gregorian calendar; the 10 days being dropped in order that the vernal equinox would fall on March 21. The Gregorian calendar was not adopted by England until 1752, but is now in general use throughout the world. However it was adopted only in the twentieth century in Russia and so collection dates on museum samples can appear under a different date when subsequently revised.

jumbo = term applied to large specimens of commercial species.

jump bait = jump lure.

jump in = to put in place the head of barrel of salt herring.

jump lure = a weighted lure whose action is caused by movement of the rod or reel in the form of a jerk or jump.

jump the shark = the moment when a TV show begins to decline, is desperate for ratings or goes over the top; and, by extension, anything else such as relationships. Based on an episode of *Happy Days* when a character (Fonzie) literally tried to jump a shark on water skis.

jump-fishing = fishing for schooling fish that are feeding on the surface.

jumper = 1) fish feeding at, and breaking, the surface.

jumper = 2) tuna, so-named in Newfoundland along with pilot whales and porpoises for leaping out of the water.

jumper net = a small trap net staked close inshore, supported by three stakes and secured at the land and sea ends, and free to rise and collapse with the tide. Fished singly on beaches with steeper gradients than where fly nets, *q.v.*, are used.

junior = younger, as used in nomenclature for example.

junior homonym = see homonyms (a junior homonym is the later published of two homonyms, i.e. the later published of two or more identical but independently proposed names for the same or different taxa (a preoccupied name)).

junior objective synonym = of two synonyms based on different nomenclatural types, the later established.

junior synonym = see synonym, junior (the junior synonym is that with the later publication date of two or more different names applied to one and the same taxon).

junk = a Chinese sailing vessel, also used in fishing.

junket = a long wicker basket for catching fish (English and Scottish dialect).

Jurassic = a geological period of the Mesozoic Era ca. 210-140 million years ago. Abbreviated as J.

justicidin = justicidin A and B is a plant piscicide of Taiwan made from whole *Justicia hayatai* var. *decumbens* (Acanthaceae). Other piscicidal plant chemicals include callicarpone, huratoxin, ichthyothereol, inophyllolide, juglone, maingayic acid, rotenone, and vibsarine, all *q.v.*

justified emendation = in nomenclature, the correction of an incorrect original spelling.

justifiable emendation = justified emendation.

juvenile = a young fish essentially similar to the adult but not sexually mature (Hubbs, 1943). In some cases refers to a stage unlike the adult in appearance.

juvenile period = this period begins when fins are differentiated and the temporary organs of the larval period, q.v., are replaced by definitive organs. This transition from larva to juvenile may involve extensive changes in anatomy. Some larval organs persist while some organs only fully develop later in the juvenile period, e.g. scales, intromittent organs. Juveniles have a characteristic and distinct pigmentation and show rapid growth. The juvenile period ends when gametes mature.

juvenile transportation = collecting migrating juvenile fish and transporting them around dams using barges or trucks.

## K

K = Cretaceous, a geological period of the Mesozoic Era ca. 140-65 million years ago.

k-cut = knot cut (a cut of a netting piece just beyond the knots where the two cuts are cut at a time).

k-selection = a life history strategy characterised by slow development, low mortality, late maturity and reproduction, repeated spawnings but sometimes at intervals of several years, large body size and long life span. An adaptation to a relatively constant environment.

K-value = a chemical index as a measure of fish freshness, the ratio (often multiplied by 100) of the sum of inosine and hypoxanthine contents to the sum of the concentration of adenosine triphosphate (ATP) and all degradation products expressed on a molar basis. ATP is converted to inosine and hypoxanthine after the death of the fish.

ka = an abbreviation for thousands of years ago.

kaae = keeow.

kaavie = kavi.

kabayaki = split, boned, steamed eels or sauries which are then broiled with frequent dipping in tare (a thick sauce made from soy sauce, sugar, sweet rice liquor, etc.). Often sold canned (Japan).

kabbelow = cabelew (cod or pike hung and salted for a few days but not thoroughly dried (Scottish dialect). Also spelled cabylou and kabbelow).

kabbi = cabbie (a small cod caught near the shore, not big enough for salting down and selling, but of a nice size for eating fresh (Scottish dialect). Also spelled kabby).

kabbilow = cabelew (cod or pike hung and salted for a few days but not thoroughly dried (Scottish dialect). Also spelled cabylou and kabbelow).

kabby = kabbi.

kade = cade (an older name for a cask used to pack and measure fish. A cade of herring comprised 720 fish, a cade of sprats at Aldborough was a thousand).

kaen = to split cod (Scottish dialect).

kaf = 1000 acre-feet. Used in reservoir management in the U.S.A.

kag buoy = keg buoy.

kain fish = cane fish (rent for fishing, paid in kind (Northumberland dialect). Also spelled cain, kain and kane fish).

kainer = the overseer responsible for payment of kain fish.

kairomone = a type of pheromone produced by fish and used to attract a mate. Predators may also be attracted. Other organisms respond to the fish kairomone too, e.g. water fleas escape predatory guppies more easily, undergo morphological changes (longer helmets) and reproduce at a smaller size.

kaisie = cassie (a straw or rush woven basket for carrying fish. Also casey, casie, caisy, caisie, caysie, cazzie, caiss, kazie, kazzie, kazy, keizie and keize).

kakaban = an artificial nest-like structure made from natural material such as sticks, coconut fibres or from artificial material such as unraveled ropes on which some species of fish spawn. Many kakabans are added to ponds at spawning times and removed with the egg mass for controlled fertilisation.

kakuni = diced skipjack tuna or tuna meat cooked in a mixture of soya sauce and sugar. Usually preceded by the name of the fish (Japan).

Kalbfisch = trade name for hot-smoked pieces of porbeagle (*Lamna nasus*, Lamnidae) in Germany.

Kalkwasser = literally lime water (chalk water or calcium water, in German). Water containing dissolved calcium hydroxide at pH about 12.0 used to add inorganic calcium to aquaria for maintenance of calcium, pH and alkalinity. It is best dripped into the aquarium or added to top-up water as an overdose can easily kill the fish.

kamaboko = a heat-pasteurized, Japanese fish cake made from minced and kneaded fish, with starch for thickening, and sugar, salt and monosodium glutamate for flavoring. Of a rather rubbery texture. See also fish gel.

kameril = cameral.

kane fish = cane fish (rent for fishing, paid in kind (Northumberland dialect). Also spelled cain, kain and kane fish).

kaner = the overseer responsible for payment of kane fish.

kangal fish = *Garra rufa* and *Cyprinion macrostomum* (Cyprinidae) in Turkish hot springs in the Kangal area which clean dead skin fragments from humans with psoriasis. Also called doctor fish and nibble fish.

kap(p) = removing the head and guts of fish (Shetland Isles dialect).

kapi = fermented fish paste (Thailand).

Kán gait = a mode of locomotion in fishes characterised by large lateral body movements and synchronisation of tail-beat frequency to vortices formed by an object in the water. The cost of locomotion is reduced for the swimming fish by its use of environmental vortices and the body of the fish acts as a self-correcting hydrofoil.

kappa = a child-sized creature of Japanese folklore found in water, often with scaly skins, webbed hands and feet, smelling like fish and able to swim. They are mischievous troublemakers and there is an extensive folklore associated with them.

karal = a cotton drift net with bamboo floats, operated from a canoe (India).

karavala = whole or gutted fish, washed, salted and sun-dried (Sri Lanka).

karez = a term for a qanat in Central Asia (an underground water channel constructed in alluvial fan material to tap the water table and provide a constant flow of water. Mostly found in the Middle East and a habitat there for fishes. Called foggara in North Africa and falaj in Arabia).

karlen book = the book in which a fish catch was registered (Scottish dialect). Also spelled carlin book.

karstic = pertaining to irregular limestone strata, often with caves, underground streams and sinks, often inhabited by a specialised fish fauna.

katadromous = see the preferred spelling catadromous (running down; those fishes which spend most of their lives in freshwater and which migrate to the sea to reproduce, e.g. *Anguilla*).

kater-fish = fish claimed by a landlord in Caithness, Scotland from crofters when they returned with a catch.

katla jal = karal.

katsuo-bushi = dried meat of a skipjack tuna formed into sticks. The fish is cut longitudinally into four pieces, de-boned, boiled and simmered, then dried, the shape adjusted, and defatted by enzymatic action of moulds (Japan). Used as condiment.

kavel = kavle.

kavi = a sinker on a fishing line (Scottish dialect). Also spelled kaavie or caavie.

kavl = kavle.

kavle = 1) cavil (to extract a hook from a fish mouth by means of a notched stick (Scottish dialect). Also spelled kavl, kavel, kavvel, kavkle).

kavle = 2) the rearmost space in a boat where the fishing line is hauled in over the gunwhale and where fish are removed from the hooks. Also spelled kavl, kavel, kavvel, kavvle).

kavlin tree = a stick notched at one end and used to take the hook out of a fish's mouth (Shetland Isles dialect).

kavvel = kavle.

kavvle = kavle.

kawr = a coastal lagoon (Arabic). Also spelled khawr.

kay = key (2).

kayak = a portable boat, originally skin-covered, with a small central opening in which the boater is ensconced, propelled by a double-bladed paddle. From the Inuit word qayaq.

kayak fishing = use of a kayak to catch fish. Equipment is similar to that used in larger and more stable boats but somewhat specialised to allow for the smaller size of the kayak and the possibility of tipping. Larger fish will tow the kayak through the water, part of the thrill of this form of fishing.

kazie = cassie (a straw or rush woven basket for carrying fish. Also casey, casie, caisy, caisie, caysie, cazzie, caiss, kazzie, kazy, kaisie, keizie and keize).

kazunoko = dried and salted herring roe sacs, with a crisp texture, a Japanese delicacy.

kazy = cassie (a straw or rush woven basket for carrying fish. Also casey, casie, caisy, caisie, caysie, cazzie, caiss, kazie, kazzie, kaisie, keizie and keize).

kazzie = cassie (a straw or rush woven basket for carrying fish. Also casey, casie, caisy, caisie, caysie, cazzie, caiss, kazie, kazy, kaisie, keizie and keize).

keb = to fish from a boat for flatfish with four hooks hung from the end of a weighted wooden cross (Lancashire dialect).

kebab = a skewer of fish grilled over a fire.

keddle net = a form of stake net in England authorised under a mediaeval royal charter. Used in mackerel fishing.

kedger = a fisherman (archaic).

kedgeree = boiled rice, fish (usually smoked haddock), eggs, butter and herbs. A traditional British breakfast dish. The original kedgeree in India did not have fish mixed in, but as a side dish. Also spelled kitchery.

kedgy = lumper (a helper in the cod fishery of Newfoundland, either at sea or on shore).

keel = a ridge or carina.

keel hook = a wet fly hook designed such that its point is uppermost and the shank is bent and in-line with the hook point. The bend drops the centre of weight of the hook so it rides barb upwards. Less likely to catch on vegetation or the bottom.

keel sinker = a keel-shaped weight to prevent line twisting when trolling.

keelboat = long, narrow boat with a sharp stern and bow, and with running boards on each side.

keelbone = the bony structure forming the primary roof of the mouth cavity and consisting of the vomer-parasphenoid (basisphenoid)-basioccipital. It connects the ethmo-vomer block to the cranial vault of the skull.

keeling = 1) large cod, *Gadus morhua*, but may refer to other species like haddock, *Melanogrammus aeglefinus* (English and Scottish dialect). Also spelled keillen, keilling, killin and killing.

keeling = 2) small cod, *Gadus morhua* (North Yorkshire dialect).

keeling = 3) a large fish out of condition.

keen fish = flesh from the head of a fish (Scottish dialect). Also spelled kinn fish.

keeow = inserting the points of fish hooks in the snoods or passing the snoods over the hooks and round their shafts, to prevent entanglements (Scottish dialect).

keep = a reservoir for fish by the side of a river (Lancashire dialect).

keep sack = a soft nylon sac used to keep live fishes in whilst angling.

keep under salt = to keep covered with salt after the curing process has been completed.

keeper = 1) a loop near the grip on a fly rod to which the fly and its hook can be attached when moving through trees, bushes or grass so that the hook does not become entangled.

keeper = 2) any fish that conforms to an established minimum length or weight and so can be legally kept.

keeper = 3) a trophy fish.

keeper = 4) a gamekeeper, who checks that your keeper is a keeper.

keeper = 5) any fish large enough to be eaten.

keeper = 6) kipper (2).

keeper ring = a small ring on a fishing rod near the reel used to attach the hook and tackle when the gear is being carried or moved.

keepnet = 1) a net lacking knots and supported with plastic or metal hoops, designed to hold fish caught by angling, usually in contests so the fish can later be weighed and released, or to keep fish fresh before transport and eating.

keepnet = 2) any net used to retain or hold fish, even on a commercial scale. See also keipnet, cap net, kelp net or kipp net.

keerdrag = a small trawl with an oblong mouth, the bottom and sides of which are composed of an iron rod for weight and the upper edge of wood for buoyancy. The net tapers posteriorly for 7-8 feet to a round opening. Mesh size decreases posteriorly. The tow rope is attached by a bridle with three connections, one to the middle of the wooden beam and two to the middle of each side. The net is operated over the stern of a row-boat.

keethin(g) = kithing.

keething sight = the view a fisherman gets of ripples in the water which reveal the movements of a fish (Scottish dialect).

keg = 1) a measure of volume or quantity, e.g. a keg of herring has 60 fish.

keg = 2) a small cask, usually 45.5 litres or less in capacity.

keg buoy = a buoy formed from a keg, with a flag on a pole. Used to mark the position of a trawl line or fish trap (Newfoundland). Also called kag buoy.

keillen = keeling.

keilling = keeling.

keipnet = keepnet (2) (Newfoundland).

keith = 1) a bar laid across a river to prevent salmon from getting further up (Scottish dialect).

keith = 2) keth.

keize = cassie (a straw or rush woven basket for carrying fish. Also casey, casie, caisy, caisie, caysie, cazzie, caiss, kazie, kazzie, kazy, kaisie and keizie).

keizie = cassie (a straw or rush woven basket for carrying fish. Also casey, casie, caisy, caisie, caysie, cazzie, caiss, kazie, kazzie, kazy, kaisie and keize).

keling sound = the swimbladder of a cod used as glue (Scottish dialect). See also killing or kyling sound.

kelk = 1) a separate ovum or particle of roe in the spawn of a fish (Scottish and English dialect). Also spelled kilk.

kelk = 2) the bag containing the spawn of the haddock (English dialect).

kelk = 3) the testicles.

kellick = killick.

kelp net = see keepnet (2) (Newfoundland).

kelper = a small boat used in the Pacific Northwest to fish inshore rocky and kelp areas with strong currents.

kelt = a spawned out or spent *Salmo salar* or other salmonid up until the time it enters salt water. Also called dropback or downriver in British Columbia.

Kelvin sounding machine = a machine used to calculate water depth in fathoms. A lead weight was lowered on a wire and the depth recorded by the apparatus. See also lead line.

kemeral = cameral.

kemple = a sauce made from cod (Scottish dialect).

kenar = kainer.

kench = 1) a container in which fish are salted.

kench = 2) a pile of fish in a rough pyramid, with a base slightly over a metre, in the hold of a ship. The weight of the fish pressed the pickle (*q.v.*) out of the salted flesh.

kench cure = salmon, cod and related species salted in alternating layers of split fish and salt and arranged so the resulting fluid (pickle) can drain away. Also called round cure, round salted fish, bulk cure, salt bulk and bulk salted fish).

kenner = 1) a water bailiff (Scottish dialect).

kenner = 2) the lead man in a salmon boat who directs the fishing (Scottish dialect). Also spelled kinner.

kental = quintal (*q.v.*) (Newfoundland).

Kentucky reel = a quality fishing reel made in Kentucky up to about 1940, including fly reels and saltwater reels, now collectors items.

kepper = 1) a spawning fish or kipper (Northumberland dialect).

kepper = 2) a landing net (Scottish dialect).

keps = fishing tackle comprising a lead weight and two curved wires, from the end of which are suspended lines with hooks and bait (Cumbria, England).

keratin = a waterproof, structural protein forming horny parts of fishes, e.g. breeding tubercles, lamprey teeth.

keratinization = the process of becoming fibrous or horny as in the protein keratin.

keratobranchial = ceratobranchial (a long, deep, endochondral bone in the middle portion of the gill arches between the epibranchials and the hypobranchials. There are usually 5 pairs of ceratobranchials, absent in some *Anguillidae*, *Polypterus* and *Calamoichthys*. The fifth pair of ceratobranchials are modified in Cypriniformes and Siluriformes into a strong, tooth-bearing bone called the inferior pharyngobranchial bone).

keris = the late postlarval stage of unicornfishes (*Naso*, Acanthuridae). It moves inshore from the open ocean for transformation to the juvenile stage.

kernel = nucleus (the core or primordium of an otolith; no longer used).

kerplunk = a technique used by dolphins to drive fish out of hiding, e.g. from sea grass beds. A dolphin lifts its tail and lower body out of the water and crashes it down on the water surface, causing a loud splash and trail of bubbles. The bubbles startle the fish and flush them out.

keriorrhoea = an uncontrollable, oily, orange discharge from the human rectum caused by eating escolar (*Lepidocybium flavobrunneum*) or oilfish (*Ruvettus pretiosus*). These fish cannot metabolise wax esters occurring naturally in their diet and the oils accumulate in muscles (as high as 18–21%). Headaches, nausea and vomiting may also result. Consumption of these fishes is banned in some countries.

keta caviar = light salted roe of *Oncorhynchus keta*.

ketch = a boat used for fishing and coast work. Also spelled catch.

ketchup = originally a Chinese pickled fish sauce (from ketsiap, the Chinese for sauce or the brine of pickled fish - sources vary).

keth = ripples on the water surface marking the presence and movements of fish (Scottish dialect). Also spelled kethe, keith or keyth.

kethe = keth.

kettle = 1) a kettle for boiling whole fish, whence kettle of fish.

kettle = 2) a relatively deep and small part of a water body.

kettle = 3) the deepest part of a fish pond usually near the monk, q.v.

kettle hole = a depression found in glacial deposits where a piece of ice from a retreating glacier became embedded in soft glacial till or drift. These holes are often filled with water making a small pond or lake.

kettle of fish = 1) a bad state of affairs; a very difficult and annoying situation; something to be considered or reckoned with.

kettle of fish = 2) literally a large cauldron in which salmon are boiled with salt by the side of the river, e.g. at Berwick-upon-Tweed.

kettle-fish = fish suitable for boiling.

keudie = kudi.

key = 1) a tabulation of characters used to identify a species. Two rubrics form a couplet, the usual arrangement of keys. Each couplet gives an alternative set of characters leading to the species identity or to the next couplet. Also called identification key, q.v.

key = 2) a small, low island near the mainland composed mostly of sand and/or coral. Also spelled cay, kay.

key = 3) a channel cut in ice in spring to facilitate ice flow such that ice jams and flooding does not occur. Explosives may be used and these can kill fish.

key = 4) church key (a name for the small key-like device supplied with canned fish such as sardines used to roll open the can. Mainly used for the differently-shaped beer openers and hence church key is sarcasm).

key character = a diagnostic character used in a key.

key classification = artificial classification (a classification based on characters selected for their utility and not indicative of phylogenetic relationships).

key scales = those scales used in scale counts for identification and description of fish species, e.g. lateral line scales.

key species = a species used to describe or assess the use or quality of a habitat or given area.

keylock = killick.

Keys-Willmer cell = chloride secreting cell (a cell in the gills, especially along the bases of the secondary gill lamellae and the pseudobranchs when present, which excrete chloride, potassium and sodium ions in marine fishes. These cells maintain the osmotic balance from the loss of water via the gills and the necessity of drinking sea water).

keystone predator = the dominant predator or the top predator that has a major influence on community structure.

keystone species = a species that is essential to the food web of an ecosystem, e.g. *Boreogadus saida* in the Arctic; a species whose loss from an ecosystem would cause a greater than average change in other species populations or ecosystem processes.

keyth = keth.

kg = kilogram(me) (2.2046 lb).

KH = buffering capacity, temporary or carbonate hardness, measured in degrees (K is from the German word karbonate). KH makes up a component of GH, q.v., so boiling will also reduce GH slightly. One degree KH is equal to 17.9 mg/l CaCO<sub>3</sub>. The degree symbol may be replaced with a d, e.g. 2 dKH).

khawr = a coastal lagoon (Arabic). Also spelled kawr.

KHV = abbreviation for koi herpes virus.

kibling = kibbling.

kibbling = cut-up fish used as bait (Newfoundland).

kick boat = a one-person fishing boat comprised of a seat between two pontoons allowing the legs to dangle in the water and propel the boat by kicking with the aid of scuba fins, by use of paddles or by a small electric motor.

kick-and-glide = a rapid darting locomotion involving 3-5 rapid strokes of the caudal fin, expulsion of water from the opercular openings, and a rapid stroke of the pectoral fins, followed by folding of the fins to the body for the glide, e.g. in frogfishes.

kicker = a larger bass caught in a tournament that helps increase the angler's total catch.

kicking the cod = rugby in Newfoundland.

kicknet = the use of a small net (often a dipnet) placed downstream of rocks or gravel to catch fish disturbed by kicking over rocks or shuffling feet in the gravel.

kid = a large box into which fish are thrown as they are caught on New England fishing vessels.

kidden = a decoy light for salmon (Cornish dialect).

kiddle = a basket set in the sluice of a dam or weir to catch fish. See also keddle, fine kettle of fish and pretty kettle of fish.

kidney = an organ of excretion and osmoregulation. See also nephridia, archinephros, pronephros and mesonephros.

kidney disease = bacterial kidney disease (a bacterial infection with *Renibacterium salmoninarum* or *Corynebacterium* sp. affecting salmonids, usually when temperatures are falling. The disease may be chronic or acute and has no treatment. Causes swelling of internal organs (oedematous, grey and corrugated kidneys with off-white lesions) and haemorrhages. Lesions may occur also in the liver and spleen and muscle contractions occur. External symptoms may be absent or include exophthalmy, skin darkening, abdominal swelling, and skin ruptures and vesicles. Also called Corynebacterial disease and Dee's disease).

kidney lead = a lead weight, kidney-shaped used in handline fishing.

kidney spoon = a fishing lure with an oval or kidney shape.

Kieler sprotten = hot-smoked and ungutted fat sprats taken from Kiel bay and processed in or near Kiel (Germany).

kilk = kelk (1).

kill = 1) a small fast-flowing stream in the Dutch settlement areas of New York state (hence killifishes, Fundulidae).

kill = 2) a die off of fishes within a relatively short period due to the onset of man-caused or, more rarely, natural factors, e.g. pesticide related mortalities in the Mississippi River, the red tides in the Gulf of Mexico. See also winterkill and summerkill.

kill-devil = an artificial bait used in fishing, especially for pike.

kill-out = slaughter of some or all the fish in an aquaculture because of disease.

killick = an early form of anchor made from a wooden frame enclosing large stones, with four flukes at the bottom, one of which would dig into the sea floor. Still extant locally in Maritime Canada. Also called keylock, kellick. See also granny.

killin = keeling.

killin kite = a cod belly, in the sense that this is the chief sustenance.

killing = keeling.

killing sound = the swimbladder of a cod used as glue (Scottish dialect). See also kyling sound and keling sound.

kilogram = kilogramme.

kilogramme = 2.2046 lb. Abbreviated as kg.

kilometre = 0.6214 mi. Abbreviated as km.

kimchee = a Korean mixture of fermented cabbage and onions, strongly seasoned with horseradish, garlic, red pepper and ginger. Some preparations contain fish.

kimlets = the plump pieces taken from the jowls of a cod (north Yorkshire dialect).

kin fish = the fleshy part of the cheek of a fish (Shetland Isles dialect).

kinch = the young fry of fish (Gloucester dialect).

kinesis = 1) the ability of parts to move or flex against each other.

kinesis = 2) change in rate of random movement of an organism in response to a stimulus, or to a change in the intensity of a stimulus.

-kinesis (suffix) = movement.

kinethmoid = a small median bone in the snout dorso-posterior to the premaxillaries in cyprinoids (between the nostrils). Replaces rostral bone, now restricted to primitive bony fishes. Aids in protrusion of the premaxillaries. Also called moveable ethmoid.

kinetic line = a sharp angle between the skull and cheek region in Sarcopterygii, thought to be kinetic to some degree.

king = the senior migratory fisherman from England in a harbour (Newfoundland). Used to forecast the weather in Norway as a dried king cod is suspended by a thread from

king cod = an Atlantic cod (*Gadus morhua*) with a deformed skull, the head having a ridge or crown. Used to forecast the weather in Norway, where a dried king cod suspended by a thread from the ceiling points in different directions, indicating the weather over the next few days. Actually, humidity changes cause the twisted woollen thread to unravel or tighten slightly, turning the cod head.

king herring = 1) a herring of a blood-red colour which reputedly acts as pilot to a school of herrings. If caught, it is always thrown overboard by the fishermen, as keeping it would bring bad luck.

king herring = 2) a species of Chimaeridae that raids herring schools.

king of the herrings = 1) *Regalecus glesne*, the oarfish (Regalecidae).

king of the herrings = 2) king herring.

king sling knot = a knot used in angling to tie crank baits to the line, having a loop through the eye on the lure. It allows the lure to work freely and be more lifelike. Various websites have animated steps showing how to tie this knot.

king trap = a large cod trap (Newfoundland).

king's fish board = a stall in Chester at which the quality of foreign fish was tested, and at which the Mayor, as Clerk of the Market, bought such fish as he chose for the city's use.

king's gap = a space between nets to allow salmon to ascend to the spawning grounds in thirteenth century Cumberland, England. A royal regulation which stated the gap had to be far enough apart to allow "a sow and her pigs to pass".

kingfish = 1) any species of fish notable for its size. A commercial name not used as in official common name lists as too confusing.

Kingfish = 2) the nickname of Louisiana governor Huey Long (1928-1932); the name was taken from the character "Kingfish" of the "Amos 'n' Andy" radio show.

Kingfish = 3) the NATO name for an air-fired Soviet anti-ship and strike missile, the Raduga KSR-5.

kingo no funi = Japanese expression, loosely translated as goldfish crap in reference to the faecal cast (*q.v.*, faeces hanging from the anus), meaning a sycophant or hanger-on.

kings, fishy death of = 1) a surfeit of lampreys, the meal that reputedly killed Henry I of England in 1135. The flesh is said to be fatty and not easily digested.

kings, fishy death of = 2) Edward IV of England died in 1483, from a chest infection, caught while fishing on the River Thames. Pneumonia resulted and, with pleurisy, finished him off although rumour at the time thought poison was the cause.

kinkin = a small barrel equal to a quarter of a tun (252 gallons or 954 litres) used for fish among other products (Scottish dialect).

kinn fish = keen fish.

kinner = kenner.

kinocilia = plural of kinocilium.

kinocilium (plural klinocilia) = a motile cilium, especially one that occurs alone at the end of a sensory hair cell of the inner ear among numerous non-motile cilia. The more numerous, shorter cilia are called stereocilia.

kintal = quintal (*q.v.*) (Newfoundland).

kinosphere = personal space; shark threat displays are often initiated when their kinosphere is violated.

kinunot = a Philippine specialty, shark meat sauteed in coconut milk.

kip = 1) to catch fish by means of line and chop-sticks (*q.v.*) (English dialect).

kip = 2) a male salmon, *Salmo salar*.

kip (noun) = 3) a bundle of fish (archaic).

kip (verb) = 4) to tie up fish in a bunch or kip.

kipe = 1) a osier basket used in fishing.

kipe = 2) to catch fish by means of a basket trap.

kiplin = 1) the palates, gullets, sounds or other perishable parts, when cured, of the cod (East Anglia dialect).

kiplin = 2) to cut up a cod in order to cure it (East Suffolk dialect).

kipp net = see keepnet (2) (Newfoundland).

kippeck = a small bunch or string of fish (Shetland Isles dialect). See also kip (3).

kipper = 1) a split, salted and cold smoked herring; sometimes a salmon. May be artificially coloured, and is sold chilled, frozen, canned or made into a paste. Also called kippered herring.

kipper = 2) a male salmon or sea trout during or just after the spawning season. Usually a salmon seriously out of condition with up to half its weight lost (English dialect). Also spelled keeper.

kipper = 3) to die, slang based on the definition above.

kipper = 4) kepper.

kipper = 5) to poach fish.

kipper catcher = a poacher of salmon during the close season.

kipper fair = a gala day at Newton-on-Ayr, Scotland, in August when the close of the salmon-fishing season was celebrated with a treat of kippered (i.e. smoked) salmon and ale.

kipper fillets = pieces of kipper fillets packed in cans.

kipper nose = someone with a hooked or beaked nose.

kipper snack = canned kippered herring fillets in a can (Norway).

kipper time = the close season for salmon.

kipper watcher = one who watches for salmon during the close season.

kipper-split fish = a fish split along the backbone.

kippered herring = kipper (1).

kippered products = in the U.S.A. refers to hot smoked, dyed and brined fish.

kippering = 1) making kipper from herring.

kippering = 2) cold smoking (U.K.).

kippering = 3) hot smoking (U.S.A.).

kippers = 1) plural of kipper.

kippers = 2) kids in parents' pockets, eroding retirement savings.

kiprock = a small bundle of fish hung up (Shetland Isles dialect).

**kirbed** = a hook offset to the right when viewed from the top of the hook with the eye towards the observer, *cf.* reversed. A hook that is not offset is called straight or flat. Kirbed is from Charles Kirby reputedly a superb hook maker in Izaak Walton's day. Kirbed or reversed hooks are all the same to fish but fishermen have strong preferences. Offset hooks are more likely to strike home on fast-biting fish while straight ones work better with slow-biters and chewers. Also flatfish mouth anatomy makes offset hooks more effective. However offset hooks lack the strength of straight ones and can be harder to set in bony or muscular mouths. Offset hooks tend to rotate if trolled or if in a current which may be either an advantage or not.

**Kirby hook** = a hook having a round bend, the point angled to the right of the shank. A reversed hook has the point to the left.

**kit** = a small wooden barrel used for packing pickled salmon.

**kitback** = kitpock.

**kitch** = straw or rush package for herrings.

**kitchen god** = the Vietnamese kitchen god returns to heaven to report on the family and its secrets at the end of the lunar year. While a bribe would be inappropriate, Ong Tao can be helped by giving him a carp to rid home on. Traditionally, Vietnamese families release a fish in ponds and lakes each year.

**kitchen-ready fish** = 1) fish ready prepared for cooking. Also called pan-ready.

**kitchen-ready fish** = 2) fish specially prepared to make a good presentation. Also called pan-ready.

**kitchery** = kedgeree.

**kite** = a shearing device on a false headline used to lift the true headline and/or to scare fish down into the mouth of the net.

**kite fishing** = 1) using a kite to get a rig out beyond the reach of smaller, undesired fish; a mechanism releases the rig into the water and the kite is retrieved.

**kite fishing** = 2) a flat and square kite with a live bait attached and fished on the surface without any line being visible. Used for sailfish. Also baited hooks and spider-web baits are used and skipped along the surface to entice a fish such as bonito to snap at them.

**kite rig** = the equipment used in kite fishing.

**kiting** = using the body depth and erect fins to guide the fish across a current. Also used by a fish when hooked.

**kithing** = surface movements on the water indicating the presence of fish (Scottish dialect). Also spelled keethin(g).

**kitpock** = the stomach of a fish, especially that of the cod (Orkney dialect).

kitpoke = kitpock.

kitten = a basket in which fish are packed on the beach at Folkestone to be sent by train to London and elsewhere (Kentish dialect).

kittle = 1) to bring forth young, usually of cats, but also fish (British dialect).

kittle = 2) catching trout by tickling (*q.v.*).

kiwa = ornamental carp or koi, having a sharp definition between different colours. The most valuable fish have the most clearly defined lines.

klak = a fishing ground near the shore, as opposed to the haaf or deep-sea fishing grounds (Scottish dialect).

klak fishing = handline fishing (Scottish dialect).

kleek = cleek (1) a barbed hook used to land salmon; a salmon gaff (Ayrshire dialect). Also spelled click, cleik, kliek and cleeque).

kleek = cleek (2) to hook, catch up or fasten on a hook or to fish out with a hook. Also spelled click, cleik, kliek and cleeque).

klepp = clip (a gaff or strong iron hook with a wooden handle, used for landing fish (British dialect). Also spelled clep, clipe, klip and klepp).

kleptoparasitism = stealing food.

kleptotype = in taxonomy, a stolen type or portion of a type. The term is unofficial and presumably includes outright theft, specimens loaned and not returned, and specimens mistakenly retained in a collection other than the rightful one.

kliek = cleek.

klip = clip (a gaff or strong iron hook with a wooden handle, used for landing fish (British dialect). Also spelled clep, clipe, klip and klepp).

klipfish = split, salted and air-dried cod (*Gadus morhua*) (Norwegian klippfisk).

klondiked = klondyked (2).

klondyked fish = 1) fresh herring sprinkled with ice and salt for a few days preservation.

klondyked fish = 2) bulk purchasing of such fish as herring and mackerel as over-the-side sales from factory ships anchored offshore. Also spelled klondiked.

km = kilometre (0.621 mi).

kn = knot (speed in nautical miles per hour, 1.0 INM/h, 1.15 m.p.h. or 1.8532 km/h).

knab = a resinous fir root, burned in a cruisie or iron basket, to give light for poaching fish (Scottish dialect).

knap = a shoal or bank on fishing grounds (Newfoundland). Also spelled nap.

knephopelagic = the middle pelagic zone of the sea from about 30 metres down to the lower limit of light penetration.

knip = three small fish tied together (Scottish dialect).

knit up = to make or repair a net; to knot twine into meshes to form a fish net (Newfoundland).

knitting = making or repairing a fish net (Newfoundland). Also called netting.

knob = a good spot for fishing (Newfoundland).

knock soe = pounded bait (Scottish dialect).

knoll = a small reef within the lagoon or on shallow shelves.

knot = 1) speed in nautical miles per hour, 1.0 INM/h, 1.15 m.p.h. or 1.8532 km/h. Abbreviated as kn. Originally measured by throwing a log overboard and measuring distance by a knotted line.

knot = 2) a fold in fishing line as a means of connecting lines, weights, lures, hooks, etc. There are numerous types.

knot = 3) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for eels.

knot cut = a cut of a netting piece just beyond the knots where the two cuts are cut at a time. Also called k-cut.

knot disease = a disease characterised by small knots formed in the skin of fishes. Found in *Cyprinus carpio* and caused by the protozoan *Myxobolus exiguus*. Also called pimple disease.

knot picker = a pointed tool used by anglers and fishermen to unpick knots in line.

knot strength = the ability of a fishing line to resist weakness caused by knots - the type of knot is important.

knotless knot = a knot formed by whipping line to a hook without any knot being used. Various websites have animated steps showing how to tie this knot.

knotless net = nylon net made without knots using twisted yarn knitted together thus reducing scale loss and stress in fish.

knotless tapered leader = a fly fishing leader of monofilament.

knotted leader = a fly fishing leader made up of sections tied together to make a tapered leader.

knotted net = a net where the mesh is formed by knotting the twines using a single or double weavers' knot or reef knot.

known-stock fishery = a fishery taking place in an area and during a time where only fish of a certain stock are present.

knownon (nonon) = a unit of ignorance or nonsense.

Kochfischwaren = hot marinated fish (fish flesh marinated in hot vinegar or acidified brine at 80-90°C. Packed in jelly or sauces)(Germany).

kohaku = ornamental carp or koi, being white fish with a red pattern.

koi = 1) ornamental carp (*Cyprinus carpio*) especially bred over centuries for colour patterns and body form, each variety having a name in Japanese. The Japanese word is nishikigoi and koi simply means carp. Contests for determining the most ornamental individuals ended with the losers being eaten.

koi = 2) the climbing perch, *Anabas testudineus* (Anabantidae).

koi herpes virus = a viral infection of both ornamental koi and fish-farmed common carp (*Cyprinus carpio*) and therefore of considerable effect on economically valuable populations. First isolated in 1998, there is no test for it during the asymptomatic period which can be lengthy. Abbreviated as KHV.

koinobori = carp streamer (a carp-shaped wind sock flown in Japan on a national holiday called "Children's Day" (5 May). They are flown in the breeze to honour sons and to hope they grow up strong and healthy. The wind socks are made by drawing carp patterns on paper or cloth and are a few centimeters to meters long, the longest having been 100 metres).

kokanee = 1) a beer from British Columbia.

kokanee = 2) a freshwater, landlocked *Oncorhynchus nerka* (Salmonidae).

kona head = an artificial trolling lure used for catching fast-swimming pelagic species such as swordfish and marlin. It resembles a squid.

kosher fish = those fish conforming to Jewish dietary laws. Fish without scales are not kosher. Also included as non-kosher are some groups which have scales in an ichthyological sense, e.g. sharks and rays (Elasmobranchii), sand lances (Ammodytidae) and eels (Anguilliformes) ([www.kashrut.com/articles/fish/](http://www.kashrut.com/articles/fish/), downloaded 1 December 2003).

krab of fish = freshly caught salmon cut into pieces and thrown into boiling water. An old method of serving salmon on the Tweed River in Scotland.

krampies = dish formed from the liver of fish (Shetland Isles).

krappin = fish liver mixed with oatmeal as a nutritious meal (Shetland Isles dialect). See also variant spellings using c instead of k.

krenal = crenal (adjective for crenon, strictly the organisms in an area of headwater springs but also used in the sense of crenal zone, *q.v.*).

kreppo = krappin.

kriesel tank = a circular aquarium designed for delicate species - it has no sharp corners, organisms are kept away from the filtration system and the water circulates slowly.

krohnus stage = the larval stage of Macrouridae.

kron-sardiner = 1) small herring used as raw material for preserves, mostly in cans. The herring is eviscerated and headed and thoroughly washed (Sweden).

kron-sardiner = 2) small herring eviscerated, headed and vinegar cured for export (Norway).

Kronsardinen = marinated small herring or sprat, mostly from the Baltic Sea, sometimes with spices, sugar and other flavouring agents (Germany).

Kronsild = Kronsardinen.

kroppen = krappin.

krroppin = krappin.

krugie = bait for fish, often a worm used for trout (Shetlands and Orkneys dialect).

krupuk = ground shrimp or fish mixed with tapioca flour, salt and seasonings. The mix is steamed in moulds, cooled, sliced and sundried, becoming crisp when deep-fat fried.

kryal = cryal (adjective from cryon, the organisms of a glacial stream or sea ice community).

kuddie = kudi.

kudi = oil exuded naturally from decaying fish livers (Scottish dialect). Also spelled kuddie, keudie and variants.

kun = a giant and mysterious fish of northern seas in Chinese mythology. It can turn into a giant bird known as peng.

kunka = bati (an Indian cup used to measure carp fry or spawn, usually about 130-170 c.c.), containing up to 2.7 million eggs.

Kupffer's vesicle = a small ventro-caudal epithelial pocket formed mid-ventrally posterior to the yolk cell or its extension as the blastopore narrows in embryonic fish.

kusaya = horse mackerel (*Decapterus* spp.) dried after soaking in special salt water and preserved for years (Japan).

kwark = kwerk.

kwarkie = kwerk.

kwerk = part of the throat of a fish used as bait (Scottish dialect). Also spelled kwark, kwarkie, quark, quarkay, quarkie and whark.

ky. = abbreviation for 1000 years.

kyarlin = 1) a line or net that has not caught any fish (from the witch whose spell binds the nets or lines, the spell being broken only when the first fish has been caught) (Scottish dialect). Also spelled cyarlin.

kyarlin = 2) the first fish caught on a line or in a net (Scottish dialect). Also spelled cyarlin.

kyarlin = 3) fines imposed on fishermen whose nets or lines catch the fewest fish, the various fines being pooled to provide a feast for the whole crew (Scottish dialect). Also spelled cyarlin.

kyling sound = killing sound.

kype = 1) the lengthened and hooked lower jaw of mature males in certain species of Salmonidae, a secondary sexual characteristic. May also refer to both jaws so elongated and occasionally to the upper jaw alone.

kype = 2) putt (a tapering basket used in making fish weirs on the Wye and Severn rivers of England. Putts are placed in groups of six or nine between pairs of stakes, each group between two stakes is called a puttcher. Also called butt).

kyphosis = dorso-ventral curvature of the vertebral column in lateral view; usually a result of disease.

kyphoscoliosis = lateral curvature of the spine with vertebral rotation. Associated with an antero-posterior hump in the spinal column.

kyro-ichthyozoonosis = a viral disease in certain Brazilian fishes of unknown cause.

kyte = 1) the stomach of a fish (English and Scottish dialect).

kyte = 2) roe (English and Scottish dialect).

kythe-sight = the view a fisherman has of the motion of a salmon by marks in the water.

L

L = litre (33.81 fl oz, 0.264 gal).

$L_1$  = total length at formation of first winter annulus in the scale or otolith.

$I_1$  = total length at formation of first winter annulus in the scale or otolith as determined by back calculation from the formula  $I_1 = Lv/V$  where v is the linear dimension of the scale within the first winter annulus and V is the linear dimension of the scale.

$L_\infty$  = asymptotic length (length at infinite age).

*l.c.* = *loco citato*.

L/min = litres per minute (0.264 gal/min).

L-number = a numbering system used to identify shipments of Loricariid catfishes used by the aquarium magazine DATZ (Die Aquarien und Terrarienzeitschrift). The number may refer to species as yet unidentified or to populations of the same species. It is retired once the fish is identified by a scientific name. See also LDA.

L-zone = that part of a micro-increment of an otolith that is light in transmitted light or is an elevated region when acid-etched and seen with a scanning electron microscope. It has less organic matrix and more calcium carbonate than the D-zone, *q.v.* Also called incremental zone.

labbered = fish mature enough to ripple the stream.

Laberdan = beheaded and gutted, salt-cured cod (Germany).

labial = pertaining to the lip; viewed from the lip or outside of the mouth (opposite of lingual).

labial cartilage = one of the extra cartilages along the jaws of Elasmobranchii.

labial fold = the lip fold; the fold behind corners of the mouth in Elasmobranchii which provide slack in the skin for protrusion of the jaws.

labial furrow = labial fold.

labile = capable or propensity to undergo change; said of characters used in describing fishes.

labium = lip or any lip-like structure.

laboratory fish = a fish species used for experimental purposes in a laboratory setting as opposed to those used in aquaculture, the aquarium trade, etc.

Labrador floater = a fishing schooner (Newfoundland). See Labrador schooner.

Labrador cure = heavily-salted, kench-cured cod with 17-18% salt and 42-50% moisture. Also called Labrador soft cure and Labrador fish.

Labrador fish = Labrador cure.

Labrador fishery = a branch of the inshore cod fishery carried out from early summer to fall by migratory Newfoundland fishermen in schooners or from shore stations.

Labrador slop = salt bulk of inferior quality.

Labrador retriever = used by fishermen to bring nets to shore by pulling on the floating corks.

Labrador schooner = a Newfoundland migratory fishing vessel of from 30-200 tons carrying out the Labrador coastal cod fishery during the summer.

Labrador soft cure = Labrador cure.

Labrador voyage = the enterprise or period of fishing by Newfoundland migratory cod fishermen in Labrador waters.

Labrador whaler = a double-ender (pointed bow and stern) dory carried on a Labradorman. Used to handline for cod, returning to the Labradorman throughout the day to unload their catch for cleaning and salting in the hold.

Labradorman = 1) a 40-60 ton schooner from Lunenburg County, Nova Scotia that fished the bays of the Labrador coast in summer. Each schooner carried 4-6 Labrador whalers on deck.

Labradorman = 2) a migratory fisherman carrying out the cod fishery in Labrador coastal waters.

labriform = wrasse-like, used to denote a form of locomotion using the pectoral and caudal fins only. See also anguilliform, carangiform, ostraciform, thunniform.

labyrinth = 1) the internal ear of fishes. Comprises a pars superior composed of three semicircular canals, *q.v.*, and the sac-like utriculus, and a pars inferior composed of two sac-like structures, the sacculus and lagena

labyrinth = 2) barricade (a barrier used to lead fish into an enclosure, e.g. fyke net, pound net, etc.). Japanese labyrinths may be complex mazes up to a kilometre long.

labyrinth organ = a much folded suprabranchial accessory breathing organ found in Anabantoidei. Formed by vascularized expansion of the epibranchial of the first gill arch. Used for respiration in air. Also called accessory breathing organ.

labyrinthi membranacei = plural of labyrinthus membranaceus.

labyrinthodont = a type of tooth with a complex infolding of dentine (an outer enamel layer may also be present) forming a labyrinthine pattern that can be seen in cross-sections. Found in Crossopterygii and primitive Amphibia. A pulp cavity is not always present, and the entire tooth may be filled with folded dentine.

labyrinthus membranaceus (plural labyrinthi membranacei) = membranous labyrinth (the semicircular canals and the appended otosac. The canals and chambers are filled with

endolymph and surrounded by perilymph. The membranous labyrinth is enclosed in cartilage in Cyclostomata and Elasmobranchii, in several bones in Teleostomi, the bony labyrinth).

labyrinthus osseus = bony labyrinth (the skeleton of the membranous labyrinth, composed of otic bones anteriorly, occipital bones posteriorly and dermal roof bones dorsally).

lace = 1) fine plastic tubing wrapped around the shank of a hook to give the appearance of a segmented body.

lace = 2) the round stick used to form the mesh in making fishing nets (Dorset).

lace hoods = lastridge.

lachrimal = lachrymal.

lachrymal = the first, paired, dermal bone in the circumorbital series, the largest. Also called preorbital and also spelled lachrimal, lacrimal.

lachrymal groove = a small groove on the lower edge of the snout just above the upper lip, formed from a fold of skin under the edge of the lachrymal bone.

lacinate = incised with divisions coarser than serrae; used to describe the free margins of the scales of some fishes.

lacrimal = lacrymal.

lacrymojugal = a paired dermal bone formed from the fusion of the first two infraorbitals, e.g. in *Latimeria* and Homalopteridae.

lacuna = space, cavity or gap. e.g. in bony or cartilaginous tissues in which osteocytes or chondrocytes are found. Lacunae are usually interconnected and connected to capillaries via canaliculi through which the cell extends processes to interact with other cells for respiration, nourishment, etc.

lacustrian = lake-dwelling.

lacustrine = pertaining to or inhabiting lakes or ponds.

lacustrine anadromous = fish seeking a lake or pond in which to spawn and coming from a marine or brackish environment.

ladder = a series of steps with flowing water and pools enabling a fish to circumvent an obstruction such as a dam by leaping from step to step. Also called fishway, fish pass.

ladder count = a method used to estimate spawner abundance by counting adult salmon returning upstream to spawn as they pass a fish ladder.

lade = to empty water out; a technique where a dammed water body is laded out to enable fish to be caught easily.

lade net = a long handled net on an iron hoop for taking fish out of the sea or a well.

lady = a title for the masters of the second and third English fishing vessels to reach a harbour in Newfoundland, carrying with it certain privileges for the season. See also fishing admiral.

lady day = lady day fish (Newfoundland).

lady day fish = catch of cod brought in at the end of the summer fishery on 15 August or , Lady Day (Newfoundland).

lag = 1) a catch of fish (Scottish dialect).

lag = 2) an inclination to bite in fish (Scottish dialect).

lagena (plural lagenæ) = the lower, posterior and outer chamber of the inner ear projecting from the sacculus, probably responsible for hearing. It is well-developed only in Cypriniformes. Contains an otolith, the asteriscus or lagenolith.

lagenæ = plural of lagena.

lageniform= bottle-shaped.

lagenolith = astericus (the otolith in the lagena. Also called asterisk. The largest otolith in Cyprinidae but small in other fishes).

Lagerstätten = mother lode, deposits rich in fossils, in complete fossils and in variety of fossils (German but used in English texts).

lagg = a ring of shallow water surrounding a peat mat, often dominated by sedges.

laggen = walking in the water with bare feet or splashing in the water, the latter applied to fish as well as children (Cornish dialect).

lagging of tide = the periodic retardation in time of the high and low water due to changes in relative positions of the moon and sun.

laggy = leggy.

lagoon = 1) a shallow pond or elongate channel separated from the open ocean by a sand bar or reef, or by a narrow outlet, with little or no freshwater input.

lagoon = 2) a settling pond for wastewater treatment.

lagoon slope = the back reef on a barrier or atoll reef.

laid back = dished out (a stream bank with an angle greater than 90 degrees).

lake = 1) a large, standing, inland body of water, usually fresh but may be saline; technically at least 8 ha. Also called loch or lough.

lake = 2) a stretch of water in a field of icebergs.

lake = 3) a small stream of running water (obsolete).

lake = 4) a channel for water (obsolete).

Lake Chargoggagoggmanchauggagoggchaubunagungamaugg = the Massachusetts lake name means "Englishmen at Manchaug at the Fishing Place at the Boundary". Also called Lake Webster.

lake classification = a broad definition of a lake's character, e.g. oligotrophic, mesotrophic, eutrophic, q.v.

lake drainage = the catchment area of a lake.

lake fishery = the fishery that takes place in a lake.

lake of water = lake (2).

lake-frith = the close-time for fishing in a stream (obsolete).

lakeland = an area abundant in lakes.

lakelet = a small lake.

laker = a fish living in or taken from a lake.

lakerda = salted, dried fish such as Atlantic bonito (*Sarda sarda*) cut in slices and salted in barrels or boxes of 10 kg (Greece, Turkey and Armenia).

laksi fisher = lax fisher.

laksi gert = a salmon weir (Scottish dialect).

laky = of or pertaining to a lake.

lam net = splash net (any net into which fish are driven or led by frightening them. The water surface may be thrashed with sticks, boat sides struck, water splashed, etc.).

lamella (plural lamellae) = a layer, a thin plate, e.g. the plates in the sucking disc on the head of Echeneidae; in gills the transverse vertical plate on the gill filaments through which capillaries run (sometimes called secondary lamellae).

lamellae = plural of lamella.

lamellar layer = fibrillary plate (the fibrous lamella or disk forming the base of a teleost scale).

lamina (plural laminae) = a small thin plate or layer.

lamina circularis = Canestrini's scale (a bony process or plate at the base of the first (unbranched) and second (first branched) ray of the pectoral fin of male *Cobitis*).

lamina circularis ossea = lamina circularis.

lamina pinnae ani = the bony plate which unites the distal ends of the central anal fin rays in spawning *Mallotus*.

laminae = plural of lamina.

laminar = blade-like, layered, stratified.

laminate = in layers.

laminated block = a block of fish fillets, frozen, skinless, boneless, weighing usually 7.4 kg and used as the basis for fish fingers or sticks, and portions. It may include some minced fish or be entirely minced fish.

Lammas drave = the summer herring fishery on the Fife coast of Scotland, peaking in August.

lampara = a net similar to, but much smaller than, a purse seine with no pursing action used for catching schools of small fish attracted to lights, e.g. anchovy and pilchard. There is a central spoon-shaped section and two lateral wings and the net is usually operated from a small boat. The rapid retrieval of the lead line does close the bottom of the net but it is not a true purse.

lampern leap = a trap for the lampern, *Lampetra fluviatilis*, in English rivers; presumably a form of fish basket.

lamphedrin = a saliva-like fluid having anticoagulant haemolytic and cytolytic properties, secreted by the buccal gland in lampreys (Petromyzontiformes).

lamprell = see lampron.

lampret = see lampron.

lamprey = forms part of or all the name of various recording groups and records, presumably attracted by the yuck factor in using the name of this organism, e.g. the 1995 album titled "Lamprey" by Dutch indie band Bettie Serveert, Loxsly's song "Lamprey Eels", etc.

lamprey au sang = a recipe for lampreys where the blood is kept aside, the lamprey is scalded and the skin removed, a buttered pan is lined with vegetables, herbs, spices and garlic, lampreys and red wine are boiled in the pan for 12 minutes, leek and bacon are cooked in a buttered pan, drained lampreys are added to a pan alternating with the leeks and simmered, and the blood is poured over the dish after being made into a sauce with butter and flour. Usually served with fried bread.

lamprey bake = lamprey pie.

lamprey pie = an old dish now out of favour; Lord Berkeley in Queen Elizabeth I day used to send such pies as presents to judges and other distinguished people.

lamprey stock = a wooden cylinder used for catching lampreys.

lampicide = a poison for killing lampreys.

lampron = a stage in the growth and development of a lamprey, followed by a lampret, lamprell and finally a lamprey (obsolete). Some definitions give these names as simply variants of lamprey.

lamwash = landwash.

lancaster = an iron spacer between bobbins, *q.v.*, with connecting chains to the fishing line, used in groundropes.

lance = a place name for shallow, shelving and sandy coves where lances (*Ammodytidae*) are found (Newfoundland).

lance seine = a seine with fine meshes for catching schooling lance (*Ammodytidae*) (Newfoundland).

lanceolate = spear-shaped, broad at the base and tapering to a point.

land = landed but usually in the sense of a fish caught and played on hook and line.

land of the flying fish = Barbados, as flying fish migrated between the island and the outflow of the Orinoco River from Venezuela, a rich feeding ground.

land fish = a person out of place, like a fish on land.

land frozen fish = fish frozen on shore.

land shark = 1) a person on the prowl for members of the opposite sex.

land shark = 2) a boarding house keeper, in the sense of someone cheating seamen.

land shark = 3) a usurer.

land shark = 4) one who seizes land by craft or force.

land shark = 5) a customs house officer.

land-bridge = 1) a connection between adjacent land masses, forming a dispersal or migration route for freshwater fishes or a barrier to marine fishes. May form and recede over time.

land-bridge = 2) a young island formed when sea level rises or by erosion. Usually less than 10,000 years old.

land-crab = a person who is not a fisherman (Newfoundland).

land-locked = 1) living in waters shut off from the sea, or in waters with access to the sea though the fish are non-migrating populations; said of fish that have migratory populations elsewhere.

land-locked = 2) a water body enclosed or nearly so and thus protected from the sea.

land-stick = a pole, being the shore attachment of the leader from a large bag net.

landed = caught and brought to land or to shore.

landed catch = the total catch in a fishery less discards; the fish brought ashore. Also called retained catch. See total catch.

landed weight = landings.

landing limit = trip limit (the maximum catch that a boat is allowed to bring back from any one trip. Usually agreed between fishers and the government so that fishing can be carried out through a longer season and/or more people have a chance to fish).

landing net = a net on the end of a pole used to scoop up a large fish caught by angling. Pole length, net size and net shape vary.

landing price = price for a fish or a fish product at the landing point, not taking account of any transportation or handling costs (same as farm gate price in aquaculture).

landing site = location at which boats land their catch. A landing site may be the same as the homeport or base port but it can also be different. Recording of fishing activities tend to be conducted in the vessel homeport or base port, while sampling and recording of catches and species composition, landing prices, etc., are usually undertaken at landing sites.

landings = the number or weight of fish or fish products unloaded at a dock by commercial fishermen or brought to shore by recreational fishermen for personal use. Landings are reported at the points at which fish are brought to shore. Note that the catch is different and may include discards. Also called landed weight.

landings data = information on the amount of fish caught and landed in a given time period.

landman = landsman.

Landolt's club = in eyes of primitive fishes, the thick, club-like upper tip of the bipolar cells present only in retinas with mostly cones. Its function is unknown.

landshark = 1) a person on the prowl for members of the opposite sex.

landshark = 2) a boarding house keeper, in the sense of someone cheating seamen.

landshark = 3) a usurer.

landshark = 4) one who seizes land by craft or force.

landshark = 5) a customs house officer.

landsman = 1) a member of a fishing crew or team who processes the catch on shore (Newfoundland).

landsman = 2) a migratory fisherman from Newfoundland who fishes from a shore station on the Labrador coast.

landwash = the sea-shore between high and low tide marks, washed by the sea (Newfoundland). Sometimes used for a lake or river shore.

lane = a slow-moving, meandering stream or its bed (Scottish dialect).

langie = lengie.

lanted = said of fish which escape from a fish pond down a runnel, when there is not sufficient water to carry them to the river (Yorkshire dialect for left behind).

lantern net = a lantern-shaped net with a bamboo frame placed over a sighted fish and then released by hand to catch it. The lower opening is the larger and the fish is removed by the smaller upper opening. Similar to a cover pot or plunge basket (*q.v.*) but using netting on a framework. The netting may be a trammel net to entangle the fish.

lap = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for cod.

lap tail = in fish preparation, more than one inch of the flesh portion near the tail, folded in.

lapette = lappet.

lapilli = plural of lapillus.

lapillus (plural lapilli) = the otolith in the utriculus of the pars superior. It is held in a vertical position against the cells of the utricular macula which is innervated by the anterior branch of cranial nerve VIII (the stato-acoustic nerve). Movements of the lapillus send signals to the brain and help the fish to maintain equilibrium. It is usually very small but is the largest otolith in Siluridae. Also called utriculith.

lappet = a small fleshy lobe, e.g. on the upper lip of the blenniid *Cirripectus*; a flat tab of skin on the head of *Avocettinops*. Also spelled lapette.

lapstrake = clinker (a form of seaworthy boat construction built with planks overlapping the one below).

*lapsus* = *lapsus calami*.

*lapsus calami* (singular and plural) = the type of error made by a slip of the pen. The misspelling of a name by an author rather than a printer's error. May be important in nomenclature.

laptail = in commercial preparations, the portion of the fish flesh near the tail that has been folded over. Ranges from slight (no more than 10% of the length of the fish near the tail folded in), though moderate, to high (up to 50%).

large = 1) a grade of dried and salted cod (Newfoundland). Large fish are dry, sound, smooth, well salted and over 18 inches while extra large are from 21 to 24 inches long.

large = 2) a size of commercial fish, e.g. cod, salmon.

large marine ecosystem = a region of the ocean comprising coastal areas and estuaries to the seaward boundary of continental shelves and seaward margins of coastal current systems. Can be 200,00 km<sup>2</sup> or more. Such a region is characterised by its environmental conditions, by productivity and by trophically linked populations.

large pit organ = free or superficial neuromast (sense organs found in the epidermis. See also canal neuromasts, and small pit organs).

large-meshed = pertaining to a fishing net having big meshes.

large-scale fishery = a fishery having significant socio-economic import.

larin = a silver fish hook used as money in southern Iran.

Larsen midwater trawl = a wingless, midwater trawl with a square mouth towed between two boats. Also called atom trawl, Larsen trawl, floating trawl, Larsen two boat trawl, two boat pelagic trawl.

Larsen trawl = Larsen midwater trawl.

Larsen two boat trawl = Larsen midwater trawl.

larva (plural larvae) = a developmental stage well differentiated from the juvenile and intervening between the times of hatching and of transformation (Hubbs, 1943). Young after hatching are markedly different from the adult. Divisible into prolarva and postlarva, e.g. leptocephalus larva of eels; ammocoete larva of lampreys; krohnii larva of Macrouridae.

larvae = plural of larva.

larval period = the time from the beginning of exogenous nutrition (feeding externally) until the formation or ossification of the axial skeleton and until the undifferentiated median fin fold is differentiated or no longer apparent. Some embryonic organs persist and special larval organs develop which are later replaced by different organs of the same function or disappear when their function is no longer needed. This period is absent in some fishes, e.g. Salmonidae and extremely long in others, e.g. 1-3 years in Anguilliformes. This period has two phases: protopterygial from the transition to exogenous feeding and the beginning of differentiation of the embryonic median fin fold (appearance of lepidotrichia buds and dorsal and anal fin

outlines), and pterygiolarval from the beginning of the differentiation of the median fin fold until it is entirely differentiated or no longer apparent. An alevin phase is found in species that have no larval period and lasts until complete scalation or ossified spines, e.g. in Salmonidae, equivalent to the elver phase in Anguillidae, the metamorphic phase in Elopidae, the tholichthys phase in Chaetodontidae, the acronurus phase in Acanthuridae and the exterilium phase in Brotulidae.

larval stage = larval period.

larval type = neotype (1) in nomenclature, an unofficial term for the type of the larva of a species-group name).

larval type = neotype (2) in nomenclature, an unofficial term for a type specimen which is the larval stage of a species).

larvicultural fish = fish that eat larvae, e.g. *Gambusia* spp. that eat the larvae of malarial mosquitoes.

larviparous = bearing fish larvae rather than eggs, e.g. *Sebastes* (Scorpaenidae).

larvivore = a larva eater; paedophage.

larvivorous = larvae eating; paedophagous, e.g. *Cynolebias*, *Notobranchius* and *Poecilia reticulata* (Cyprinodontidae) consume mosquito larvae.

larvophile = mouth-brooding Cichlidae that lay their eggs on the substrate, the female picking up the fry when they hatch and keeping them in her mouth, e.g. in *Geophagus* and *Sarotherodon*.

lash = lask.

lask = a slice cut off the tail of a mackerel used as bait in pollack or mackerel fishing (Cornish dialect).

lasking = keeping near shore, a fisherman's term (Cornish dialect).

last = 1) an old Saxon weight of 2 tons used for various items including fish; the Great Yarmouth last counted 13,200 herrings.

last = 2) a round stick used to form the mesh in making nets.

last = 3) a wire frame or pattern used in knitting or making a cast net.

last = 4) a hundred fish, with several extra added in to allow for broken or damaged fish.

last spring = a salmon fry.

last vertical blood vessel = the most posterior blood vessel extending from the dorsal aorta to the nephros and used as a reference point in anguilliform larval descriptions.

lastridge = the line along which the top and bottom parts of a trawl are locked together. Also called lace hoods.

*lat.* = abbreviation for *latus*, meaning wide or broad.

Lat. = abbreviation for Latin; used to explain the use of a word of Latin origin, e.g. in scientific names, anatomy.

late embryo = a stage prior to hatching where the embryo has developed external characteristics of the hatching stage.

late run = a spawning run late in the season for that particular species.

late spawning = pertaining to a fish which spawns later than usual for a given species.

latent capacity = fishing capacity that is not currently deployed in a fishery.

latent species = a species of fish that has the potential to support a directed fishery.

later synonym = junior synonym (the junior synonym is that with the later publication date of two or more different names applied to one and the same taxon).

laterad = toward the side.

lateral = relating to the side.

lateral band = a longitudinal band of pigment along the side (see also bar and stripe).

lateral canal = the horizontal part of the cephalic lateral line system behind the eye.

lateral commissure = a flange of bone on the lateral surface of the otoccipital region folding over the jugular vein, e.g. in Sarcopterygii.

lateral cusp = a cusp arising on the side of the main cusp of a tooth.

lateral display = when fish display the body side to another fish. May involve various body movements such as quivering, body and tail slapping, and spreading fins. This may be courtship or a threat display. The other fish may fold its fins in submission or extend them to accept the challenge.

lateral ethmoid = parethmoid (a paired deep bone of perichondral origin lying in the front of the orbit under the prefrontal. Also called pleurethmoid, prefrontal, exethmoid and, incorrectly ectethmoid, as this latter is only in birds).

lateral field = the dorsal and ventral parts of a fish scale (when in place) viewed from the side of the body. Usually wedge-shaped.

lateral gular = a paired dermal bone of the basal throat region in, e.g. *Latimeria*.

**lateral head vein** = a vein beside the endocranum receiving four principal branches from the head, namely the anterior cerebral vein (draining blood from the rostrum and the eye), two median cerebral veins (draining blood from the braincase), and the posterior cerebral vein (draining blood from the posterior braincase (sometimes into the anterior cardinal vein)).

**lateral labial teeth** = teeth between the lateral teeth and the marginal membrane in lampreys (Petromyzontiformes).

**lateral line** = a tube-like sensory organ (usually bearing pores) extending along the side of the body from the rear of the head to the tail. Detects water movements, low frequency vibrations (lower than 160-200 Hz) and perhaps temperature changes. In some fishes the sensory organs are uncovered (without a tube or pores). The sensory organs in the canal consist of a group of cells with sensory cilia projecting into the canal. A cupula of a gel-like substance caps the hair-like cilia. Water movements in the lateral line canal moves the cupula and stimulates the hair cells. The lateral line is innervated by the vagus or Xth cranial nerve. The similar sensory system on the head, often called the cephalic sensory canals, is differently innervated. Lateral lines may be single, multiple, complete (extend to the base of the caudal fin) or incomplete, have accessory branches, be decurved, recurved, arched. etc.

**lateral line disease** = hole-in-head disease (head and lateral line erosion (a nutritional deficiency seen in aquarium fish, usually of vitamin C, aggravated by stress and poor water quality. Holes develop in the head and sometimes along the lateral line. Death may result. Also called head and lateral line erosion).

**lateral line organ** = one of the series of horseshoe-shaped structures left on the flank of Myctophidae members when the scales become detached. A lateral line organ count is often used in place of a scale count because scales are very deciduous in this family.

**lateral line pore** = one of the series of the apertures of the lateral line canal. Usually counted from the most posterior one touching the shoulder girdle to the one wholly or mostly in front of the base of the caudal fin. Found in all fishes (except Amphioxo and perhaps some species secondarily lacking them), in amphibian larvae and adult aquatic amphibians.

**lateral line scale** = one of those scales along the side of the body bearing lateral line pores (or pit organs) or in the same row as those. The count may include only the pored scales (usual method) or all scales in the same row.

**lateral margin** = dorsal and ventral scale edges.

**lateral midline** = the region of the horizontal septum between the epaxial and hypaxial muscle masses.

**lateral patch** = a prominent collection of iridophores on the dorsolateral yolk sac on each side of the developing swimbladder.

**lateral radius** = a radius on the lateral field of a fish scale.

**lateral ridge** = a ridge on the anterior preopercle which may bear characteristic spines in larval fishes.

**lateral septum** = a thin partition of tough, fibrous tissue extending laterally from the spinal cord. It divides the body into dorsal (epaxial) and ventral (hypaxial) halves.

**lateral series scales** = a count of scales along the flank when the lateral line is absent or incompletely pored.

**lateral stripe** = the row of melanophores along the horizontal myoseptum.

**lateral teeth** = the teeth found immediately to each side of the oesophagus of a lamprey (Petromyzontiformes).

**lateral threat display** = see lateral display.

**lateralis system** = the lateral line and cephalic lateral line systems, *q.v.* Lateralis may refer just to the canal on the flank.

**laterocaudal** = positioned or directed to the side and rear.

**laterohyal** = an element which is dorsolaterally attached to the epihyal, lateral to the nerves and veins of the head and which articulates with the lateral commissure and the otic capsule.

**lateroparietal** = a skull where the parietals are separated by the supraoccipital bone (as opposed to medioparietal, *q.v.*).

**laterotrichia** = plural of laterotrichium.

**laterotrichium** (plural laterotrichia) = a small unpaired bone rod above the first pelvic ray in some lower teleosts, e.g. Salmonidae, Osmeridae, Esocidae, Cyprinidae, Cobitidae, Balitoridae and Siluridae. Probably derived from a reduced fin ray (dermatotrichia).

**lath** = a poacher's device consisting of small board of light wood weighted with lead to make it float on end. Four or five hooks are attached on lengths of line below the lead. The board is floated across likely fish pools and shallows. The lath, being strung like a kite, works upstream as the line is pulled and can be worked from shore or a boat.

**Latin name** = scientific name (the Latin or latinized name of a taxon as opposed to its popular or vernacular name. Consists of two words, the genus name and the species or trivial name, e.g. *Squalus acanthias*, the spiny dogfish. Convention demands that this name be underlined, italicised, in bold face or in some other fashion distinguished from the rest of the printed text. See also name).

**latinize** = to give Latin form letters and termination to a word of another language or an arbitrary combination of letters.

**latinucleate scale** = a replacement scale (a scale which has formed in the place of a lost scale. The centre portion of a replacement scale is equal in size to the one lost but lacks ridges and radii. Not useable for aging purposes. Also called regenerated scale).

***latus*** = wide or broad. Abbreviated as *lat.*

Laurec-Shepherd = a stock assessment method in fisheries based on virtual population analysis, *q.v.*, and ad hoc tuning of abundance indices and using an age-structured population model.

lave = damming a pool and removing the water in order to catch the fish.

law = a mound of earth and shingle on the bank of a river on to which salmon nets are drawn to be emptied (Scottish dialect).

Law of Fishing = fisheries that are unlimited become unprofitable.

Law of Homonymy = see Homonymy, Law of.

Law of Parsimony = Occam's razor (other things being equal, the simpler hypothesis is chosen).

Law of Priority = see Priority, Law of.

Law of the Fish = the third album by The Radiators a rock band from New Orleans known for a style of music called fish-head music, *q.v.*

Law of the Minimum = the growth of a population is limited by the resource in shortest supply. Also known as Liebig's Law.

laws = there are numerous laws regarding fish and fishing, both commercial and sport fishing, usually associated with catch limits, time of fishing and the type of gear allowed. Some more unusual laws are:-

1 = women clerks can be topless legally in an aquarium shop in Liverpool, England.

2 = fishing from horseback is illegal in Utah.

3 = fishing from a camel's or giraffe's back is illegal in Idaho.

4 = fishing with a lasso is illegal in Tennessee.

5 = fishing with bare hands is illegal in Kansas.

6 = it is illegal to get a fish drunk in Ohio.

7 = aquaria are not allowed on buses in Oklahoma and Seattle.

8 = it is illegal to carry fishing tackle in a cemetery in Muncie, Indiana.

lax = a salmon (Scottish and English dialect).

lax fisher = a salmon fisher (Scottish and English dialect).

lay = 1) to deposit eggs, as a fish.

lay = 2) to set a fishing net.

lay = 3) the agreement between owner and crew on the allotment of the profit of a fishing trip (Newfoundland).

lay line = a line with float and bait for catching pike. Usually left in the water all night, one end being fastened to a tree on the bank.

lay one's hairs in the water = to contrive to do something; taken from the practice of catching minnows or small trout with a horse-hair noose (Scottish dialect).

lay out = 1) putting a net into the water for fishing.

lay out = 2) a net having completely encircled a school of fish.

laydown = a tree that has fallen into the water. Also called falldown.

layer packed = a method of packing fish where the layers of product are separated by a flexible film for easy separation.

laying = the act or time of depositing eggs.

laying out = paying out a line or net. Also called paying away and setting.

laying period = spawning period.

laying room = an area where cod are spread out to dry in Newfoundland.

laying-room = laying room.

layout line = trot line (a longline used in lakes and streams with hooks at regular intervals).

Lazarus taxon = strictly, a taxon belonging to a species that vanished from the fossil record many years ago but the term is generally applied to a taxon whose close relatives were thought to be long extinct, e.g. the coelacanth. Named for the biblical Lazarus who was raised from the dead.

lazy = a forked stick used as a fishing rod rest (British dialect).

lazy deckie = a rope to haul the cod end to a ship's side.

lazy deckie leg = hauling leg (a wire rope extension of the halving becket joined to the lazy deckie (both *q.v.*). Also called bag becket leg, codend gag and gagline).

lazyline = lazy deckie.

lb = abbreviation for avoirdupois pound (0.454 kg).

lb tr = abbreviation for troy pound (0.373 kg).

LD<sub>50</sub> (lethal dose-50) = the dose of a toxicant that is fatal to 50 percent of the fish tested over a specified time.

LDA = prefix for a numbering system for Loricariid catfishes used by the aquarium magazine "Das Aquarium". See L-number above for explanation.

lead = 1) a channel of water, especially one through ice.

lead = 2) in angling, the line between a cannonball (*q.v.*) and a lure.

lead = 3) a length of netting used to guide a fish into a net such as a gill net.

lead = 4) a lead weight used to sink a fishing line or a net.

lead bomb = a tear-drop shaped weight with a swivel at the narrow end. Used in ledgering, *q.v.*, and available in various sizes.

lead core = fishing line having lead within the braid causing it to stay on the bottom.

lead fly = the primary fly on the end of a fishing line.

lead line = 1) the line at the bottom of a net with a series of lead weights used to keep the net low in the water or on the bottom and to maintain the net's shape.

lead line = 2) a weighted line used in determining water depth. Also gives an idea of the type of bottom by having a hollow end which captures a sample of mud, sand, shell, etc.

lead line = 3) groundrope (the rope forming the front edge of a trawl or demersal seine in contact with the sea bed. Often weighted with a chain and, on rough ground, protected by iron or rubber rollers, cookies, *q.v.*, or bobbins, *q.v.*).

lead poisoning = toxic lead levels in the body; found in some fish from consumption of lead weights or sinkers.

lead rope = a rope at the bottom of net to which lead sinkers are attached.

lead stone = the weight used for sinking a fishing line.

leader = 1) a short line with a hook, off the main line in trolling.

leader = 2) the net or other structures set as a barrier to movement and as a means of directing fish into a trap.

leader = 3) wire or strong monofilament line between the hook and main line as a protection against teeth or rough substrates, or weaker line to ensure that a large fish does not break off a long length of line which can entangle and kill it. Also the line with its fly attached to the heavier main line in fly fishing.

leader backer = a length of rope securing the leader of a cod trap to the shore.

leader buoy = a float on a leader (2).

leader foot = the bottom or lower part of a leader (2).

leader head = a length of rope forming the top part of a leader (2).

leader linnet = a length of netting forming the leader (2) of a cod trap.

leader net = a length of net stretching from the shore to a cod trap to guide fish into the entrance. Also called leading net.

leadhead jig = a lure with lead at the anterior end of a long hook. The hook may be bare for live or plastic moulded bait or have feathers, fur or plastic additions.

leading = keeping the rod tip and strike indicator downstream of a drifting nymph.

leading edge = the front of structure, e.g. the forward edge of a fin. Opposite of trailing edge.

leading net = leader (2) the net or other structures set as a barrier to movement and as a means of directing fish into a trap).

leads = the lead weights on the bottom of net, meant to keep the net on the bottom or the lower edge at depth relative to the upper edge. Also called weights or sinkers.

leaf = 1) a grade of isinglass (the glutinous or gelatin-like fluid prepared from the collagen of the outer layer of gas bladders of sturgeons or other fishes. Used in clarifying wines and beers, for jams and jellies, in printing inks and as an adhesive cement).

leaf = 2) an oblong section of a net which is joined to other sections of netting.

leaf-like appendage = oral fimbria (one of a series of small tag-like appendages around the perimeter of the oral disc of lampreys (Petromyzontiformes), presumed to help create an effective seal when the lamprey is attached to its host and also probably sensory. Also called fringed processes, epithelial fringe, fringed lappets, leathery appendices and leathery appendages).

league = a distance measure varying from 2.4 to 4.6 miles, seldom used today; usually taken as 3 statute miles or 4.8 km.

lean = 1) spent fish.

lean = 2) live fish with a flesh fat content less than 2%, either white fish or fatty fish with a seasonally low content.

lean body mass = in aquaculture the body weight of a fish less the weight of fat.

leap = 1) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for salmon.

leap = 2) a deep and large wicker basket used in catching eels and other fish (United Kingdom).

leash = 1) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for trout.

leash = 2) a collective noun for three fish.

leather = of fish, the treated skin used in garments, shoes, handbags, belts, jewelry, briefcases, wallets and novelty items.

leathery appendage = oral fimbria (one of a series of small tag-like appendages around the perimeter of the oral disc of lampreys (*Petromyzontiformes*), presumed to help create an effective seal when the lamprey is attached to its host and also probably sensory. Also called fringed processes, leaf-like processes, epithelial fringe, fringed lappets and leathery appendices).

leathery appendix = oral fimbria (one of a series of small tag-like appendages around the perimeter of the oral disc of lampreys (*Petromyzontiformes*), presumed to help create an effective seal when the lamprey is attached to its host and also probably sensory. Also called fringed processes, leaf-like processes, epithelial fringe, fringed lappets and leathery appendages).

leaving pattern = the method by which a fish leaves one area and migrates to another.

lecithotrophy = nutrients supplied through yolk via vitellogenesis in endogenous feeding, *q.v.*

lecithotrophic = said of larva that develop from a relatively large yolk egg.

lecithotrophic live bearer = facultative and obligate lecithotrophic live bearers (both *q.v.*) are two reproductive guilds (*q.v.*).

lectoallotype = allolectotype (an unofficial term in nomenclature for a type specimen of opposite sex to the lectotype and chosen from the type series subsequent to the original description).

lectogenotype = an unofficial term in nomenclature for the type species of a genus selected from amongst the originally included species where none was designated as the generic type by the original author.

lectoholotype = an unofficial term in nomenclature for a lectotype.

lectoparatype = paralectotype (any one of the original syntypes remaining after the selection of a lectotype). Paralectotype is preferred.

lectotype = one of several syntypes (*q.v.*) designated after the publication of a species-group name, as the type-specimen of the taxon bearing that name. Designated only where there was no original holotype.

lectotypus = lectotype.

ledge = an underwater feature, rocks forming an area of shoal water which cod and bait fish frequent.

ledger bead = a small plastic bead, with a side eye, sliding on the main fishing line. The ledger weight is attached to the eye.

ledger stop = a small plastic sleeve used to stop a sliding ledger weight at the distance required from the hook. It is held in place by a removable plastic peg.

ledger float = a float used in angling that automatically sets itself to the correct depth. It has a two point friction device at the float bottom where the line passes through. When cast out with a slack line the float will rise to the surface, the line can then be tightened until only the desired float tip is showing, and the float will lock as long as the line is tight. Also called self depth adjusting waggler.

ledgering = fishing on the bottom of a river or lake using a lead weight to deliver and place the bait. There are various ledgering rigs. May be spelled legering.

Lee's phenomenon = the common finding that in older fish populations, forms with more narrow annual scale rings or more narrow growth zones (reflecting a slower growth rate in the first year) are more frequent than in younger populations.

leech = 1) a fly tied in imitation of a leech, with dark materials that soak up water.

leech = 2) fish leech, a parasite, *q.v.*

leech line = quarter rope (handling rope used in side trawling to bring the bosom section of the groundrope to the ship's side).

leeging = a fishing area in the deep sea frequented by haaf boats (*q.v.*) only (Shetland and Orkney islands dialect).

leep = boiling for a short time in order to keep for later cooking; also said of newly caught salmon not for immediate use.

leester = leister.

leeward = 1) on the side away from the wind.

leeward = 2) the side of something that is sheltered from the wind.

leeward = 3) toward the wind.

leeward = 4) the direction in which the wind is blowing. Used to describe geographical positions where fish are caught or are absent. See also windward.

left bank = the left side of a river when facing downstream.

leg = one of the wires or chains connecting the net to the dan leno, bridle or otter boards in a trawl. Also called spreading wire.

leg. = abbreviation for collector from the Latin *lego* to gather, collect, *legulus*, a collector, and *legentum* collected by, by courtesy of. A person or institution who finds and secures specimens. Abbreviation often occurs on labels and in scientific descriptions of species. See also coll.

legal-sized fish = fish of a size enabling it to be caught without penalty according to fishery laws and regulations.

legally taken = fish caught and retained according to regulations.

legering = ledgering.

leggy = a small cod, gutted, headed, salted and dried without being split used for home consumption (Newfoundland).

legitimate = use of a name in accordance with the rules of the International Code of Zoological Nomenclature.

legitimate name = see valid name (the correct name for a taxon: a taxon may have several available names, but only one of those names (most frequently the oldest) is the valid name. The valid name is always an available name (*q.v.*) (the reverse is not always true). An invalid name may be either an available or unavailable name). Also called *nomen legitimum* and *nomen legitimatum*, abbreviated as *nom. legit.*

*lego* = to gather, collect. Abbreviated as leg, *q.v.*

*legulus* = a collector. Abbreviated as leg, *q.v.*

leister = 1) a pronged and barbed fish spear, appearing in various cultures world-wide. In England, used for striking salmon by torchlight and now an illegal weapon. See also sun-leistering.

leister = 2) to spear fish.

leister-grained = of the barbel, *Barbus barbus*, heavily marked by a leister (obsolete term).

leister-shaft = the wooden part to which the head of the leister is fastened.

leit = a piece of horsehair used on a fishing line (Clydesdale dialect).

lek = a group of males with small and closely-packed territories where they display to attract females. The females select a male, spawn and leave.

lengi = lengie.

lengie = a long slice of halibut cut either from the back or the belly of the fish (Shetland and Orkney Isles dialect). Also spelled lengi and langie.

length at first maturity = length at which 50% of the individuals of a given sex are considered to be reproductively mature. Usually based on females and estimated by fitting a logistic curve to the relationships between proportion mature and length. Abbreviated as  $L_{50}$ . Also called length at sexual maturity.

length at first spawning = length at which 50% of the population spawn for the first time.

length at recruitment = the length at which fish are recruited to a fishable stock.

length at sexual maturity = length at first maturity.

length of = see ..... length.

length of shoreline = length of the contour of the shoreline.

length overall = a measure of the size of a fishing vessel.

length-frequency distribution = the number of individuals encountered in each length interval.

length-weight relationship = mathematical formula for the weight of a fish in terms of its length. When only one is known, the formula can be used to determine the other.

lens = a usually spherical body of the eyeball suspended by suspensory ligaments and used to focus images on the retina. Fish lenses have been used as age indicators in fishes.

lentic = referring to standing (or slow moving) waters in swamp, pond, or lake, as opposed to lotic or running waters.

lentiform body = a countercurrent system of afferent capillaries interspaced with irregular efferent sinusoids concerned with the elevation of oxygen tensions in the eyes of some teleosts, e.g. *Fundulus grandis*.

lepidologist = one who studies scales.

lepidology = the study of scales.

lepidomoria = plural of lepidomorium.

lepidomorium (plural lepidomoria) = a scale or tooth comprising a thin-walled cone of dentine covered by a layer of enamel and having a bony base. The pulp cavity has a single capillary loop and there is a basal canal and a posterior opening in the neck region (neck canal). Simple scales with this basic structure have been found in Carboniferous sharks. This originally hypothesised structure attempts to explain the origin of denticles or placoid scales of modern sharks and even the scales of Teleostomi as well as teeth.

lepidont = bearing lepidotes.

lepidophagy = scale-eating, several unrelated taxa are known to specialise in eating scales from other fishes using various methods, e.g. *Terapon jarbua* removes scales from *Mugil cephalus*. Scales and associated mucus and skin are not usually the exclusive diet of these species.

lepidomorium = the basic unit of squamation and dentition. Scales and teeth both form at the level of the basement membrane at the mesoderm - ectoderm boundary. In scale formation, the epidermal (ectoderm) cells form the base, which is invaded by mesenchyme recruited from the dermis.

lepidophage = lepidophore.

lepidophore = a scale-eating fish, specialised to tear off the scales of other fishes, e.g. the Lake Tanganyika cichlid *Perissodus microlepis*.

lepidorthosis = erection of scales as caused by disease or parasites.

lepidosis= the arrangement and pattern of scales.

lepidote = a minute tooth-like structure along circuli of scales in Poeciliidae.

lepidotrich = lepidotrichium.

lepidotrichia = plural of lepidotrichium.

lepidotrichium (plural lepidotrichia) = a definitive fin ray (including spines), usually dermal bones found in Teleostomi. Each lepidotrich is formed of two hemitricks closely joined along their length except basally where they diverge to articulate with the pterygiophores. See also actinotrichia, ceratotrichia. Lepidotrichia are thought to have evolved from scales. The pelvic and hypochordal fin membranes of Acanthodii bear rows of scales which correspond to the primitive condition of lepidotrichia. Lepidotrichia form like actinotrichia but become surrounded by bony tissue, develop segments and sometimes branch.

leppie = lippie.

lepto- (prefix) = slender or delicate.

leptocephalus = the transparent ribbon- or leaf-like larvae with large teeth and a far-back anus in certain primitive Teleostomi, e.g. Congridae, Anguillidae, Albulidae, Elopidae and Notacanthidae. The larvae first grow, then shrink prior to metamorphosis.

leptocercal = a tail of attenuate or whip-like form (leaf tail), e.g. in Macrouridae.

leptoid scale = cycloid and ctenoid scales, q.v.

lernaeiasis = anchor worm infestation (*Lernaea* sp.). The fish exhibits a poor appetite, moves slowly and has inflamed and necrotic tissues at the site of parasite attachment. Wounds may be invaded by *Saprolegnia*. Young fish can be killed by 4-5 parasites.

Lessepsian migration = movement (not migration) of organisms from the Red Sea to the Mediterranean Sea via the Suez Canal.

lester cock = 1) a toy boat sent out before the wind by fishermen in rough weather with a string of hooks (Cornish dialect).

lester cock = 2) a floating contrivance with a small sail to carry a boulter (q.v.) seawards in fishing; presumably the same or similar to (1) (Cornish dialect).

lethal concentration = the amount of a toxin that kills half the fish.

lethal dose = the amount of a substance required to kill a given portion of a sample of test fish in a given amount of time, e.g. 24 hours LD<sub>50</sub> is a 50% mortality in a day.

lethal temperature = a temperature causing death, either a maximum or minimum.

lethal time = the time over which an administered chemical will result in the death of half the fish for a given dose. Abbreviated as LT<sub>50</sub>.

lethal unit = the estimated minimum dose needed to kill 100% of test fish in a given time period.

leucism = a whitish colouration but with normal eyes found in nature and bred in aquarium fishes such as the white molly (*Poecilia latipinna*).

leucistic = having leucism.

leucocyte = white blood cells that fight infection. Includes granulocytes (with granules) and lymphocytes, monocytes ad thrombocytes.

leucophore = a yellow pigment bearing cell. Also called guanophore or iridocyte.

levator arcus palatini = a muscle originating on the parasphenoid bone and inserting on the medial surface of the pterygoid. It functions to expand the buccal cavity laterally.

levator hyoideus = a muscle originating from the anteriormost part of the dermosphenotic bone and inserting in a fan shape on the upper lateral surface of the hyomandibula.

levator operculi = a muscle just posterior to the dilator operculi originating from the dermal pterotic bone and inserting to the dorsal medial surface of the operculum. It functions to rotate the operculum dorsally and caudally. This rotation is translated to other elements in the opercular series and then to the mandible by the interopercular-mandibular ligament. The caudal pull on the ligament depresses the mandible and opens the jaws.

levée = an embankment constructed to prevent a river from overflowing, or to contain a farm pond, or a natural embankment formed by sediment deposit during flooding. Also spelled levee. Chevies park here when dry.

levee = levée.

level = occasionally used for rank (the position of a taxon in a hierarchy of classification).

level of exploitation = the amount of catch or the level of fishing mortality; sometimes used without any precise quantity in mind.

level line = an untapered, floating fly line, difficult to cast and not much used.

lever drag = a smooth, lever drag on large ocean-fishing reels.

lever net = a net on a frame operated from shore or from a raft in a dipping motion.

Lévy dive = a Lévy walk in water.

Lévy walk = alternating clusters of short moves with much larger jumps in space, e.g. the movement strategy used by basking sharks, bigeye tuna and Atlantic cod in the water column to locate food, more effective than random searches.

lexicographer = a writer of dictionaries; a harmless drudge (after Samuel Johnson's *Dictionary of the English Language*, 1755), but also an excellent way to learn more about a specialised topic such as ichthyology.

Leydig's gland = the anterior glandular portion of the male mesonephros (kidney) in Elasmobranchii. Its secretions are thought to preserve the vitality of the spermatozoa.

Leydig's organ = a tissue around the oesophagus of Elasmobranchii apparently associated with immune function.

libelotype = derogatotype (a joke term in nomenclature for a type purportedly named in a derogatory way for a person, e.g. a parasite, although some of course are named in honour of co-workers).

liberalised fishing = taking of fish throughout the year without size or number restraints.

liberty-fish = a taboo name (*q.v.*) for salmon in the burghs of Arbroath and Montrose in Scotland having the privilege of salmon fishing within their own liberties or bounds.

lice (singular louse) = fish lice (parasitic crustaceans on marine and freshwater fishes).

licence = a licence is a document giving the holder the right to operate in a fishery according to the terms established by the regulating authority. Also called a permit.

licence limitation = legally restricting the number of commercial fishermen licensed to fish. Often a management agency uses this as a means of limited entry.

license = to issue a licence. License is the verb, licence the noun in English; American English uses license for both.

licensing = restriction of the right to fish to those persons or vessels issued with licences for the purpose.

lie = 1) areas in a water body where fish concentrate, because of shelter, food, reduced current, protection from predators, etc.

lie = 2) of a fish, to rest with little or no movement.

lie-in-wait predation = the feeding method where the predator waits for the food item to come within capture range.

Liebig's Law = Law of the Minimum.

life assemblage = biocenose (the balanced association of animals and plants in a biotope, a natural assemblage; strictly the animal and plant associations excluding the physical aspects of the environment and so not the same as ecosystem. Also spelled biocoenose. Also called biocoenosis).

life cycle = successive series of changes which an organism passes through during its development.

life history = a description of the entire life cycle of a species, including reproduction, growth, food, movements and death.

life table = a statistical summary of a fish population showing survival, reproduction, etc., listed by age classes.

lifespan = the maximum expected age, on average, for a species, cohort, stock, or a population in the absence of fishing. Smaller than maximum age although may be used in this sense. Abbreviated as Tmax in stock assessment models.

lift = 1) fish lift (fish ladder; a series of steps with flowing water enabling a fish to circumvent an obstruction such as a dam by leaping from step to step. Also called fish way).

lift = 2) to bite or rise to the bait.

lift hand net = portable lift-net (a small lift-net, *q.v.*, operated by hand, with no fixed installation).

lift-net = 1) a net of various size and form laid on the water bottom or suspended, sometimes baited or lighted, and lifted out of the water when fish swim over it. Some are hand-operated, others suspended from as many as four boats or from cantilever structures on a bank or boat. See also basnig, two-boat lift net, three-boat lift net, four-boat lift net.

lift-net = 2) a net shaped as a cone, pyramid or parallelepiped used to remove fishes from a ship or from a larger net. May be lifted by hand or mechanically, on ship or on shore.

lift-netter = a vessel equipped so as to operate large lift-nets which are held from the ship's side and raised and lowered by means of outriggers. Sets of powerful lights, above and below the water, are sometimes installed for attracting fish.

lift-tube = a means of moving water in aquarium filters. Large bubbles are released in a tube about 1 inch wide. As the bubbles move upwards, they pull the water in the tube up as well.

lifting line = a line on a purse seine used to lift a group of floats.

lifting strap = rope or wire encircling the cod end through loops or rings to close off the rear section and facilitate its loading aboard.

lig = a fish hook with lead cast around its upper part in order to sink it rapidly (Maine).

ligamentum Baudeloti = Baudelot's ligament (a ligament connecting the upper end of the pectoral girdle with the first vertebra or the posterior end of the cranium).

ligamentum cruciforme = a flat x-shaped tendon located above the ascending process of the premaxillaries in Cichlidae. The anterior arms of the x or cross are fully tensed only when the upper jaw is protruded, otherwise they are folded between the maxilla and the premaxilla. Anteriorly they insert onto the distal maxilla and posteriorly onto the posterior palatine.

ligastyle = a basal element of the pterygiophore involved in the gonopodium of Poeciliidae.

ligature = the union of two letters, not used in scientific names, e.g. æ and œ should appear as ae and oe.

liggar = ligger (2 and 3).

ligger = 1) a floating line with bait used for catching pike and generally wound round a bundle of reeds. A night fishing method (Norfolk dialect).

ligger = 2) a foul salmon (Scottish dialect).

ligger = 3) a newly spawned salmon (Scottish dialect).

ligberman = a pike fisherman, using a ligger (1) (Norfolk dialect).

light cure = 1) fish such as cod and other white fishes cured with small amounts of salt (16-20 parts per 100 fish, fish contains 20-30% salt on a dry basis) or left in salt for short periods (3-5 days).

light cure = 2) the process or product of light smoking.

light fishing = any fishing method that involves light as an attractant.

light meat = 1) a commercial measure of fish flesh colour, e.g. canned tuna is light meat or light tuna when it has a diffused luminous reflectance of not less than 22.6% of that of magnesium oxide when measured by a prescribed method. Equivalent to 5.3 Munsell units. See also white meat and dark meat.

light meat = 2) light muscle.

light muscle = lean muscle that is whitish in most demersal fishes and lighter in colour in fatty fishes than the dark muscle that contains fat.

light organ = structures producing light by a chemical reaction or by means of light-producing bacteria, e.g. in the Myctophidae.

light salted = cured fish with only small amounts of salt used, fish have 20-30% salt on a dry basis. Also called light cure or slack salted.

light smoked = mild smoked (fish smoke-cured for a short period to give a slightly smoky flavour; has limited keeping quality).

light-fished = a vessel with a small catch (Newfoundland).

like a fish out of water = completely unfamiliar with a situation causing discomfort.

like herrings in a barrel = very crowded (slang).

Likert question = a statement posed in an angler survey where the angler indicates agreement or disagreement along a five or more point scale.

Lilian Gish = fish (Cockney rhyming slang).

limbotype = a joke name in nomenclature for a type specimen whose whereabouts is unknown.

lime fishing = catching fish by throwing lime onto the water surface or dragging sacks of lime through a water body or spreading it on mud in drained ponds. As the lime slakes, it burns the fish's gills and they rise to the surface.

lime nitrogen = calcium cyanamide ( $\text{CaCN}_3$ , used in aquaculture as a pond disinfectant, especially for *Myxosoma cerebralis*, the cause of whirling disease).

limewood = a wood material used for making air diffusers in aquaria. This wood is very porous and so acts well as an airstone. Limewood (*Tilia* sp.) comes from the English name for these trees (also called linden and basswood).

Limerick hook = a hook with a half-round parabolic bend with a straight point.

limicolous = living in mud.

liming = addition of calcium carbonate to a water body to reduce its acidity and help preserve fish stocks.

limit = the maximum legal amount of fish that can be caught when angling; may be weight or numbers.

limit capacity = the maximum amount of fish that can be produced on a sustainable basis by a fully-utilized fleet; corresponds to the maximum sustainable yield.

limit reference point = indicates the limit beyond which the state of a fishery and/or a resource is not considered desirable. Fishery development should be stopped before reaching it. Abbreviated as LRP.

limited access = limited entry. Sometimes used to include all controlled access to use of a natural resource, including full ownership.

limited entry fishery = a fishery where the number of operators or gear is restricted to control the amount of fishing effort; frequently involves controls on the number and size of vessels, and condition relating to the transfer of fishing rights or the replacement of vessels.

limited fishing zone = an area where only certain types of fishing or of fishing equipment are allowed.

limited licensing = a certain number or type of licences issued for a fishery.

limiting factor = any need such as food, habitat or spawning gravel that is in shortest supply with respect to all resources necessary to sustain life and thus limits the size or retards production of a fish population.

limiting nutrient = an essential nutrient in an aquaculture feed at low concentration, resulting in a deficiency.

limn- (prefix) = lake.

limnarium = the freshwater equivalent of an oceanarium; an aquarium reproducing lake and river habitats.

limnetic = living in or pertaining to marshes or lakes; the zone of deep water between surface and compensation depth.

limnic = of or relating to lakes.

limnicoid = inhabiting lakes.

limnicole = an inhabitant of lakes.

limnicolous = living in lakes.

limnion = fresh water including all water bodies.

limnivorous = mud-eating.

limnobiology = the study of organisms living in standing waters.

limnobiont = a freshwater organism.

limnobios = the total life of fresh waters.

limnocrene = a large spring pool, with or without an outlet.

limnodromous = migrating within a lake, e.g. *Perca fluviatilis*.

limnology = the study of lakes, ponds and standing waters and their biotas.

limnophilous = thriving in standing waters.

limnophobia = a fear of lakes.

limpet = to chew limpets and eject them from the mouth upon the water in order to attract fish to the boat (Shetland and Orkneys dialect).

lin-her = lin-keeper.

lin-keeper = a large freshwater trout which remains in one particular pool (Scottish dialect). Also spelled lin-her or lin-lyar.

lin-lyar = lin-keeper.

Lindsey's rule = the generalization that among fish and amphibian faunas the proportion of species with large adult size tends to increase from the equator towards the poles.

line = 1) a thin mark of any orientation, used in colour descriptions of fishes.

line = 2) a line made of twisted hair, silk, nylon or other material used in angling. The line carries the lure or bait at its end and presents it to the fish. Lines may be operated by hand, cast from a rod using a reel or trailed behind a boat. Lines are classified by their strength, weight, material, length and construction.

line = 3) a pre-metric measurement appearing in some older ichthyological works, 12 lines making one inch.

line = 4) to fish with a line.

line belly = the large section of a weight-forward (*q.v.*) fly line.

line bite = an apparent bite on a fishing rig caused by a fish blundering into the line. Also called liner.

line breeding = the selective breeding of a strain of fish.

line clip = a small plastic clip placed on a fishing rod handle with a piece of plastic enabling the line to be wedged beneath it. If a fish bites, the line is pulled from beneath it.

line dressing = silk fly lines needed to be oiled to clean them and increase buoyancy. Modern lines are cleaned with warm water and soap.

line fish = fish caught with a line.

line fishing = fishing methods that employ fishing lines in one form or another including handlines, pole-and-line, droplines, longlines, trotlines and troll lines.

line gear = hand-lines and trawl lines.

line guide = the rings on a fishing rod through which the line passes.

line hand = the hand used to handle the fly line when casting; as opposed to the rod hand.

line memory = when a fly line, leader or tippet retains its shape, whether spooled, coiled bent or tied.

line of water = a unit for measuring depth of water, the length of a trawl-line (Newfoundland).

line precedence = when two different names for the same taxon are first published in the same publication, then the one which appears on the earlier line has line precedence. Line precedence does not necessarily mean priority as well, this is determined by the action of the first reviser.

line scoll = a box for holding fishing lines.

line speed = the speed a fly line attains when cast.

line standards = fishing line is made to various standards including breaking strain, limpness, shock, abrasion resistance, diameter and elasticity.

line trawl = longline.

line weight = the weight of the first 30 feet of a fly line, used as a way to compare fly lines when matching them to fly rods of different stiffness.

line-maker = an artisan engaged in the making of fishing lines.

linea lateralis (plural lineaæ laterales) = lateral line.

lineæ laterales = plural of linea lateralis.

lineage = organisms or populations forming a series of ancestors and descendants.

linear reef = a coral formation parallel to the shore or shelf edge.

linear scale = a scale whose exposed portion is higher than wide.

lineage = any continuous line of descent; any series of organisms connected by reproduction by parent of offspring.

linear reef = a coral formation that is oriented parallel to the shore or the shelf edge.

liner = 1) a fishing vessel that uses lines and hooks, with or without a bait, e.g. handliner, longliner, pole-and-line vessel.

liner = 2) line bite.

lingual = pertaining to the tongue; or looking out from inside the mouth (opposite of labial).

lingual lamina = a cusp found on the tongue of lampreys (Petromyzontidae). These laminae consist of an anterior or transverse lamina and posterior or longitudinal lamina.

lingual plate = a dermal toothed bone covering and sometimes fusing with the basihyal, e.g. in Osteoglossidae. Also called glossohyal, dermentoglossum, entoglossum, os entoglossum, supralingual or basihyal dental plate.

lingula = small tongue-shaped structure.

Linie = 2.174 mm in Germany; but the Wiener Linie = 2.195 mm in Austria. Both may be used in older taxonomic works.

lining = 1) fishing by means of hand or longline with baited hooks.

lining = 2) the length of hair or fine gut by which the hook was fastened to the fishing line in angling.

linked ponds = a number of diversion ponds in a series with a common outlet.

linklet = a piece of line to which a fishing hook is attached (Northumberland dialect).

linn-keeper = a large trout haunting a particular pool (Scottish dialect).

linn-lier = linn-keeper.

Linnaean species = a broad concept of a species often comprising many varieties.

Linnaean system = in nomenclature, the use of two names to identify and delimit a species, a generic name and a specific epithet, written according to the rules of classical Latin.

Linnaean tautonymy = the identical spelling of a new generic or subgeneric name established before 1931 and a pre-1758 name cited as a synonym of only one of the species or subspecies originally included in that genus.

linneon = a taxon distinguished morphologically, usually applied to one of the large species described by early naturalists. Named for Carolus Linneaus (or Carl von Linné).

linnet = 1) twine used for knitting or making fish nets (Newfoundland).

linnet = 2) the sections of netting forming the parts of fish nets (Newfoundland).

linnet = 3) the complete fish net, e.g. seine, trap (Newfoundland).

linnet = 4) a section of netting used for various purposes on land (Newfoundland).

linnet edge = part of a section of netting in a cod trap attached to a line or rope forming the frame of the device (Newfoundland).

linnet pole = a pole from which a fish net is suspended to dry (Newfoundland).

Linpe Method = induction of ovulation in aquaculture by injection of a combination of a synthetic gonadotropin-releasing hormone analogue (LHRN-A) and the drug domperidone. The hormone stimulates the sex organs of the fish, while the drug inhibits the action of dopamine, a substance produced by the fish that inhibits ovulation. Named for H. R. Lin and R. E. Peter.

lint = 1) a herring-type drift net.

lint = 2) the inner, smaller mesh, net panel of a trammel net.

lint = 3) netting in the main body of a drift or gill net. Also called body, middle twine, middle yarn, netting, sheet, webbing, yarn.

lioom = a smooth, glancing appearance of the water surface when crushed limpest are used as fish bait or fish liver oil is used to reduce wave action (Scottish dialect). Also spelled loom, lum, lume, luum, ljeum, lumie and ljumi.

lip = 1) in angling, the projection on a crankbait that produces a diving action when retrieved.

lip = 2) lifting a fish by its lower jaw; usually bass (*Micropterus* spp.) which do not have strong jaw teeth.

lip cartilage = cartilaginous supporting elements of the lips in Elasmobranchii.

lip-lock = an aggressive behavior seen when two fish face each other and grab each other's mouth. Lasts for seconds or minutes and is used as a test of strength and willingness to hold position, e.g. in territorial cichlids to assert boundaries, in potential spawning partners to test each other prior to mating. May lead to lip damage or even a dislocated jaw.

lipid hepatic degeneration = a disease of trout where the liver turns yellowish-brown. Overfeeding needs to be avoided and controlled feeding with fresh bovine liver administered. Starvation will also help this disease.

lipless crankbait = an artificial bait made to resemble a swimming fish by its vibrating or wobbling action or even rattling. Lacks a visible diving lip and the line attaches to the top of the lure. Also called swimming bait or lure, or tail spinner.

lipophor = chromatophores containing carotenoids, the erythrophores or xanthophores.

lipostichaerin = a toxic lipoprotein found in the Japanese *Stichaeus grigorjewi* (Stichaeidae). Probably analogous to lipovitellin in hen egg yolk. Previously called dinogunellin when the species was placed in the genus *Dinogunellus*.

lipotype = a species which is absent from a particular area and thus characterises that area. Not a term in nomenclature.

lippie = a large basket used for catching or keeping fish (Scottish dialect).

liquamen = a fish sauce of the ancient world and Middle Ages made from small fish that otherwise would be discarded. Brined fish are allowed to ferment, perhaps with fish blood, spices and herbs. See also garum and muria.

liquid fish = fish silage (liquefied fish waste produced by self-digestion, with the addition of acid, or fermentation and used for animal feed). Also called liquid fish protein.

liquid fish protein = liquid fish.

liquid smoke = a spay or dip formed from a condensate of the components of wood smoke, used to impart a smoky flavour to fish. Also called smoke dip, smoke solution.

liquid smoking = soaking in a solution of water and wood vinegar, drying in shade or air-dried to 45% of water content; a quick smoking method.

listed species = a fish species designated as threatened or endangered, e.g. under the Endangered Species Act in the U.S.A.

lister = leister.

listeriosis = a disease caused by the pathogenic bacterium (*Listeria monocytogenes*) which is widespread in nature and can rarely infect fish at all stages of the food producing process. Can survive heat, freezing and drying. Causes gastrointestinal upsets, usually mild, except to the usual at risk groups (elderly, young, pregnant, immuno-compromised).

lists = rows on a flake, *q.v.*, formed by loose longers, *q.v.*, that held flake boughs in place and between which fish were laid in the Newfoundland fisheries. Also called panes.

lit up = certain pelagic fishes such as sailfish, marlin and wahoo develop bright powder blue colours when excited or hooked by anglers.

liter = litre.

litho- = related to stone or rock.

lithograph = 1) an obsolete method of printing from stone where the surface was, in part, made retentive of ink. Used in fish illustrations.

lithograph = 2) any modern process where a surface is made retentive of ink; mostly photographic.

lithopelagophil = a reproductive guild (*q.v.*) of rock and gravel spawners with pelagic larvae characterised by an adhesive chorion over the zona radiata at first with some eggs soon buoyant. After hatching free embryos are pelagic by positive buoyancy or active movement.

The young are not photophobic and there is a limited respiratory structure. An example of this type is *Sander vitreus* (Percidae).

lithophil = 1) a reproductive guild (*q.v.*) of open rock and gravel spawners with benthic larvae characterised by the early hatched embryo being photophobic (hiding under rocks), moderately developed respiratory structures and late appearing pigment, e.g. *Rhinichthys cataractae* (Cyprinidae).

lithophil = 2) a reproductive guild (*q.v.*) of hidden rock and gravel spawners where eggs and embryos fall into crevices or are concealed in nests (redds). Eggs have large, dense yolks, extensive capillary networks for exogenous respiration, carotenoids for endogenous respiration, embryos are photophobic, and emerging alevins are large, e.g. *Salmo salar*.

lithophil = 3) a reproductive guild (*q.v.*) where the eggs are strongly adhesive, oval or cylindrical, and attached by fibres in clusters from one pole of the egg. The eggs are laid on rocks and tended. Most species have pelagic, free embryos and larvae, e.g. *Benthophilus stellatus*.

lithophil = 4) a reproductive guild (*q.v.*) involving nesting, where eggs are in spherical or elliptical envelopes, always adhesive, free embryos are photophobic or with cement glands, embryos swing tail-up in respiratory motions, moderate to well-developed embryonic respiratory structures present, and many young feed first on mucus of the parent, e.g. *Lepomis macrochirus*.

lithophilic = associated with a stony substrate.

litre = 33.81 fl oz, 0.264 gal. Abbreviated as L.

litres per minute = 0.264 gal/min. Abbreviated as L/min.

litter = those organisms produced at multiple births.

little black fish = "The Little Black Fish" is a book by Iranian writer Samad Behrangi. The fish of the title wants to swim against the current, explore the world and defy tradition. Often taken as an allegory for the modern world. The author died while swimming in a river.

little boat = a boat used by inshore fishermen on the south coast of Newfoundland, 22-28 feet long, used for handlining, longlining and trap fishing for cod. Adapted from the Swampscott dory of Nova Scotia and New England.

littoral = the intertidal zone between high and low tides marks; the shallower shore waters of the continental shelf from 0 to 200 metres depth, a usage no longer recommended. The latter was divided into eulittoral and sublittoral (*q.v.*). In lakes littoral is applied to the zone from the water's edge to the lakeward limit of rooted aquatic vegetation, ca. 10 metres.

live bait = living items used as bait on a hook or in some other fashion, e.g. worms, fish, eggs, etc.

live bait tank = live bait well.

live bait well = a container where small fish are kept alive as bait. Also called live bait tank.

live bottom = a rocky bottom, often very flat, with attached invertebrates forming an attractive environment for fishes.

live box = a container filled with water and often equipped with accessories such as aeration equipment that is used to hold and transport live fish. Also called live well.

live car = 1) live box.

live car = 2) a vehicle used for transporting live fish.

live fast, die young = an r-selection (*q.v.*) lifestyle found in some fishes, e.g. in the pygmy goby, *Eviota sigillata*, on the Great Barrier Reef which lives for only 59 days, the shortest lifespan of any vertebrate. Probably a response to intense predation.

live fish = 1) a fish that is alive, not dead.

live fish = 2) fish that are captured and sold alive to a consumer.

live fish = 3) a fish capable of living outside water for extended periods since it can breathe atmospheric oxygen.

live food = microscopic organisms such as brine shrimps and rotifers used to feed larval fishes in aquaria and in aquaculture facilities.

live release = returning a fish caught in sport quickly to the water in order to preserve stocks.

live rock = 1) primarily calcareous rock with its associated algae, corals, microorganisms and invertebrates used in marine aquaria where it serves as a bacterial filter. See also coral rock.

live rock = 2) a coral-like seaweed or nullipore (*Corallina officinalis*) (Newfoundland).

live sand = sand from the sea which contains living flora and fauna. Used as a medium or substrate in aquaria and can also be used in the biological start up of a new marine tank.

live storage = the storage of live fish.

live tank = live well.

live weight = the weight of a complete fish.

live well = a hold in a vessel with renewed and circulating sea water for holding fish or bait. Also used on small boats by anglers in both fresh and marine waters when catches need to be kept fresh over long periods for later consumption or live release. Also called live box.

live-bearing = 1) ovoviparity (production of eggs that are fertilised and hatch inside the mother but the embryos lack a placental connection to the oviduct or uterus and so do not feed off the mother. The young are born as miniature adults, free-swimming and feeding.

live-bearing = 2) viviparity (the condition of giving birth to active, free-swimming young).

live-eels = fields (English slang).

liver = a structure anterior and dorsal to the stomach, covering part of the stomach. It serves to store glycogen, in detoxification, decomposition of blood cells, protein synthesis and production of chemicals used in digestion.

liver bannock = bannocks baked with the liver of fish between them (Scottish dialect).

liver butt = a container for cod livers and their oil.

liver covel= a container for cod livers and their oil.

liver cup = a dumpling or pastry filled with the liver of fish (Scottish dialect).

liver dounie = liver downie.

liver downie = a dish of potatoes, fish and fresh fish livers mashed together, sometimes with roe added (Scottish dialect).

liver flackie = two half-dried young coalfish filleted and roasted on a hearth with fish livers spread between them (Scottish dialect).

liver foal = a thick cake made with oatmeal and fish liver and boiled with the fresh fish.

liver head = the head of a fish stuffed with liver and boiled (Scottish dialect).

liver maund = a container for cod livers and their oil.

liver moggie = a dish consisting of the stomach of a cod filled with the fish's liver.

liver musgie = liver moggie.

liver pelek = a dish consisting of roe membranes stuffed with fish livers and boiled (Scottish).

liver puncheon = a container for cod livers and their oil.

liver factory = a building or plant with facilities for the processing of cod-liver oil (Newfoundland).

liver flackie = two half-dried, young coalfish filleted and roasted on the hearth with fish-livers spread between them (Scotland).

liver flakkie = liver flackie.

liver moggie = the stomach of a cod stuffed with fish liver an d boiled (Shetland Isles dialect). See also livered moggie.

liver muggie = liver moggie.

liver note = a token given to a fisherman for the value of cod livers sold to merchants in Newfoundland.

liver oil = oil extracted from fish livers and used industrially or as a source of vitamins A and D.

liver paste = fish liver ground up with salt, spices and other flavouring ingredients.

liver stain = in commercial preparations of fish, a measure of liver stain is recorded by degree, area of coverage and size of fish.

livered moggie= the liver of a cod boiled in the fish's stomach (Shetland Isles dialect). See also cropping moggie, liver moggie and liver muggie.

livery-downie = liver downie.

livery-foal = a thick cake made with oatmeal and fish liver and boiled with the fresh fish (Orkney Islands dialect).

(the) living fish swims in water = the supposed relationship between Finno-Ugric languages (Finnish and Hungarian for example) where these words form the only mutually comprehensible sentence (according to the Estonian philologist Mall Hellam).

living fossil = an extant species morphologically similar to a fossil; a taxon little changed over long periods, e.g. the coelacanth, *Latimeria chalumnae*.

livyer = a permanent settler in the historical fisheries of Newfoundland or Labrador as opposed to a seasonal, migratory fisherman from England. Usually applied to a year-round settler on the coast of Labrador in contrast to summer fishing crews from Newfoundland (livyer, live here).

lizard =soft, plastic lures similar to a salamander in form used on Carolina rigs (*q.v.*) in shallow water in spring.

ljeum = lioom.

ljumi = lioom.

llyn = lake (Welsh).

$L_{\max}$  or  $L_{\text{max}}$  = maximum reported length of a fish in an unexploited population. Sometimes used instead of  $L_{\infty}$  from the von Bertalanffy growth function as growth curves have not been determined for some species.

loach = 1) any small fish.

loach = 2) members of the families Cobitidae, Balitoridae and Nemacheilidae.

loaded float = in angling, a float with a built-in brass or lead weight in its base.

loaded to the gills = someone who has been drinking like a fish, *q.v.*

loader = 1) a cod with a blunt head, believed to indicate a large catch will follow (Newfoundland). See also seal-head cod.

loader = 2) a herring with specially beautiful tints (East Anglia dialect).

loading = the effect of the weight of a fly fishing line and the momentum of the cast upon the rod. A loaded rod is bent or loaded more with a greater casting force and a heavier line.

loan shark = a person who charges very large amounts of money for lending money to someone. Based on the predatory reputation of the shark. See also cardshark and poolshark.

loaves and fishes = 1) a miracle performed by Jesus when preaching to a crowd of thousands who grew hungry and needed to be fed. Only five loaves and two fishes were available but Jesus blessed the food and then commanded his disciples to distribute it among the people. The food continued to appear undiminished and after everyone had eaten and was satisfied, twelve baskets of food remained.

loaves and fishes = 2) emoluments, profits, temporal benefits (slang based on the above).

lob = a stone tied to a fishing line to keep it fast when thrown from a rock (Cornish dialect).

lobate = with lobes.

lobby = a fish bin on a catcher/processor vessel.

lobe = one of a series of small rounded protrusions along the dorsal and ventral edge of the sagittal otolith.

lobster cocktail = lobster canned with cod, haddock, hake or cusk or a combination of these.

lobulate = bearing small lobes.

lobulus = small lobe.

lobus = lobe.

lobworm = marine worms having a row of tufted gills along each side of the back; often used for fishing bait.

*loc. cit.* = abbreviation for *loco citato*.

local depletion = observed when localised catches take more fish than can be replaced locally or through immigration. Occurs independent of the status of the overall stock.

local ecological knowledge = empirical, non-scientific knowledge acquired by local resource users, fishers in the case of fish.

localised = said of a population occupying a small geographical area distinctly separated from other populations of the species.

locality = the geographical position of an individual, population or collection.

locality type = an unofficial term in nomenclature for absurd or unusual names for types, e.g. egg type, larval type, seasonal type, sexual type.

location = a geographically or ecologically distinct area in which a single event, e.g. pollution, will soon affect all individuals of the taxon present. A location usually, but not always, contains all or part of a subpopulation of the taxon, and is typically a small proportion of the taxon's total distribution.

locator = depth finder (a sonar device used to determine depth and bottom structure and to locate fish).

locavore = an eater of locally grown or caught produce, including fishes, opposite of distavore, *q.v.*

loch = lake; an arm of the sea when nearly landlocked (both Scottish).

lock = 1) fish way (fish ladder; a series of steps with flowing water enabling a fish to circumvent an obstruction such as a dam by leaping from step to step).

lock = 2) a section of a canal with large doors at each end, allowing boats and ships to be moved from one level to another along the waterway by raising and lowering the water level within the lock.

lock shot = in angling, split shot (*q.v.*) used to fasten a float in place on the line and add casting weight.

locker = 1) a wooden receptacle where cod are washed and salted after being headed, gutted and split in Newfoundland.

locker = 2) a compartment on a boat used for storing fish.

locking mechanism = said of spines that have a mechanism (of varying form) that enables them to be locked erect and thus not easily depressed by a predator.

locks = mild cured sides, often of salmon (various species of Salmonidae), cold cured for 1-3 days. Also called lox.

*loco citato* = place cited (publication and page), meaning cited above; used to avoid repetition of a reference. Abbreviated as *loc. cit.* or *l.c.*

locotype = topotype (a specimen collected at the type locality but not necessarily part of the type series). Topotype is preferred.

loculi = plural of loculus.

loculus (plural loculi) = one of the minute subquadrate bead-like elements forming the circuli in scales of Anguilliformes. Formerly called platelets.

lodge = 1) an establishment on a lake or river set up to serve anglers, offering accommodations, gear and guides, in North America.

lodge = 2) of fishermen engaged in salmon, or in deep-sea, fishing (Scottish dialect).

loft = an upper room in a fishing premises used for the storage and repair of nets and other gear (Newfoundland).

log = 1) slang for a barracuda.

log = 2) swordfish or dolphin (fish) that have been headed, gutted and tailed with belly flaps trimmed.

log line = a graduated line used to measure vessel speed or current speed from a stationary vessel.

log reduction = in food inspection, a process that results in an exponential reduction in the numbers of a specific microorganism contaminating a fish. One log reduction means a 10 fold or 90% reduction in the number of microorganisms.

log shot = the last fish catch of the season after which the log of the season's catch is made up.

log-load = a full cargo of fish (Newfoundland).

log-loaded = a boat heavily laden with fish (Newfoundland).

logbook = a detailed, usually official, record of a vessel's fishing activity registered systematically on board the fishing vessel, usually including information on catch and its species composition, the corresponding fishing effort and location. Completion of logbooks may be a compulsory requirement for a fishing license.

logger load = log-load.

logging = said of cod moving in a sluggish fashion (Newfoundland). See also logy.

logjam = a group of logs pushed together by wind or water action to form an obstruction. Often provides useful habitat for fishes such as salmonids.

logonym = an unofficial term in nomenclature for the name of a species which became the type of a genus-group name by subsequent designation.

logotype = a type determined from a written description in the absence of an illustration and of a specimen. Regarded as an obsolete term.

logy = 1) fish in poor condition or sluggish.

logy = 2) fish of poor quality (Newfoundland).

loin = 1) thickest part of a fish fillet, e.g. haddock fillets in Maritime Canada restaurants.

loin = 2) one of four strips of light muscle from a tuna, two from each side. Loins can be cut into steaks.

lolly ice = frazil ice in sea water (a form of fine spicular ice. When first formed the particles are colloidal and not visible in the water in which they float).

London cut cure = haddock split and smoked with the backbone on the left side. Prepared in Grimsby for the London market.

long bath = immersion of fish in a chemical solution of low concentration as a treatment for disease or parasites. Used in ponds the chemical is allowed to disperse naturally.

long gut = the stomach and intestine of a fish pulled out and still attached to the head of a nobbed (q.v.) fish, leaving the gonads in the unslit belly.

long hundred = 120 herrings, used in counting the catch.

long on = in angling using a float or bobber, when a length of line is allowed to lie on the bottom, increasing the time it takes for a bite to register on the float or bobber.

long pole = a fishing rod used in match fishing in Europe. Up to 16 m long and composed of 1.0-1.5 m sections.

long seasonal pond = a water body for fish cultivation available for 6-8 months of the year.

long seine = a seine anchored at one end by a stake, set by a power boat running in a circle back to the stake.

long-haul seine = a 350 metre seine set by a boat but hauled by hand.

long-line release = losing a fish before it can be landed.

long-liner = longliner.

long-netting = an old form of fishing in early Medieval England where a net is angled so that the incoming tide would wash over it and then, on its way out, fish would become entrapped.

long-tail account = a fisherman's account with a merchant extending from one fall season to the next (Newfoundland).

long-term potential catch = the largest annual harvest in weight that could be removed from a fish stock year after year, under existing environmental conditions.

long-term potential yield = the largest average harvest that can be taken from a fish stock on a sustainable basis, allowing for variable environmental conditions. Abbreviated as LTPY.

longer = a long tapering pole of spruce with the bark left on used in constructing the roof and floor of stages wharves and flakes, *q.v.* Also called lunger.

longevity = 1) the age in an unexploited stock at which only 1% of a cohort has survived.

longevity = 2) the age at death of an individual.

longirostrine = the combination of a long, thin rostrum and procumbent teeth seen in crocodiles and others and related to a fish-eating diet.

longitudinal ligament = a ligament in a neural arch canal above the spinal cord in Acipenseridae.

longitudinal lingual lamina = a cusp found on the tongue of lampreys (Petromyzontidae), a posterior or longitudinal lamina.

longitudinal scale series = the scale rows running along the body from behind the gills to the base of the caudal fin. The number of longitudinal series is usually counted in the transverse row from the origin of the dorsal fin to (not including) the lateral line and from (not including) the lateral line to the anal fin origin. The number of scales along a longitudinal series may count the number of lateral line scales, the number of scales in the row one above the lateral line or the number of transverse series from the gill opening to the tail base.

longitudinal septum = a sheet of connective tissue separating the muscle masses of the left and right sides; a dorsal septum separates the epaxial, and a ventral septum the hypaxial, muscle masses.

longline = 1) a fishing line with baited hooks set at intervals on branch lines; it may be 150 km long and have several thousand hooks and can be on the sea bed or above it supported by floats. It may be anchored or drift free and is marked by floats. Seabirds may take the baited hook before it sinks and are pulled underwater to drown. This can be partly avoided by setting streamers that flap and scare birds away, by setting lines at night when most albatross do not feed, weighting the line so it sinks quickly, using bird-scaring water cannons, and setting the line nearer the water surface rather than over the side of the boat. Also called line trawl.

longline = 2) a long line on the end of fishing rod.

longline = 3) a fishing pole with a rig the same length; used mostly in trotting, *q.v.*

longline = 4) end rope (a line connecting the end of the first or last section of a longline backrope or string to the dan line (all *q.v.*). Also called back of line, dumb string, dummy, end tow, lud tow and spreadline).

longline pot = a fixed line with two or more pots attached.

longliner = a fishing vessel employing longlines. Several automatic or semi-automatic systems are used on larger boats to bait the hooks and to shoot and haul the lines.

longliner knot = a knot used by anglers to attach a hook line to a heavy main line such that the hook line will not slip. Various websites have animated steps showing how to tie this knot.

longshore = 1) directed along the shore.

longshore = 2) existing on, frequenting, close to or parallel to the shore.

longshore bar = a sand ridge paralleling the shore that may be exposed at low tide.

longshore current = wind-driven current along the shore, playing an important role in sediment transport and deposition and thus affecting fishes through habitat formation.

longshore trough = an elongate depression in the offshore zone outside the breakers.

longshoreman = 1) a man who fishes from, or along, the shore (archaic).

longshoreman = 2) a person employed to unload ships.

looacher = loach.

look-on net = a part of a fishing net pulled up to ascertain if any fish have been caught.

loom = 1) the track or wake of a fish (English dialect).

loom = 2) lioom.

loop = the u-shape of the cast fly line. Rods with soft action produce more open loops and a gentle presentation while fast rods produce tighter loops and greater distance.

loop connection = fly or leader rigs with loops tied in each section which can be interlocked for easy changing.

loop net = a net suspended in a framed structure, with a handle. When the fisherman senses movement the net is manipulated in order to catch the fish.

loop-to-loop knot = a simple way of joining two pieces of line.

looping = a fishing technique in Nepal, locally called *paso*, used for migratory fish such as *Schizothorax* and *Labeo* species (Cyprinidae). A nylon line with 3-5 loops is placed in a river with a coloured lead weight acting as bait. Fish, shrimps and aquatic insect larvae may also be used as bait. The fish is attracted by the bait, swims into the loop and becomes stuck by its dorsal and pectoral fins.

loose action plug = a lure with wide slow movements from side to side.

loose fish = 1) a dissipated person, as a loose fish has made its way out of a net so a person has thrown off moral restraint.

loose fish = 2) an independent member of Parliament (slang).

loose ice = ice covering five-tenths to eight-tenths of the water surface. Also called broken ice, loose pack ice, open ice, open pack ice, slack ice.

loose feed = the use of particle bait to attract fish to an area where an angler has baited hooks. The particle bait can be the same as the hook bait or sweet corn, maize, trout pellets, etc.

loose fish = 1) a fish that has escaped the net.

loose fish = 2) a dissipated character (slang).

loose fish = 3) an independent member of parliament.

loose fish = 4) by-catch, fish that may take hooks meant for other fish.

loose fish = 5) a prostitute (slang).

loose pack ice = loose ice.

loose-action plug = a fishing lure having wide and slow side to side movements.

loose-fish = 1) a fish that has escaped the net.

loose-fish = 2) a dissipated character (slang).

loose-fish = 3) an independent member of parliament.

loose-fish = 4) by-catch, fish that may take hooks meant for other fish.

loose-fish = 5) a prostitute (slang).

lophocercal = protocercal (the type of tail fin primitively symmetrical, both internally and externally, and hence one which has not undergone reduction or modification of the original form, e.g. in Petromyzontiformes).

lord = 1) a fish with lordosis (Newfoundland).

lord = 2) the master of the first English fishing vessel to reach a harbour in Newfoundland, with certain privileges for the season. See also fishing admiral.

lord of the harbour = lord (2).

lord-fish = a fish with lordosis (Newfoundland).

lordosis = an abnormal dorso-ventral curvature of the fish vertebral column; a hump.

lore (plural lores) = the area between the eyes and the mouth on a fish's head (more usually used in ornithology).

Lorenzini's ampullae = the mucus filled canal system opening on the snout of Elasmobranchii, *Polyodon spathula* and *Plotosus anguillaris*. May be electric, pressure or temperature receptors.

lores = plural of lore.

loreum = lore.

lose a fly to catch a trout = one has to sacrifice something in order to get what you want (the sacrifice is minor compared to the gain).

lose in hake, but gain in herring = lose one way, but gain in another. Herrings are reputedly persecuted by hake.

lose one's spring = to experience a failure at fishing (Newfoundland).

lose one's summer = to experience a failure at fishing (Newfoundland).

lose one's year = to experience a failure at fishing (Newfoundland).

losing stream = a stream or a part of a stream that loses water to the groundwater. Also called influent stream.

lot = 1) all the specimens collected at one time and place (including one or more species, a collection lot; including one species only, a species lot).

lot = 2) a shipment or part of a shipment of fish that is of the same species, is processed in the same manner by the same producer, is packaged in the same size of container and bears the same label.

lothier = a large fish springing from the angler's hands and dashing into the water (Lancashire dialect).

lotic = referring to running water as in rivers or streams, as opposed to lentic or still waters.

lou = low.

lough = lake or inlet of the sea (Irish).

louning = thin, meagre, lanky, long, emaciated or spent, sometimes said of fish (Cornish dialect).

loup = lippie.

loupin an' leevin = newly-caught, not quite dead (Scottish dialect).

louse = any crustacean parasitic on fishes. Usually refers to *Argulus* (Branchiura) found on the skin and occasionally the buccal cavity. Causes ulcers at the attachment point. love = a horizontal ledge in a smoke house about 7 feet from the floor from which spits or sticks of herrings are suspended, so as to allow smoke and air to pass freely (Norfolk dialect).

low = a fire kindled on a river bank by poachers in Scotland.

low head dam = a dam extending across a river of low height, usually 15 feet (about 5 metres) or less. It impounds the water behind it, has minimal effects on the downstream regime and allows water to fall over its whole width. Quite dangerous as boaters and swimmers may not

see it until too late and can be caught in the backwash beneath the dam. Also called channel dam or run-of-the-river dam.

low temperature disease = coldwater disease (a bacterial disease of juvenile and yolk-sac fry of salmonids caused by *Cytophaga psychrophila* (or *Flexibacter psychrophilus*). It occurs at temperatures below 10°C and is an external and systemic disease with lesions on the fins skin and muscles, often concentrated on the caudal peduncle. Survivors may lose the caudal fin. Severe outbreaks leave fish lethargic and spinal deformities develop, or some fish may show spiral swimming, dorsal swelling and dark pigmentation on one side of the body; mortality is common. Also called peduncle disease).

low tide = low water, a non-technical term.

low water = 1) the lowest level of the tide, the minimum height reached by each falling tide; also the time of that tide in a 12-hour cycle at a particular point.

low water = 2) a low stage of the water in a river or lake.

low water line = the line where the established low water datum intersects the shore.

low water neaps = neap low water (the average height of the low waters of the neap tide).

low-level consumer = a fish that feeds near the bottom of the food web in its community. In fishes the food may not be entirely restricted to plants (a first-level consumer, *q.v.*).

low-opening trawl = a bottom trawl designed to capture demersal species.

lowe = 1) low.

lowe = 2) a torch used by fish poachers or the light cast by a poacher's lantern. See also low.

lower articular = retroarticular (the triangular, endochondral, dermal or mixed origin bone on the back, hind corner of the lower jaw. Often called the angular, Bridge' ossicle *a* or angulo-retroarticular).

lower course = bream zone (a European river classification system based on species, in this case the cyprinid *Abramis brama*, as characteristic; a sludgy bottom of silt and sand with much macrophyte growth).

lower high water = the lower of the two high waters of any tidal day.

lower jaw-fork length = the straight distance from the tip of the lower jaw to the fork of the tail; used for billfishes.

lower jaw length = measured from the anterior tip of the lower jaw to the posterior angle.

lower low water = the lower of two low waters of any tidal day where the tide exhibits mixed characteristics.

lower limb = the horizontal portion of gill arch or interopercle.

lower panel = net sections on the underside of a trawl.

lower pharyngeal bone = the fifth ceratobranchial, especially that in Cyprinidae and relatives, which is strengthened and tooth-bearing. Also called infrapharyngobranchial dental plate.

lower reach = lower course.

lower risk = in the IUCN Criteria for threatened species, a taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Abbreviated as LR. Taxa included in the Lower Risk category can be separated into three subcategories: 1) Conservation Dependent (cd). Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation programme targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years, 2) Near Threatened (nt). Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable and 3) Least Concern (lc). Taxa which do not qualify for Conservation Dependent or Near Threatened.

lower river = lower course.

lower wing = a trawl net section extending forward from one side of the belly and usually joined to the adjacent top wing (two panel trawls) or adjacent side wing (four panel trawls).

lowhead dam = a dam extending across a river of low height, usually 15 feet (about 5 metres) or less. It impounds the water behind it, has minimal effects on the downstream regime and allows water to fall over its whole width. Quite dangerous as boaters and swimmers may not see it until too late and can be caught in the backwash beneath the dam. Also called channel dam or run-of-the-river dam.

lowholed = angler slang for when another angler steps in front of you or positions their boat in front of your boat.

lowland river = a river characterised by a muddy bottom with many rooted plants, slow and meandering.

lowp = lippie.

lox = locks.

lozenge trawl = a midwater trawl with four seams running from the middle of the head, foot and side ropes instead of from the wing end points.

LR = lower risk.

LRP = limit reference point ( indicates the limit beyond which the state of a fishery and/or a resource is not considered desirable. Fishery development should be stopped before reaching it).

LT<sub>50</sub> = 1) temperature lethal to 50% of an exposed population (or where 50% survive).

LT<sub>50</sub> = 2) lethal time (the time over which an administered chemical will result in the death of half the fish for a given dose).

LTPY = long-term potential yield ( the largest average harvest that can be taken from a fish stock on a sustainable basis, allowing for variable environmental conditions).

lucie = a pike (*Esox lucius*) as used in heraldry. Also spelled lucy.

luciferase = an enzyme concerned in bioluminescence, speeding the conversion of luciferin to oxyluciferin to produce light.

luciferin = a substance concerned in bioluminescence, being oxidized in the presence of the enzyme luciferase to produce oxyluciferin and light.

luciferous = light producing, bioluminescent.

lucky words = words used by fishermen only at the haaf or deepsea fishing.

lucy = a pike (*Esox lucius*) as used in heraldry. Also spelled lucie.

lud tow = end rope (a line connecting the end of the first or last section of a longline backrope or string to the dan line (all q.v.). Also called back of line, dumb string, longline, dummy, end tow and spreadline).

lug = 1) belly flap (a loose piece of skin and flesh hanging from fish ribs in fish preparation). Also called lug flap and wing.

lug = 2) a loop on the end of fishing line.

lug = 3) a marine worm (*Arenicola piscatorium*) used as bait.

lug = 4) a projection, from the Middle English for earflap; now slang for the ear.

lug bone = the bone at the shoulder of a fish that forms the leading edge of a belly flap, q.v., in preparing fish as food. Also called collar bone, nape bone and shoulder bone.

lug fin = the fin of a fish nearest the ear.

lug flap = lug.

lug stane = a stone attached to the lower side of a herring net for the purpose of making it sink (Banff dialect).

lug steen = lug stane.

lug wing = lug (1).

lugger = small fishing boat rigged with one or more lugsails.

lum = lioom.

lume = lioom.

lumbar = pertaining to the hind upper surface of the pectoral fin in Rajidae.

lumen = 1) the cavity of any organ, duct or sac.

lumen = 2) a measurement of light intensity (1 lumen=10.76 lux).

lumie = lioom.

luminous organ = a light producing structure or photophore, q.v.

lumper = 1) a scientist who engages in lumping.

lumper = 2) a helper in the cod fishery of Newfoundland, either at sea or on shore.

lumpfish caviar = the eggs of *Cyclopterus lumpus* (Cyclopteridae) as caviar.

lumping = combining taxa where minor variation is deemed insufficient for species recognition. Others would disagree and believe that the taxa are distinct. The converse is splitting.

lunar day = in describing tides, the time of rotation of the Earth with respect to the moon, or the interval between two successive upper transits of the moon over the meridian of a place. The mean lunar day is approximately 24.84 solar hours in length. Also called tidal day.

lunar tide = that portion of the tide attributed directly to attraction to the moon.

lunate = crescent-shaped, moon-shaped.

lunger = longer.

lunker = a very large bass (*Micropterus* sp.), walleye (*Stizostedion vitreum*) and muskellunge (*Esox masquinongy*) and, by extension, any large sport fish.

lunker lure = buzzbait (a spinner designed to make a disturbance in the water's surface by means of rotating blades).

lunula = the exposed portion of a scale when it is in its natural position.

lunule = a crescent-shaped body part or marking, e.g. colour on scales.

lure = 1) to attract.

lure = 2) a general term for artificial devices meant to attract fish to strike; usually imitating fish or other prey, or providing flash and movement that stimulate a strike.

**lure** = 3) a device attractive to fish, usually excluding artificial bait and artificial flies. May even be leaves or bunches of grass strung on a line, for example - fish are attracted perhaps by a need for shelter, for food associated with the line, for orientation, or by low-frequency vibrations that the line generates.

**lure** = 4) a natural structure attractive to fish, e.g. the modified mantle of mussels or clams which resembles a small fish, and thus attracts a larger, predatory fish. The larval glochidia of the mussel can then attach to the predator as it tries to strike the lure.

**lure line** = lure (2).

**lure retriever** = a heavy device of various designs slid down the fishing line to knock the lure loose when snagged.

**lute fish** = lutefisk.

**lutefisk** = a Scandinavian "delicacy", cod or ling treated with lye, served hot with potatoes, pork or bacon drippings, melted butter, pepper and mustard. The fish is washed repeatedly to remove the lye; very strong smell, likened to that of a sewer, cf. surströmming. See also berndfisk.

**luum** = lioom.

**lymph nodes** = absent in fishes. Phagocytic cells however are found in the gill lamellae and the endothelial lining of the heart atrium.

**lymphatic heart** = a structure at the base of the caudal fin communicating with the lymph vessels and the caudal vein.

**lymphocystis disease** = cauliflower disease (a mildly-infectious viral disease (*Lymphocystis*) of eels and higher aquarium fishes (not cyprinids and catfishes) causing enlarged cells forming lesions on the jaws, and also on fins and skin. The lesions can coalesce to form a cauliflower shape. There is no known treatment and the lesions eventually disappear).

**lyre** = a grade of isinglass (the glutinous or gelatin-like fluid prepared from the collagen of the outer layer of gas bladders of sturgeons or other fishes. Used in clarifying wines and beers, for jams and jellies, in printing inks and as an adhesive cement).

**lything** = fishing for lythe or pollock (*Pollachius virens*).

## M

**M** = instantaneous rate of natural mortality (when natural and fishing mortality operate concurrently it is equal to the instantaneous total mortality rate, multiplied by the ratio of natural deaths to all deaths (Ricker, 1975). Also called force of natural mortality).

**m** = 1) annual mortality rate (the ratio between the number of fish which die during a year from causes other than fishing and the number alive at the beginning of that year. Also called annual

natural mortality rate, conditional natural mortality rate, seasonal natural mortality rate). Also abbreviated as n.

m = 2) conditional fishing mortality rate (the fraction of an initial stock which would be caught during the year (or season) if no other causes of mortality operated (Ricker, 1975). Also called annual or seasonal fishing mortality rate).

m = 3) metre (1.094 yd).

*m* = 1) abbreviation for *mihi*.

*m*. = 2) m (2).

*m.* = 1) abbreviation for muscle.

*m.* = 2) abbreviation for *musculus* (muscle).

*m.* = abbreviation for *mihi*, meaning belonging to me, of me (as of authorship of a new species, or used to show the writer's responsibility for a statement or proposal).

(m) = male.

M74 syndrome = mortalities in Baltic Sea Atlantic salmon stocks appearing first in 1974. Mortalities occur just prior to end of yolk absorption and caused by pollution or vitamin-deficiency.

m.s.l. = mean sea level.

Ma = abbreviation for million years ago.

maak = milk, *q.v.* (Scottish dialect).

maceration = the softening of tissue in various solutions prior to its removal from bones, a technique in osteology.

Machilipatnam = literally Fish Town, a port on the Coromandel Coast of India named for the local industry.

mack = mackerel (2).

Mackenzie River dory = a river fishing boat with a flat bottom, rigid hull and upswept prow about 14-18 feet long. Also called drift boat.

mackerel = 1) *Scomber scombrus*, derived from the French *maquereau*, a word also used for pimp and, anecdotally, for the fish which leads female shads to their mates in spring.

mackerel = 2) the ban on cigarettes in U.S. prisons led to the use of small packets of shrink-wrapped mackerel as currency. Each packet is worth a dollar and reputedly tastes awful.

mackerel bob = a four-pointed fish gig for catching mackerel.

mackerel box = a mackerel nursery area around the south-west peninsula of England and part of the Celtic Sea within which directed fishing for mackerel by purse seiners and pelagic trawlers is prohibited.

mackerel breeze = a breeze that ruffles the water and favours the catching of mackerel.

mackerel cloud = mackerel sky.

mackerel cry = a street vendor's cry announcing mackerel for sale (obsolete).

mackerel flecks = mackerel clouds.

mackerel fly = an artificial fly used to catch mackerel.

mackerel gale = a strong breeze that ruffles the water and favours the catching of mackerel (obsolete).

mackerel plough = a knife used to crease the sides of poor-quality mackerel in order to improve their appearance.

mackerel sky = a type of altocumulus clouds, indicating moisture and instability; hence the saying "Mackerel sky, mackerel sky, Never long wet and never long dry". Presumably named for the wavy pattern as seen on mackerel flanks.

mackerel snapper = derisory or semi-humorous comment on Catholics who eat fish on Fridays (U.S.A.).

mackerel snatcher = mackerel snapper.

mackerel style split fish = fish that have been split along the back, leaving the backbone in place. Can then be laid flat in barrels.

mackerel tabby cat = a cat with characteristic, gently wavy bars on the flank, reminiscent of the fish pattern. The most common tabby pattern. Also called fishbone tabby.

mackereler = 1) a person who goes mackerel fishing.

mackereler = 2) a boat used in mackerel fishing.

macro- (prefix) = large, long, great.

macrocentric scale = replacement scale (a scale which has formed in the place of a lost scale). The centre portion of a replacement scale is equal in size to the one lost but lacks ridges and radii. Not useable for aging purposes. Also called regenerated or latinucleate scale.

macrocephaly = abnormal enlargement of the head.

macroclimate = the climate of a major geographical region.

macrofauna = large animals, including fishes.

macrogamete = the female gamete, larger in size than the male gamete.

macrohabitat = rivers or lakes in fresh waters, cf. mesohabitat and microhabitat.

macroincrement = growth increments more than 50 µm in otoliths or other structures used in ageing, observable with a binocular microscope and used to describe seasonal increments.

macromelanophore = a normal-sized melanophore or brown-black pigment cell, relatively large compared to a micromelanophore (q.v.).

macrophagous = adjective for macrophagy.

macrophagy = eating large pieces or organisms, e.g. *Esox lucius* (Esocidae).

macrophthalmia = 1) swollen or enlarged condition of the eyes, sometimes attributable to parasites or physiological irregularities.

macrophthalmia = 2) that stage of development in *Anguilla* where the eyes enlarge, the body becomes silvery, usually in preparation for migration.

macrophyte = a large plants, used especially for aquatic plants.

macrophytophagy = feeding on large plants.

macroplankton = members of the plankton about 1 mm in length.

macrosmatic = forms with well-developed olfactory sense, e.g. most Elasmobranchii, Anguilliformes. Opposite of microsmatic, q.v.

macula (plural maculae) = photophore, spot, blemish, blotch, splodge, stain.

macula neglecta = a sensory structure located in Teleostomi in the utriculus of the inner ear near the opening of the ampulla of the posterior vertical semicircular canal, in selachians within a duct (posterior canal duct) through which the posterior vertical semicircular canal connects with the sacculus, while in the batoids it lies in the wall of the sacculus adjacent to the opening of the duct. It may have a neuromast associated with its sensory tissue. This structure has been demonstrated to be a sensitive vibration receptor in *Raja*. Also called crista neglecta, crista quarta, or papilla neglecta.

macula bucca = a photophore above the hind end of the upper jaw in Myctophidae. Abbreviated as Bu.

macula cervicis = a photophore at the upper end of the gill cover where it meets the lateral line in Myctophidae. Abbreviated as Ce.

macula suprapectorialis = a photophore above the base of the pectoral fin in Myctophidae. Abbreviated as PLO.

macula supraorbitalis = the photophore on the posterodorsal border of the orbit in Myctophidae. Abbreviated as Suo.

macula supraventralis = a photophore above the ventral fin in Myctophidae. Abbreviated as VLO.

maculae = plural of macula.

maculae anales anteriores = a row of photophores along the base of the anal fin and lower side of the caudal peduncle (not including the Prc's at the base of the caudal fin) in Myctophidae, the AOa row is mostly above the anal fin base.

maculae anales posteriores = a row of photophores along the base of the anal fin and lower side of the caudal peduncle (not including the Prc's at the base of the caudal fin) in Myctophidae, the AOp is mostly on the caudal peduncle.

maculae branchiostegae = photophores along the lower jaw of Myctophidae. Abbreviated as BR.

maculae opercularis = photophores on the gill cover, one near the anterior base of the preopercle, one in front of the anterior part of the subopercle, and one antero-dorsally to the operculum. Abbreviated as OP.

maculae posterolaterales = ventrolateral photophore(s) above the AO series which lie along the base of the anal fin but below the lateral line in Myctophidae. Abbreviated as Pol.

maculae praecaudales = photophore(s) on the lower half of the caudal peduncle at the base of the caudal fin in Myctophidae. Abbreviated as Prc.

maculae pectorales = a row of photophores on the breast in front of the pelvic fin in Myctophidae. Abbreviated as PO.

maculae subpectorales = photophores below the pectoral fin and above the PO row in Myctophidae. Abbreviated as PVO.

maculae supraanales = a sloping, ventro-lateral row of photophores above the anal fin origin in Myctophidae. Abbreviated as SAO.

maculae ventrales = a row of photophores on the abdomen behind the ventral fin in Myctophidae. Abbreviated as VO.

mad = 1) plentiful, gathering in large numbers, in reference to fish (Newfoundland).

mad = 2) a square net fixed by four stakes in a river for catching salmon or trout (Clydesdale dialect, Britain). Also called maud.

Madeira = a grade of cod which was light-salted, well-dried, and hard, and eighteen inches long, sold to sack or Madeira ships or to Brazil (the term referred to the quality, not the destination) (Newfoundland).

madrague = an anchored pound net used for tuna in the Mediterranean Sea. Also called tonnara.

maf or Maf = million acre-feet.

maggot = the larva of an insect (bluebottle) used as bait in European angling, e.g. for such cyprinid species as *Abramis brama*, *Cyprinus carpio*, *Rutilus rutilus*. They may be coloured with food dyes (e.g. pinkies) or flavoured. Also called gentles or gents. Maggots become a caster when in a chrysalis form.

magistrate = a red herring (*q.v.*) (Scotland). Also called Glasgow magistrate.

magnet = fish magnet (a moveable electrode used to bring up a school of fish that normally is too deep for a purse seine to catch).

mahi maratib = mahi muratib.

mahi muratib = the Order of the Fish ("fish dignity" in Persian and Arabic), an honorary badge or dignity, shaped like a fish (supposedly *Labeo rohita* in Moghul India). Said to signify youth, bravery, perseverance and strength. Shaped like a golden fish on a pole or as two golden fish hanging from a bow. Reputedly founded by Khusru Parviz, King of Persia (A.D. 591-628), and thence passed to the Moghul Emperors of Delhi and to the Court of Oudh.

mahogany = two parts gin and one part treacle, beaten together; a drink of Cornish fishermen.

maid = young fish of many species.

maiden = 1) a fish (salmonid), whether male or female, which has not spawned, and is maturing to spawn. Also called a virgin.

maiden = 2) a young fish of many species.

Maillard reaction = browning (discolouration of fish, especially of dried or canned products, caused by a deteriorative reaction between amino groups of proteins and carbonyl groups of sugars during storage. There are also flavour changes and loss of some nutritive value. Known also as the non-enzymatic browning reaction).

main channel = main stream.

main fish = the most important fish species in any given situation, e.g. in a catch, a waterbody, a study, etc.

main line = the principal line in a longline from which branch lines depend with hooks attached.

main river = mainstream.

main stem = the largest channel of a stream or river.

main stream = the principal current of a flowing course of water, a river, stream, etc.

maingayic acid = a plant piscicide from *Callicarpa maingayi* (Verbenaceae). Other piscicidal plant chemicals include callicarpone, huratoxin, ichthyothereol, inophyllolide, juglone, justicidin, rotenone, and vibsanine, all q.v.

mainstem = main stem.

mainstream = the largest or dominating stream of a given area or drainage system.

mainstream flow = that part of the flow in a river, for example, that is away from the bottom and surface and is not under the influence of the boundary layer.

maintain = retain (in nomenclature the continued use of a name as the correct one, especially where a taxon has been divided). See also maintenance.

maintainable yield = the largest catch that can be maintained from the population, at whatever level of stock size, over an indefinite period. It is identical to the sustainable yield for populations below the level giving the maximum sustainable yield and equal to the maximum sustainable yield for populations at or above this level.

maintenance = the continued use of, or support for, a correct name in nomenclature. Also called retain.

maintenance food = maintenance ration.

maintenance ration = the amount of food required for life without increase in weight.

mais = mease.

maise = mease.

maize = 1) mease.

maize = 2) sweet corn used as a bait for such fish as carp. When bought dried needs to be soaked or boiled to make it softer. Can be fermented and various flavours added.

major carp = a larger member of the family Cyprinidae, usually referring to those species used in aquaculture. See Chinese major carps and Indian major carps.

major rays = the fin rays counted in describing and identifying a fish. Includes branched rays and one unbranched ray, omits anterior rudiments. See, e.g., dorsal fin ray count for details. Also called principal rays.

makassar = anchovies headed, salted for several days, then mixed with rice, yeast and spices forming a red pickle, and then packed in bottles.

make = making fish, make the fish.

make a blank = blank (an unsuccessful fishing season or trip).

make bawn = to prepare a beach for drying salted cod by making a flat expanse of rocks (Newfoundland).

make fish of one and flesh of another = to show partiality, to make an invidious distinction.

make fish of one and fowl of another = to show partiality, to make an invidious distinction.

make the fish = to dry salt fish by alternate exposure to sun and piling in stacks or faggots to allow moisture inside to diffuse to the surface.

making a set = encircling a school of fish with a net.

making fish = preserving fish by salting and drying as in the cod fisheries of Newfoundland.

malachite green = a dye and fungicide once used in fish farms but now banned as being suspected of causing cancer.

malacophagous = mollusc-eating.

malar = 1) pertaining to the cheek or sides of the head, e.g. malar spines or thorns found in some male Rajidae close to the edge of the disk opposite the eye.

malar = 2) supramaxilla (the dermal bone(s) on the upper side of the posterior end of the maxilla. Salmonidae have one supramaxilla while Sternopychidae have two. Lost in more advanced Teleostei. Also called supramaxillary, surmaxilla, surmaxillary and jugal).

malassol = lightly-salted caviar (malassol is Russian for little salt) but now also used for any high-quality caviar. Salt content should be less than 3%. Russia and some eastern countries (but not Iran or the U.S.A.) allows addition of borax that sweetens the caviar and helps preserve it.

Malawi bloat = a condition similar to dropsy (*q.v.*) seen in cichlids from the East African rift lakes (originally those from Lake Malawi). Progress is more rapid than in dropsy. Fish show lethargy, appetite loss, increase respiration, gasping at the surface, abdominal swelling, with death in less than 3 days. Causes are uncertain but include bacterial infection and poor diet.

male-with-harem family = patriarch/matriarch family (the condition in Cichlidae where the male defends a large territory, which includes multiple spawning sites of several females. Each female assumes the responsibility of her own brood. The male is polygamous, and clear sexual dimorphism is present. This form takes place among cavity brooders).

malleus Weberi = tripus (the fourth of the four Weberian ossicles, *q.v.*, so-named for its three processes. The anterior process joins it to the intercalarium by a ligament, the median process joins it to the third vertebral centrum and the third, posterior process contacts the anterior wall of the gas bladder through a transformator process).

malpigmentation = a major deviation from the normal colouration of the body or part of the body.

mam-ruoc = mam-ruot.

mam-ruot = fermented fish paste made from muscle tissue and intestines (Vietnam).

mam-rusot = mam-ruot.

mammose = juvenile sturgeon.

man = 1) a pile of rocks or pinnacle lined up with another land feature in order to locate a fishing ground (Newfoundland). See also mark.

man = 2) maund (2).

management = in fisheries this term applies to regulations such as catch quotas and closed seasons.

management authority = the legal entity which has been assigned by a State or States with a mandate to perform certain specified management functions in relation to a fishery, or an area, e.g. a coastal zone. Generally used to refer to a state authority, the term may also refer to an international management organisation.

management objective = a formally established, more or less quantitative target that is actively sought and provides a direction for management action, e.g. a percentage reduction in fleet capacity, a competitive income for fishers.

management organisation = an institution or arrangement established (usually between two or more States) to be responsible for activities related to fisheries management, including consultation between parties to the agreement or arrangement, formulation of the fishery regulations and their implementation, allocation of resources, collection of information, stock assessment, as well as monitoring, control and surveillance.

management procedure = a description of the data to collect, the way to analyse it, and the way to translate the analysis into actions.

management reference points = conventional (agreed values) of indicators of the desirable or undesirable state of a fishery resource of the fishery itself. Reference points could be biological, e.g. expressed in spawning biomass or fishing mortality levels, technical (fishing effort or capacity levels) or economic (employment or revenues levels). They are usually calculated from models in which they may represent critical values.

management strategy = narrowly defined as the combination of a particular data collection system, a particular stock assessment technique and a particular harvest control rule and its implementation. Alternative management strategies can be compared against each other via simulation.

management unit = a stock; an independent set of populations recognised for the purpose of management of an endangered species or an exploited species.

mancril = a basket for carrying fish or bait (Scottish dialect).

mand = maund (2).

mandatory change = a change in spelling of a name required by the International Code of Zoological Nomenclature.

Mandatory Inspection List = in food inspection, a list maintained by a government agency in accordance with inspection regulations which identifies imported fish products found to be non-compliant with requirements following an inspection. Imports of products on the list are subject to mandatory inspection. Abbreviated as MIL.

mandible = the lower jaw, used in the sense of a functional unit without respect to the bones and cartilage making up the jaw.

mandible length = lower jaw length (measured from the anterior tip of the lower jaw to the posterior angle).

mandibular arch = the cartilages and bones of the visceral skeleton forming the jaws. The upper jaw elements are the palatoquadrate or pterygoquadrate cartilages, the lower jaw ones Meckel's cartilages and the angular. This is the basic jaw, the primary mandibles, which have several ossification centres in bony fishes. Teeth and dermal bones are later evolutionary additions and are called the secondary mandibles.

mandibular canal = the portion of the preoperculo-mandibular canal (of the cephalic sensory canals) running along the lower jaw.

mandibular cartilage = Meckel's cartilage.

mandibular labial teeth = teeth found just below the infraoral cusp or lamina and just above the lower margin of the disk in lampreys (Petromyzontidae).

mandibular photophores = old name for photophores along the lower jaw.

mandibular pore = one of a series of pores of the head lateral line system found on the under surface of each jaw. Part of the preoperculo-mandibular canal.

mandibular symphysis = the joint between the left and right mandibles at the jaw tip.

mandibular valve = the buccal flap attached to the inside of the lower jaw which helps keep water from flowing out of the mouth during respiration.

mangōroa (long shark) = ika-roa (the long fish in Maori legend that gave birth to all the stars in the Milky Way. Also called mangōroa i ata (long shark in the early dawn)).

mangal = an ecosystem dominated by mangrove and associated mudflats.

mangōroa i ata (long shark in the early dawn) = ika-roa (the long fish in Maori legend that gave birth to all the stars in the Milky Way. Also called mang ō roa (long shark)).

mankin = the joint of a sheet (*q.v.*) of a fishing net (Northumberland dialect).

manta tow = 1) towing a snorkeller behind a boat at a constant speed, the snorkeller holding onto a manta board. The board has hand grips and facilities for recording data. The tows are usually of short duration (e.g. two minutes) allowing the snorkeller to remember observations that are then written down on a sheet attached to the manta board when the boat stops. Usually used to assess reef habitat but can be used to record fishes.

manta tow = 2) a surface sampling net towed behind a boat.

manure = of fish, dried and powdered used as fertiliser in fish ponds to enhance productivity.

manuring = fertilisation (2) in aquaculture, the improvement of water productivity by addition of natural or artificial compounds).

manuscript = a text, either handwritten or typed, but not available in multiple copies. Used for the copy of a scientific paper submitted to a journal for publication. Abbreviated as MS, MSc, MScr or MSS (plural), and all these may be in lower case and with or without a period.

manuscript name = an unpublished scientific name; may be intended for eventual publication or be used in correspondence or in public speech. Has no standing in nomenclature until acceptably published.

marbled = variegated, clouded, dark with lighter, narrow streaks.

marbles = glass marbles are used in aquaria so that fish eggs can fall in the interstices and not be eaten by the parent fish.

merchant = merchant.

mare's nest = a tangled mass of debris in a stream.

margin = the border between the land and a water body.

marginal blastomere = a cell incompletely cleaved before the yolk syncytial layer forms located in the surface layer just at the rim of the blastodisc.

marginal cost of effort = the incremental cost incurred by applying one additional unit of fishing effort.

marginal habitat = a habitat supporting only a few species or individuals because of the limiting environmental conditions.

marginal increment = the region at the edge of a structure used in age determination, a fraction of the last complete annual or daily increment.

marginal membrane = the border of the buccal funnel just inside the oral fimbriae and just outside the toothed area in lampreys (Petromyzontidae).

marginal notes = marginalia.

marginal yield = the increase in yield obtained by an increase in fishing effort by one unit.

marginalia = information recorded in the margin of a document. Also called marginal notes.

marginals = the circle of teeth around the perimeter of the buccal funnel of a lamprey (Petromyzontiformes).

marginaria= ligaments that attach otoliths to the chamber wall and transmit movements to the brain, helping to maintain equilibrium.

mariculture = marine cultivation or aquaculture of organisms in tanks, pens, ponds or cages or net enclosed areas in the open sea. Fish are usually raised to market size; a marine hatchery is also a mariculture facility but fish are usually released as young.

marigram = a graphical record of the rise and fall of the tide.

marinade = acidified brine, acetic acid, olive oil or vinegar with or without spices in barrels or special containers in which fish are soaked. The cured fish are packed in mild acidified brine variously with spices, sugar, wine, vegetables and flavourings, e.g. rollmops, Bismarck herring. Salt helps firm the flesh. Chilled marinades have a shelf life of 1-2 months, canned marinades much longer. The pH must not exceed 4.5 as below this spoilage does not occur and food poisoning bacteria do not grow. However some bacteria and enzymes are active and aid ripening, contributing to texture and flavour. Cold marinades are preserved by their acid and salt content, cooked marinades by this and by heat or pasteurisation.

marinate = to soak in a marinade.

marine = pertaining to the sea (not large lakes as sometimes used).

marine boundary = the mean lower low water line when used as a boundary.

marine farming = aquaculture in the sea.

marine mucilage = gelatinous masses of mucus produced by stressed plankton, up to 200 km long. Overfishing, pollution and climate change have all been blamed.

marine refuge = an area protected against fishing. This may be a refuge from which commercial stocks are replenished.

marine reserve = an area of the sea set aside for the protection of organisms such as fishes and/or for their scientific study.

marine salt = a complex mix of salts used to imitate sea water for a marine aquarium. Not to be confused with aquarium salt, q.v.

marine snow = organic particles and dead organisms that sink into the deep sea where they form a basis for life without sunlight. Also called plankton rain.

marine survival rate = the portion of a migratory population that survives the open-ocean phase.

marine transgression = land flooded by the sea as land sinks or sea level rises.

marinist = a scientist who studies the sea or an expert in maintaining aquaria (rarely used and not in dictionaries as of 17 June 2006).

mark = 1) an area of sea with good fishing, located by landmarks.

mark = 2) a region of similar structure or optical density laid down during growth of hard parts used in ageing. Also called band, ring and zone.

mark = 3) any sign on or in a fish enabling it to be distinguished from other fishes. Excludes tags which are artificial objects.

mark = 4) the act of applying a tag, *q.v.*

mark = 5) a land feature which, when lined up with another one, enabled a fisherman to position himself over a fishing ground. See also mark (1) and man.

mark-recapture study = the tagging, release and recapture of fish to estimate population size, movements, migrations, mortality and growth.

marker = an inert, indigestible chemical added to feed to study digestion.

marked = fish stained, tattooed, dyed, tagged or fin clipped and then released and recaptured for studies of growth, movement, etc.

marked ground = mark (1).

marker buoy = a buoy attached to fishing gear to mark its position in the sea.

marker float = 1) large, brightly coloured floats used to mark a particular fishing area for angling. Usually cast out with an additional rod and reel apparatus, a lead weight on the end of the line, and the float running free. Once tension on the line is released the float surfaces and marks the fishing area.

marker float = 2) one of series of floats used to fix a gillnet at a certain depth.

market = of fish, any area selling fish but usually refers to a large covered establishment with diverse products.

market category = a general grouping of fish at market that is not species determined, rather a general category determined by price per weight.

market glut = too many fishes becoming available, thus straining the resources of buyers, processors and wholesalers and causing prices to drop to very low levels.

market name = a common name assigned to a fish sold for consumption to encourage sales, e.g. spiny dogfish (*Squalus acanthias*, a shark) became rock salmon.

market passage = market run.

market price support = measures that raise prices for fish consumers, e.g. tariffs, tariff quotas, quantitative restrictions, import licensing, etc.

market run = a voyage from the fishing grounds to the point of export, especially a rapid passage under full sail in the past (Newfoundland).

market value = the current value paid for fish of a like kind and quality.

marketable size = the weight an aquaculture product must attain before being acceptable for sale, either legally or by consumer choice.

marking = an identification system involving various methods (fin clipping, colouring, biotelemetry, radioactive markers, tattooing, branding, tagging, etc.), used for individual identification and for studies on movement, growth and other biological studies. Also called tagging.

marlin tower = a low platform in a fishing boat from which spotters look for fish. A high platform is a tuna tower.

marlin-spike = 1) *Nezumia bairdii*, a macrourid fish.

marlin-spike = 2) a tool used in separating and splicing ship's ropes.

marmaid's purse = mermaid's purse (Scottish dialect).

marrow spoon = a long and slender spoon used by fly fishermen to extract stomach contents of fish and thus determine what the fish are feeding on and what artificial fly would be appropriate.

marsh = a type of wetland that does not accumulate appreciable peat deposits and is dominated by herbaceous vegetation. Marshes may be either fresh water or saltwater and tidal or non-tidal.

marsh worm = a type of worm used in angling. Also called blue-head worm.

Marshall's gland = alkaline gland (a paired organ in the genito-urinary apparatus of *Raja* (and probably other skates and rays) whose cavity is fluid filled).

marshy = of or like a marsh.

**marsipobranch** = a purse-gill, consisting of a round cavity or pouch lined with gill lamellae found in Myxini and Petromyzontiformes.

**marsupium** = the name applied to the brood-pouch in Syngnathidae and Solenostomidae. In Syngnathidae it consists of a vascularized groove formed by flaps of skin along the underside of the tail of males (subcaudal marsupium); in Solenostomidae it is a pouch formed by the pelvic fins, provided with many long filaments, and found only in the female (ventral fin marsupium).

**masago** = caviar from *Mallotus villosus* (Osmeridae), usually small eggs, bright yellow to orange in colour.

***masc.*** = abbreviation for *masculus*, meaning male.

**masculinisation** = direct sex reversal by doses of male hormones, e.g. 17a-methyl testosterone, in the feed during the early stages of development. Used for tilapia and catfish farming where males are the desired gender. Also used in female broodstock that then produce sperm with homogametic (XX) chromosomes which then produce an all-female cohort when crossed with normal eggs.

***masculus*** = male or masculine. Abbreviated ***masc.***

**mash** = a mixture of ground feedstuffs for fish in aquaculture.

**mashin** = 1) catching or netting fish (Scottish dialect).

**mashin** = 2) a catch of herring (Scottish dialect).

**mask** = 1) the mesh of fish net (English and Scottish dialect).

**mask** = 2) to enmesh or catch fish in a net, to swim into a net and thus trap themselves (Scottish dialect).

**masoten** = dylox (0-0-dimethyl-2,2,2-trichloro-1-hydroxy-ethyl phosphonate, an insecticide used in control of parasitic copepods. Also called dipterex).

**mass marking** = making all individuals in a population of fish so that individuals can be identified later in their life history.

**master** = master of the fishery.

**master float** = a float attached to the distal end of the fleet end rope used to locate the gillnet fleet end.

**master of the fishery** = the man in charge of a fishing crew and the operations involved in catching and processing fish (Newfoundland).

**master of the seine** = seine master (a man in charge of a boat and crew fishing with seines).

**master sinker** = a heavy weight attached to the gillnet fleet end to control drifting.

masula = a large, open boat used on the east coast of India for operating shore seines and steered by a paddle sweep.

mat = a surface layer of algae. Also called scum.

mataeonym = an unofficial term in nomenclature for a superfluous name introduced when there was an older valid name based on the same type (typonym, q.v.) or on another member of the same group (metonym, q.v.).

matanza = a slaughter, used for the traditional fishery for bluefin tuna in the Mediterranean.

match fishing = competitive coarse fishing in Britain with a peg (fishing spot) selected randomly for each angler, a time limit and rules. Usually the maximum number or weight of fish caught wins the match. Since there are many more small fish than large ones, the effort may be designed to catch large numbers of small fish, often at a rate of a fish every 20 seconds using very fine lines and minute hooks.

match reel = a very light reel that has a special spool taking only the amount of line to be used (100-150 m).

match rod = strong but light fishing rods made of carbon fibre and up to 15 feet long.

matching the hatch = an angler's attempt to choose an artificial fly that resembles natural insects hatching and being fed on selectively by fish. Also called imitative flyfishing.

matelotte = a French fish stew made with wine, sometimes thickened with cream and egg yolks (Alsacia) or with cider and Calvados (Normandy).

material = the specimens available for a taxonomic or systematic study.

Material Safety Data Sheet = documents from the manufacturer of a chemical outlining its toxicity, volatility, flammability and other safety related information. Posted in laboratories where such chemicals are used; formalin is probably the commonest and most toxic chemical encountered by ichthyologists. Abbreviated as MSDS.

maternal histotrophe = histotrophe (ovarian or uterine milk, a secretion produced by teleost livebearers for absorptive feeding during fish ontogeny).

matfull = a herring that is full of eggs as opposed to one that is spent.

Mathsyendranath = incarnation of Vishnu as a fish in Hindu mythology.

matje cured herring = matje herring gutted, rinsed, mild cured and packed in barrels filled with blood pickle at 80° brine strength.

matje herring = young fat herring with gonads slightly developed or undeveloped, i.e. caught early in the season (from the Dutch for virgin).

matriarch/patriarch family = the condition in Cichlidae where the female watches over the brood, while the male defends the territory. When the fry become free-swimming, the parents bear the tasks of parenthood equally. This family form is usually formed by monogamous, open-water brooders. Sexual dimorphism and dichromatism is common. See also patriarch/matriarch family.

matriachal family = the condition where no bond is formed between a spawning pair. The female cares and guards the eggs and the fry, e.g. in some Cichlidae. In this family pattern, the fish are agamous, and usually the female is an ovophile mouthbrooder.

matriclinous = matroclinous.

matrix-rich zone = D-zone (that part of a micro-increment of an otolith that is dark in transmitted light or is a depressed region when acid-etched and seen with a scanning electron microscope. It has more organic matrix and less calcium carbonate than the L-zone, *q.v.* Also called discontinuous zone).

matroclinous inheritance = the hereditary mechanism resulting in only the chromatin of the mother being passed on to the offspring which are all daughters. Also spelled matriclinous.

matronym (adj. matronymic) = a scientific or common name dedicated to a female person. See also patronym.

matronymic = adjective for matronym.

matrotrophic viviparity = internal fertilisation of eggs with the mother providing some nutrition to developing embryos and with the young born as larvae.

matrotrophy = provision of nutrients from the mother throughout embryonic development, e.g. in Poeciliidae. See also placental matrotrophy.

matrotrophy index = a measure of prenatal maternal provisioning, determined as the dry mass of an offspring at birth divided by the dry mass of the egg at fertilisation.

Matsya = fish in Sanskrit (मत्स्य) and the first avatar of Vishnu in Hindu mythology, usually represented as a man with his lower half in the shape of a fish.

Mattanza = a Mediterranean tuna trap with leaders over a mile long and a series of large chambers which eventually concentrate the passing school in a killing room. The walls of netting in this last room are lifted up and the tuna gaffed and hauled into boats.

Matthiessen's ratio = the proportion between the distance from the centre of the lens to the retina divided by the radius of the lens in fishes. The proportion is usually 2.55. All fish eyes, therefore, have the same proportions, regardless of size.

mattie = hard salted herring of a certain size range.

maturation = becoming adult and sexually mature.

mature individuals = the number of individuals known, estimated or inferred to be capable of reproduction. Excludes adult fish that are incapable of reproduction because of environmental or behavioural reasons.

mature river = a river with a less steep gradient, more discharge and a slower flow than a youthful river, many tributaries and its channel erodes wider than deeper. See also youthful, old and rejuvenated rivers.

maturing pond = a pond where broods are kept before spawning while maturing.

maturity = fish of a given age/size capable of reproduction; attainment of first spawning.

maturity coefficient = the weight of the gonad as a percentage of the weight of the whole body, or the gutted body weight.

matutinal = relating to the morning.

Matsyendra = one of the Vishnu's incarnations as a fish, first Avatar of the Dasavatharas or Matysa in Hindu mythology.

maud = mad (2).

maun = maund (2).

maund = 1) 4 kg or about 9 pounds, used in the Persian Gulf for fish weights in the market.

maund = 2) a basket or hamper. Those used for herrings were made of osiers and were open-ribbed; other were used for catching salmon. A big maund held about one hundredweight. Also spelled man, mand, maun and mawn.

maund basket = maund (2).

maund basketful = about 350 herrings, or if a larger size basket, 600 herrings.

maut = a male salmon at spawning time (Scottish dialect).

Mauthner's xon (neuron) = one of the two giant neurons linked to parts of the acoustico-lateralis, optic, and cerebellar systems, and to somatic motor neurons by way of decussating (intersecting) giant nerve fibres that run the length of the spinal chord. This short circuits ordinary reflex paths and provides the rapid and co-ordinated response of swimming muscles for rapid escape. Found in larvae of Petromyzontidae, in Holocephali, Teleostomi and in tadpoles and aquatic urodeles, absent in Selachii and Rajiformes.

mauvie = the maw of a fish (Caithness dialect).

maw = 1) the dried stomach or swim bladder of a fish used for industrial or culinary purposes.

maw = 2) the mouth, stomach, jaws, or gullet of a voracious animal, presumably including the larger fishes.

maw bladder = gas bladder (a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, sound receptor, respiratory organ. Found in Actinopterygii. Often lacking in bottom fishes. Also called swimbladder).

maw-mouth = 1)a fish with a large mouth.

maw-mouth = 2) a braggart, loud talker or boaster.

mawn = maund (2).

max = abbreviation for maximum.

maxilla (plural maxillae) = the dermal bone forming part of the upper jaw, displaced inwards by the premaxilla in more modern Teleostei. It may bear teeth. Also called maxillary which is also the adjective.

maxillae = plural of maxilla.

maxillar cartilage = palatoquadrate (the cartilaginous, functional upper jaw of Elasmobranchii and Holocephali and the embryonic upper jaw of other gnathostome vertebrates. In adult Dipnoi, Crossopterygii and Actinopterygii, produces the autopalatine, metapterygoid and quadrate bones. Also called palatoquadrate or palatoquadratal bar, palatoquadrate cartilage, pterygoquadrate bar, epimandibular cartilage and maxillar cartilage).

maxillary = 1) maxilla.

maxillary = 2) adjective for maxilla.

maxillary extension = an expression of relative mouth size measured with the mouth closed. When the mouth is open the maxilla is displaced forwards in relation to the eye, and it is the extension of the maxilla in relation to the eye that is used to describe mouth size.

maxillary length = greatest length of that bone. Often misapplied to the length of the whole upper jaw when the upper jaw includes the premaxilla.

maxillary valve = the buccal flap attached to the inside of the upper jaw which helps keep water from flowing out of the mouth during respiration.

maxillo-infraorbital = a paired bone ossifying from the lower orbit (corresponding with the jugal) and ventrally close to the mouth edge.

maxillo-mandibular ligament = a ligament intimately involved with the adductor mandibulae muscles. It attaches to the proximal end of the maxilla, the opposite end attaches to the angular bone near the quadrate-articular joint and a third deeper part attaches to the coronoid processes of the dentary and the angular bones and then passes to the lower jaw. Adductor

mandibulae (part 1) inserts at the centre of the ligament and part 2 and part 3 insert beneath and medial to the insertion of part 1.

maxillomandibular = a small, rounded, dorsoventrally compressed bone in Neostethidae lying in the maxillomandibular ligament near the tip of the lower limb of the premaxillary.

maximum constant yield = the maximum constant catch sustainable for all probable future levels of stock biomass.

maximum economic performance = a fishery producing the maximum amount of economic benefits; the sum of net benefits to fishers and consumers, and resource rent.

maximum economic yield = the total amount of profit that could be earned from a fishery if it were owned by an individual; the yield above which the revenue generated by a marginal increase in effort is less than the cost necessary for the attainment of that increase. May be measured in dollars or weight. Abbreviated as MEY.

maximum equilibrium catch = maximum sustainable yield. Abbreviated as MEC.

maximum fishing mortality threshold = the rate of fishing mortality, that if exceeded, will result in overfishing and jeopardize the capacity of a stock to produce maximum sustainable yield on a continuing basis. Abbreviated as  $F_{threshold}$ .

maximum potential yield = the largest harvest that can be maintained from a population or area under optimal population and environmental conditions.

maximum spawning potential = spawning potential ratio, *q.v.*, or % MSP (the ratio of spawning potential per recruit under a given fishing regime relative to the spawning potential per recruit with no fishing).

maximum standing crop = maximum abundance of fish sustainable by a water body without loss or gain in weight taking into account natural or artificial food availability.

maximum sustainable yield = the average or maximum catch that can be removed under existing environmental conditions over an indefinite period without causing the stock to be depleted, assuming that removals and natural mortality are balanced by stable recruitment and growth. In fisheries, this method was an effort to take all the fish that the fishery could supply on a continuous basis. However it did not work out on a practical basis as good years were mixed with bad years (more or less production than the simple theories predicted) and prediction of the maximum sustainable yield was difficult. Overestimates or a series of bad years will cause a fall in biomass. The fishery will have to be reduced while the stock recovers. More conservative methods are now used (see optimum sustainable yield). Abbreviated as MSY or  $Y_s$ . Also called maximum equilibrium catch, maximum sustained yield, sustainable catch.

maximum sustained yield = strictly this is the yield that can be sustained without depletion of the stock. Maximum sustainable yield is then the maximum catch that can be made per unit time under the appropriate fishing rate, and presumably cannot be sustained indefinitely.

maximum yield-per-recruit = maximum expected lifetime yield per fish recruited in the stock.

May parr = a salmon parr before it descends the river as a smolt in May (Scottish term).

maze = 1) to have the maze is said of herrings about to shoot the roe (British dialect).

maze = 2) mease.

mazy herring = the highest brand of herring, full of roe.

mbipi = haplochromine cichlids endemic to Lake Victoria, the equivalent of Lake Malawi's mbuna.

mbuna = the African word for "rockfish", a group of colourful, herbivorous, reef-dwelling haplochromine Cichlidae in Lake Malawi.

McAllister = the son of Alister, the Gaelic for Alexander.

McFish = Filet-O-Fish (a MacDonald's fish sandwich introduced in 1963 to combat declining sales on Fridays, a non-meat eating day for certain Christians. Also popular with Muslims who cannot eat haram meat. Also called FishMac).

MCS = monitoring, control and surveillance.

Md = a row of photophores on the mandible in Myctophidae.

meal = dried fish or fish waste used as fertilizer, animal food or ground fine for use in soups. May be defatted, and is powdered or granular in form.

meall-fish = fish paid as rental in kind (Scottish dialect).

mean biomass = the product of mean abundance (numbers) and the average weight of individual fish. The former is calculated from abundance at the beginning of the year and the annual mortality rate and the latter are derived from population size and weight at age data.

mean generation time = the average time it takes for a sexually mature female to be replaced by an offspring with the same reproductive capacity.

mean high water = the average elevation of all high waters recorded at a particular station, usually over 19 years. Shorter terms may be used but are readjusted to eliminate variability and give a result equivalent to the 19-year value. All high water heights are included in the average where the type of tide is either semidiurnal or mixed. Only the higher high water heights are included in the average where the type of tide is diurnal (in which case mean high water is the same as mean higher high water).

mean higher high water = the arithmetic average of the elevations of the higher high waters of a mixed tide over a specific 19-year period.

mean high water springs = the average height of the high water occurring at the time of spring tides.

mean low water = the average height of the low waters over a 19-year period. Shorter terms may be used but are readjusted to eliminate variability and give a result equivalent to the 19-year value.

mean low water springs = the average height of the low waters occurring at the time of the spring tides.

mean lower low water = the average height of the lower low waters over a 19-year period. Shorter terms may be used but are readjusted to eliminate variability and give a result equivalent to the 19-year value.

mean range of tide = the difference in height between mean high water and mean low water.

mean rise of the tide = the height of mean high water above the plane of reference or datum of chart.

mean sea level = the mean surface water level determined by averaging heights at all stages of the tide over a certain period, usually a 19-year period. Usually determined from a fixed predetermined reference level or chart datum.

mean tide level = half-tide level (plane midway between mean high water and mean low water).

mean water = the average discharge of a river.

mean water level = the mean surface level as determined by averaging the heights of water at equal intervals of time, usually hourly.

meas(e) = 1) a measure used in counting herrings of varying quantities. Usually about 500-620 herrings and may be accurately 612 fish. Also spelled mais, maise, maize and maze.

mease = 2) the wooden box or basket in which herrings are packed.

measure = 1) the act of unloading herring and assessing that boat's catch (Scottish dialect).

measure = 2) a small catch of herring (Scottish dialect).

measure of the fish = the length-height ratio of the vesica piscis, q.v., as expressed by Pythagoras is 153:265, a mystical number.

measurements = see morphometric characters.

meat = the flesh of animals used as food. Not generally applied to fish but does occur, e.g. shark meat.

meat ball = a small school of bait fish that form a ball in the water as an instinctive response to a predator. Also called bait ball.

meat fish = mete fish.

meat hole = angler slang for a place where fishing is very good and easy, attracting many anglers.

meath(e) = meese.

meatus = channel, canal, way, opening.

MEC = maximum equilibrium catch.

mechanic(al) narcosis = stunning fish for food by vibrations. Clubs can be used to bang on ice of the appropriate thickness (not too thick and slightly brittle) to stun fish just below, or on rocks to stun fish hiding underneath them. Thrown objects from rocks to boomerangs used to stun fish would also fall in this category as would bullets (meant to stun not hit) and explosives.

mechanical brining = brining (*q.v.*) fish with mechanical conveyors and/or pumps and controls.

mechanical filtration = elimination of particulate matter in aquaria, e.g. by means of polyester pads.

mechanical intensity of fishing = fishing effort (the total fishing gear in use for a specified period of time; when two or more kinds of gear are used, they must be adjusted to some standard type before being added, or effective fishing effort, abbreviated as *f* or *f* (Ricker, 1975)).

mechanical jigging machine = an automatic device that jigs with line and hooks.

mechanical method = in nomenclature, any method of selecting a type automatically, e.g. the first species method (*q.v.*). Not now an accepted means of typification.

mechanically recovered fish flesh = the flesh of a fish separated from skin and bones by mechanical means (see bone separator). Also called minced fish, recovered flesh, recovered fish flesh, boneless fish meat and deboned fish.

mechanised pole line = an automatic fishing line and pole which moves the hook up and down while fishing, brings the captured fish onboard, releases it from the hook, baits the hook and redeploys it in the water, e.g. in tuna fishing.

mechano-receptor = organs allowing fish to sense currents and its own movements, mainly in the lateral line system.

Meckel's canal = Meckel's foramen.

Meckel's cartilage = the functional lower jaw of Elasmobranchii and Holocephali, the embryonic lower jaw of other gnathostomous vertebrates which ossifies at least in part as the mentomeckelian, mediomeckelian, coronomeckelian, articular and retroarticular. It remains in some adult fishes as a pointed rod embedded in the dentary and angular. Also called mandibular cartilage, ceratomandibular cartilage or primary mandible. See also Bridge's ossicles.

Meckel's foramen = when not completely surrounded by dermal bone, Meckel's cartilage is visible on the medial face of the lower jaw, e.g. some Sarcopterygii. Also called Meckel's or Meckelian canal, groove and fossa although groove is usually used in tetrapods.

Meckel's fossa = Meckel's foramen.

Meckel's groove = Meckel's foramen.

Meckel's ossicle = sesamoid articular, sesamoid angular or coronomeckelian (a small bone on the internal surface of the articular bone of the lower jaw. Often a point of insertion of the adductor mandibulae muscle).

Meckelian canal = Meckel's foramen.

Meckelian fossa = Meckel's foramen.

Meckelian groove = Meckel's foramen.

medial = towards the vertical plane running through the middle of the body (the sagittal plane). Opposite of lateral.

medial plate = innominate bone (the pelvic fin bone in Gasterosteidae, sometimes a misnomer for the ectocoracoid. Also called pelvic bone, pelvic plate, posterior process and pubic bone).

medial view = a view from the midline looking outward.

median = 1) in or at the middle, situated on the vertical plane running through the middle of the body (sagittal plane).

median = 2) the middle value of the set when they are ordered by rank, i.e. 50% of the values are above the median and 50% are below.

median cerebral vein = one of two veins draining blood from the posterior braincase into the lateral head vein, *q.v.*

median fin = one of those fins located on the sagittal plane of the body, the dorsal, caudal and anal fins. Also called perisopterygium.

median length = fork length (the distance from the most anterior point of the body to the deepest point of the fork in the caudal fin. Abbreviated FL. Mostly used in fishery biology and not in systematics).

median lethal dose = the dose of a chemical which will result in the death of half the fish in a given time period. Abbreviated as LD<sub>50</sub>.

median lethal time = the time over which an administered chemical will result in the death of half the fish for a given dose. Abbreviated as LT<sub>50</sub> (note that LT<sub>50</sub> is also the temperature lethal to 50% of an exposed population (or where 50% survive)).

medicated feed = feed in aquaculture or aquaria with drugs or antibiotics added as a treatment. Often strictly regulated by law.

medicinal fish = various fishes and fish parts have been used in cultures world-wide as perceived cures and treatments for ailments. Numbfish (*Torpedinidae*) applied to the temples cured headaches; sole placed over the site of the spleen helped alleviate splenitis; remoras delayed birth; shark's teeth rubbed across the gums of children helped teething, produced sound incisors and a shark-like appetite; livers were applied topically in various diseases and in treatment of fever and dropsy; red herrings rubbed on the body cured rheumatism; cramps and sprains were cured with an application of fresh eel skin; an eel will cure fever; deafness was cured by a powder of eel's liver; toothache by carrying around a piece of a dogfish that had been returned alive to the sea; jaundice by application of a split tench (which must then be buried; haemorrhages stopped by the brains of fish; whooping cough by putting a live fish in the mouth although it must not be swallowed; and so on.

mediolateral = middle of the side; the horizontal axis oriented perpendicular to both the anterior-posterior and dorsal-ventral axes.

mediolateral intercalation = ordered cellular repacking along the mediolateral axis by interdigitations of deep cells during the gastrula and early segmentation periods producing convergence and extension.

mediolateral photophores = old name for SAO photophores, a sloping, ventro-lateral row above the anal fin in *Myctophidae*.

medioparietal = a skull where the parietals touch on the midline, not being separated by the supraoccipital (as opposed to lateroparietal, *q.v.*).

medithermal = the current climatological conditions, beginning about 4500 years ago.

medium = medium-salted fish.

medium-salted fish = fish cured with 20-28 parts of salt to 100 parts fish by weight; the product contains 30-40% salt on a dry weight basis. Also called half-salted fish.

medium-wire hook = an all-purpose hook made from wire of medium gauge, intermediate between fine-wire and forged hooks.

medular cavity = the first vascular cavity in the median position in long bones such as spiny rays.

medulla oblongata = the hindbrain, equivalent to telencephalon (see brain). The posterior fourth ventricle is the open chamber in its dorsal half, roofed by the tela choroidea.

meed = meese.

meese = the use of the relative positions of landmarks to determine a particular fishing spot at sea (Caithness dialect).

meeth = meese.

mega- (prefix) = large, great, larger than normal.

megafauna = very large animals, mostly whales in water but conceivably some of the larger fishes could be included. See also charismatic megafauna.

megafish = fish large enough to be studied without a microscope.

megagamete = macrogamete.

megaloplankton = the largest members of the plankton.

MEI = morphoedaphic index ( an index of potential fish production in lakes. Calculated by total dissolved solids (mg/l)/mean depth in metres).

meid = meese.

meig = milt (Scottish dialect).

meikotsu = soft bones of elasmobranchs cut into pieces, boiled, then cooled in water. The remaining muscles and hard bone are removed, and then the preparation is boiled again and dried in the sun (Japan). Exported to China.

meio- (prefix) = smaller, less than.

meiolecithal = eggs with a small amount of yolk, e.g. Amphioxus.

meise = a large basket and thence a measure for herrings (Scottish dialect).

meit fish = mete fish.

meith = meese.

meji = young stages of the large species of tunas (Japan).

melamine = a trimer of cyanamide and a metabolite of the pesticide cyromazine. It is used to produce countertops, glues, fabrics, inks, flame retardants, fertilisers and plastics. Melamine was found as a contaminant in wheat gluten from China that was used in pet food and in aquaculture feed in 2007. Melamine can lead to crystal formation that damages the liver among other effects, and cats and dogs have died from the contaminated food.

melan- (prefix) = pigmented, black, ink.

melanin = indole compounds which give skin its black, grey or brown color. In deeper layers of skin under turbid pigment-free layers, melanin may give rise to Tyndall blue colors. Distributed in melanophores. Melanin is formed from oxidized and polymerized end-products from the metabolism of tyrosine and allied phenolic compounds.

melaniridosome = an association of pigment cells consisting of a central melanophore surrounded by guanophores, or covered on its two faces by a syncytium of guanophores.

melanism = overproduction of the dark pigment melanin leading to an abnormal dark colouration. Occurs in nature but artificially bred in aquarium fish species. Melanistic individuals are less robust than the normal fish and are more likely to become blind or develop tumours.

melanistic = dark or blackish.

melanocyte = melanophore.

melanomacrophage centre = found in the liver, kidney and spleen, these structures increase in number during stress or disease.

melanophore = a black chromatophore (capable of producing yellows and brown when pigment is thinly dispersed).

melanosis = blackening, e.g. a symptom of whirling disease (*q.v.*) due to vitamin B deficiency.

melanotic = adjective for melanosis.

melg = the milt of fish (Scottish dialect).

mell = 1) a hammer used for stunning salmon and for casting lots for stations in halve net fishing (*q.v.*) or positions for poke nets (*q.v.*) (Scottish dialect).

mell = 2) a team of halve net fishermen in the Solway, Scotland.

melker = milker herring (Dutch cured herring with the gonads left in the fish. Usually packed in small barrels with about 12 fish for the North American delicatessen trade. Also called Norwegian milker).

mellogarum = garum (*q.v.*) mixed with honey.

melt = milt (in Scottish and English dialect).

meltwater = water from melting ice of a glacier or snow, often with few fish.

membrana branchialis (membranæ branchiales) = opercular membrane (the tissue covering the gills laterally and enclosing (including in some, but not other definitions) the opercle, preopercle, subopercle and interopercle bones. In most Teleostei, where the membranes from each side meet under the head on the isthmus, the left side overlaps the right).

membrane bone = a bone which arises directly from connective tissue membranes without cartilaginous precursors. Includes dermal bones, as opposed to cartilage ones. Membrane bones are thin, laminar and located near the surface of the body. When the connective mesenchyme transforms into bone it does not differ histologically from bone which arose from cartilage. Also called achondral, dermal (*q.v.*), covering and investing bone.

membranopterotic = supratemporal-intertemporal (a dermal bone overlaying the pterotic (or autopterotic). Also called intertemporal or dermopterotic).

membranous labyrinth = the semicircular canals and the appended otosac. The canals and chambers are filled with endolymph and surrounded by perilymph. The membranous labyrinth is enclosed in cartilage in Cyclostomata and Elasmobranchii, in several bones in Teleostomi, the bony labyrinth.

memory = the annoying tendency of fishing line on a spool to take up the spool shape and to come off it in coils that tangle easily and cast poorly.

mend = in fly fishing, throwing an upstream curve in the fly line to compensate for the current so that the fly is presented at the same speed and direction as the current. Trout are very sensitive to food items and artificial flies not moving in tune with the natural flow. Also used in float fishing to keep the float trotting in a straight line.

mended fish = post-spawning fish that have or are recovering.

mending = mend.

menhaden = *Brevoortia tyrannus*, the common name meaning fertiliser in Algonquian as it was so numerous that it was buried in corn fields.

meningost = the lateral ossification of the basisphenoid.

meniscus = a disk of cartilage located in a joint between the surfaces of articulating bones.

mentaiko = spicy, marinated cod roe as served in a sushi restaurant.

mental = 1) relating to the chin. Most common use in fishes, e.g. mental barbel.

mental = 2) relating to the mind.

mental appendage = a fleshy globe or membranous tassel on the tip of the chin; used as an organ of touch.

mental barbel = a barbel on the chin.

mental crest = an outgrowth of the dentary bone of the lower jaw. The crests from each side of the lower jaws converge anteriorly. Also called chin or submental crests.

mental foramen = a hole or channel in the mandible leading to the Meckelian fossa.

mentomandibular = mentomeckelian.

mentomeckelian = the ossified tip of Meckel's cartilage. It fuses with the dentary in most Teleostei but is independent in Cyprinidae. Found in *Amia* and perhaps larval Salmonidae. Also called mentomandibular.

mentum = mental (1).

merchant = an entrepreneur in the Newfoundland cod trade who finances fishing operations through the advance of supplies and credit.

merchantable cod = split, salted and dried cod of a quality suitable for sale as opposed to refuse cod, *q.v.*

merchantocracy = the merchants of St John's, Newfoundland, engaged in the export of cod and the provisioning of fishermen.

mercury contamination = many fish species, both freshwater and marine, caught by sport fishermen are contaminated by mercury. Advisory levels for consumption are issued by government agencies.

mere = a small lake, pond or marsh, usually a sheet of shallow standing water (Saxon). Other definitions have a mere as a small, deep piece of water, especially if a river runs through it.

merey = full of fens or small sheets of shallow water.

meristic = pertaining to serially repeated structures, e.g. scales, vertebrae, fin rays, fin spines, other spines, myomeres, photophores, scutes, finlets, branchiostegals, and also to other structures that can be counted, e.g. pyloric caeca, etc. Also used as a noun and usually in the plural.

meristogram = a graph showing the variation in the number of meristic characters between specimens and populations.

mermaid = a mythical piscine humanoid, the upper portion being that of a female human, the lower that of a teleost.

mermaid's pinbox = mermaid's purse.

mermaid's purse = an egg-case of an Elasmobranchii, usually oblong with horns or tendrils.

mero- (prefix) = incomplete, part.

meroblastic = an egg of which only part undergoes cleavage - usually one with a large amount of yolk which is not incorporated into the developing egg, e.g. in Myxini, Elasmobranchii, Holocephali, many teleosts.

meroblastic cleavage = cell division in which sister cells are only partially separated from one another by cytokinesis. Also called incomplete cleavage.

meromictic = a permanently stratified lake, usually without oxygen (and fish) in its deeper portions, due to a density gradient and a lack of turnover.

meromixis = the process by which a lake becomes meromictic.

meropelagic = said of organisms that are only temporary members of the pelagic community.

meroplankton = planktonic eggs and larvae which are temporary members of the plankton, including many fishes.

merotype = a portion of the holotype that has been detached and is kept separate after the original publication. Probably more a botanical term but could apply to fishes where scales, pharyngeal teeth and other structures are removed for a later study.

mesal = mesell.

mesall = mesell.

mesalle = mesell.

mesell = infected, diseased or tainted fish. Also spelled mesal, mesall, messale, missael, mysel, myself, mysall and mysale.

mesencephalon = the midbrain, one of three regions that develop in the fish brain. Unlike the forebrain and the hindbrain, the mesencephalon remains undivided. Details of the brain structure of a fish (*Danio rerio*) may be found in Wullmann *et al.* (1996). See also brain.

mesendoderm = hypoblast (the inner of two layers of the blastoderm that forms during gastrulation and gives rise to the mesoderm and endoderm).

mesentery = double membranes meeting in the midline above and below the viscera formed by the serous membranes in the peritoneal and pericardial cavities. The mesentery in the pericardial cavity disappears during embryonic development and most the the ventral mesentery is lost in the peritoneal cavity except for falciform and gastrohepatic ligaments (q.v.).

mesethmoid = a term misapplied to the ethmoid (q.v.); the fish structure is not homologous with that in mammals.

mesh = 1) the opening in a net, bounded by the material from which the netting is made.

mesh = 2) to entangle in a net.

mesh = 3) to knit or make the sides, bottom and leader of a cod trap (Newfoundland).

mesh cut = t-cut (a cut in netting parallel to the general course of the netting).

mesh gauge = a device for measuring mesh size.

mesh herring = small herring up to about 6 inches or 15 cm long (Newfoundland).

mesh length = mesh opening.

mesh net = gill net.

mesh opening = the inside distance between two opposite knots (in knotted netting) or joints (in knotless netting) when fully extended.

mesh selection = fish above a certain size are unable to pass through a net of a certain mesh size while smaller fish can escape.

mesh side = the twine joining two knots and forming part of a mesh.

mesh size = the stretched length from corner to corner of the mesh of a net, i.e. the size of the holes, used to denote size of a net. Often regulated to allow young to escape.

mesh stick = a gauge used in making nets by hand.

meshed = a fish caught in the net's meshes.

meshing = when fish are caught in the net's meshes.

mesiad = toward or near the middle plane.

mesial = toward in the middle axis of the body.

mesionally = in or towards the middle.

meso- (prefix) = middle, intermediate.

meso-larva = a larval stage in which at least one, but not all, of the distinct principal rays of the median fin is apparent or, if the full complement is present and the adult possesses pelvic fins, the pelvic buds or fins are not yet apparent.

meso-tidal = a tidal range between 2 and 4 metres.

mesobenthos = organisms living on the sea bed between 200 and 1000 metres.

mesocoracoid = a paired pectoral girdle endochondral bone between the cleithrum dorsally and the coracoid and scapula ventrally.

mesocosm = in fish studies, a large aquarium which mimics environmental conditions, these conditions being capable of controlled change. Often culture systems for fish larvae but may also attempt to reproduce the environment of larger, adult fishes. May refer to enclosed natural bays, ponds, or large bags suspended in the environment.

mesohabitat = pools, runs, riffles or parts of lakes, *cf.* macrohabitat and microhabitat.

mesohaline = 1) pertaining to brackish water with a salinity between 3 and 10 parts per thousand or sea water between 30 and 34 parts per thousand.

mesohaline = 2) water with a salinity of 5.1-18.0 p.p.t. derived from ocean salts and pertaining to organisms able to live there.

mesolecithal = eggs with a medium amount of yolk.

mesomere = 1) a mesodermal component, a blastomere of intermediate size, larger than a micromere but smaller than a macromere.

mesomere = 2) the middle zone of the mesoderm of a chordate vertebrate embryo, from which excretory tissue develops.

mesomere = 3) a median series of bones supporting the pectoral fin in Sarcopterygii fish.

mesonephros = the functional organ of excretion with a large number of tubules in all adult fishes except Myxini. Arises in the middle portion of the body cavity but extends backwards to the entire length of body cavity, and is deflected ventrally on the posterior body wall to end on the posterior surface of the bladder. The mesonephros is a paired structure but may fuse posteriorly while separated anteriorly by the dorsal aorta. Anteriorly the mesonephros is expanded into a head kidney made up mainly of blood sinuses.

mesonost = the middle pterygiophore or radial, absent in many Teleostei.

mesopelagic = pertaining to the midwaters of the ocean between 200 and 1100 (or 100-1000m or 150-2000) metres (sources differ). Generally characterized by dim light and steep temperature gradients.

mesopelagic zone = the pelagic environment at depths listed above.

mesophytmile = pertaining to the floor of a lake between 6 and 25 metres.

mesoplankton = members of the plankton between 1 mm and 1 cm; not used much as it can be confused with plankton living at mid-depths.

mesopterygia = plural of mesopterygium.

mesopterygium (plural mesopterygia) = the median, elongated basal cartilage of the pectoral fins in Elasmobranchii, Holocephali and primitive Teleostomi.

mesopterygoid = metapterygoid (the deep, paired, endochondral bone forming the posterior end of the palatoquadrate and connected with the hyomandibula. Absent in many modern Teleostei. Also called endopterygoid and entopterygoid).

mesorchium = the mesentery suspending the testes.

mesosaline = 1) organisms capable of withstanding a medium range of salinity.

mesosaline = 2) water with a salinity of 5.1-18.0 p.p.t. derived from land-derived salts.

mesothelial = relating to the tissue lining body cavities.

mesotidal = a tidal range between 2 and 4 metres.

mesotrophic = adjective for mesotrophy.

mesotrophy = pertaining to waters having intermediate levels of primary productivity.

mesovarium = the mesentery suspending the ovaries.

Mesozoic = a geological era ca. 245-65 million years ago, comprising the Cretaceous, Jurassic and Triassic periods.

messenger = lazy deckie (a rope to haul the cod end to a ship's side).

met(t) = a measure, such as one or two bushels or a barrel, e.g. of herrings (British dialect).

meta- (prefix) = after, between, among, change, transformation, distal to, beyond, behind.

meta-larva = a larval phase in which the full complement of distinct principal rays in the median fish and pelvic fin buds or fins are apparent.

metabolic coefficient = the metabolic relationship between fishes under various conditions, usually between fish of different size, different species, at various activity levels, or under various environmental conditions.

metabolic rate = the amount of oxygen used per unit of body weight over a time unit.

metacentric = a chromosome having the centromere located at or near the middle.

metacleithra = plural of metacleithrum.

metacleithrum (plural metacleithra) = postcleithrum (plural postcleithra)(a dermal bone of the pectoral girdle posteroventral to the cleithrum which supports it dorsally. There may be one to several postcleithra (absent in some species). Also called postclavicle).

metahaline = waters containing between 36 and 40 parts per thousand of dissolved salts. See also euhaline and Venice system.

metal halide light = a white, hot, incandescent and fluorescent lighting for aquaria, particularly for reef tanks. It produces a wide spectrum of light and closely simulates natural light.

metalimnion = a zone of abrupt temperature change (thermocline) between the warm epilimnion and the cool hypolimnion of a lake.

metallotype = an unofficial term in nomenclature for an allotype (*q.v.*) of the opposite sex to that of the specimen designated or described in a publication subsequent to the original description. Not formal types.

metamere = a body segment.

metamerism = the segmental repetition of parts.

metamorphosis = a major structural change taking place during development from larvae to adult, e.g. Anguilliformes, Molidae.

metapleure = ventrolateral skin folds extending from the mouth to the atriore, where they join to form the caudal fold in Amphiox.

metapopulation = a set of partially isolated populations of the same species able to exchange individuals and recolonise sites where the species had become extirpated.

metapterygia = plural of metapterygium.

metapterygial whip = an elongate and thin extension of a fin based on the metapterygium.

metapterygium (plural metapterygia) = the posterior and innermost basal cartilage in the paired fins of Elasmobranchii and Holocephali. It is usually the longest basal and is exceptionally long in males where it is distally modified into a clasper, q.v.

metapterygoid = metapterygoid (the deep, paired, endochondral bone forming the posterior end of the palatoquadrate and connected with the hyomandibula. Absent in many modern Teleostei, it bears teeth in the Albulidae. Also called mesopterygoid, endopterygoid and entopterygoid).

metatopotype = a metatype, q.v., from the type locality.

metatype = 1) a specimen from the type locality determined by the original author subsequent to the original description of the species.

metatype = 2) a specimen subsequently determined by the author after comparison with type.

metaxymios = a rib-like bone (but not a rib) formed in the intermuscular septa. Dorsally called epineural bones, centrally epicentral bones and ventrally epipleural bones (more or less related to the vertical ribs). Also called intermuscular bones.

mete fish = freshly caught fish sold for immediate use rather than being salted or packed in barrels (Scottish dialect). Also spelled meit fish or meat fish.

metencephalon = the anterior part of the hindbrain. Gives rise to the fourth trochlear motor nucleus, the cerebellum dorsally and the interpeduncular nucleus ventrally. Details of the brain structure of a fish (*Danio rerio*) may be found in Wullmann *et al.* (1996). See also brain.

meteoric water = any water from atmospheric precipitation.

methaemoglobinaemia = the combination of haemoglobin and ammonium nitrate in fish blood causing brown blood disease or nitrite poisoning. Occurs under conditions of poor water. Nitrite oxidises the iron in fish haemoglobin to produce a molecule called methaemoglobin, which unlike haemoglobin, can't carry oxygen around the blood. This process causes extreme breathing difficulty or even suffocation. Nitrite also builds up in the blood causing poisoning, and may lead to liver, gill and blood cell damage.

method feeder = a central tube with three fins through which fishing line is threaded. A sticky form of ground bait, q.v., is moulded around the feeder and the hook with its bait is buried in

the ground bait. Fish coming to eat the ground bait will also eat the hook - this is so effective it has been banned at some British contests.

methylene blue = a dye (3,7-bis (Dimethylamino) phenazathionioum chloride) used against external bacteria and protozoans on fish.

methyostyly = a derivation of hyostylic jaw suspension in that the hyomandibula still plays a role in jaw suspension, but in this case the original elements have been replaced by dermal bone, and the hyomandibular is a reduced element at the jaw joint, e.g. in bony fishes.

metonym = a synonym.

metonymous homonyms = homonyms based on different nomenclatural types but which are considered to belong to a single taxon.

metre = 1.094 yd. Abbreviated as m.

-metric (suffix) = measure.

metric ton = tonne; 1000 kilograms, 0.984 long tons, 1.1023 short tons or 2204.6 pounds. Abbreviation MT, mt or t.

meunière = all kinds of fish can be cooked à la meunière. The fish is coated with seasoned flour, fried in butter and served with melted butter, lemon juice and herbs.

MEY = maximum economic yield (the total amount of profit that could be earned from a fishery if it were owned by an individual).

mezo = slang for a mesotrophic lake.

mho = abbreviation for conductivity, *q.v.*, measured in mhos (reciprocal ohms - mho is ohm backwards) (siemens is the metric version).

mi = mile (1.609 km, 0.870 INM).

micro- (prefix) = very small.

micro shot = very small split shot, *q.v.*, used with very sensitive pole float rigs. Sizes are from number 8 (small) to number 16 (minute). This shot enables the rig to sink slowly thereby catching any fish from the surface down to the bottom. Used particularly to catch small fish during matches.

micro-branchiospine = one of a series of small dermal ossifications, each bearing 5-20 tiny lateral spines, located on the outer face of each gill arch except the first near the base of the gill filaments as in *Tilapia* (Cichlidae). They may sieve out phytoplankton or protect the gills from abrasion by fine particles. Micro-branchiospine-like structures are found in Centropomidae, Pomadasytidae and Gerreidae due to homoplasy.

micro-climate = the climate of a small, specific place within an area as contrasted with the climate of the entire area. Often inhabited by a unique assemblage of species.

micro-encapsulated diet = feeding small, particulate formulated feed in aquaculture to fish larvae. The feed is enclosed in a capsule of different material (a membrane or binder) from the contained feed.

micro-gill raker = micro-branchiospine.

micro-tidal = a tidal range less than 2 metres.

microbarb= a very small barb on a hook in designed to lessen damage to fish and to small baits such as maggots.

microbound feed = a particulate, formulated feed in aquaculture for fish larvae. The particles are 50-700  $\mu\text{m}$  and are held together by an internal binder made of complex carbohydrate or protein with a adhesive and absorptive properties.

microcard = a copy of a publication on a small card requiring a microscope or special reader to read because much reduced in size.

microconstituent = the elemental makeup of bones. These can be used in fishes to determine life history, e.g. deposition of elements in fresh water is different from that in the sea.

microencapsulated feed = small, particulate formulated feed in aquaculture for fish larvae. The feed is enclosed in a capsule of different material (a membrane or binder) from the contained feed.

microfiche = a copy of a publication on a small transparent piece of photographic film requiring a microscope or special reader to read because much reduced in size.

microfilm = a copy of a publication on a continuous roll of transparent photographic film requiring a microscope or special reader to read because much reduced in size.

microgamete = the male gamete, smaller than the female gamete.

microhabitat = 1) an area somewhat larger than the fish itself, *cf.* mesohabitat and macrohabitat.

microhabitat = 2) a portion of a larger habitat. Selected by a fish for specific purposes and separated from adjoining microhabitats by physical characteristics such as depth, cover, velocity, etc.

microincrement = growth increments less than 50  $\mu\text{m}$  in otoliths or other structures used in ageing, only observable with a microscope and used to describe daily or shorter increments.

microincrement scale = a scale present from the early life history of a fish which has not been resorbed.

micromelanophore = a minute type of melanophore about 1/3 or less the diameter of a normal-sized melanophore (or macromelanophore). May be inherited independently from macromelanophores.

microparticulate diet = very small food particles manufactured for larval fish in aquaculture.

microphagous = adjective for microphagy.

microphagy = eating small particles or organisms such as plankters.

microphytrophagy = feeding on phytoplankton. Also called phytoplanktrophagy.

microplankton = members of the plankton less than 1 mm long.

micropredator = eating very small prey.

micropyle = the minute aperture in the egg membrane for the entry of the sperm.

microsatellite = a very short unit sequence of DNA (2 to 4 base pairs) that is repeated multiple times in tandem. Microsatellites are highly polymorphic and make ideal markers for analysis of relationships.

microsmatic = forms with poorly developed olfactory sense, e.g. *Esox*, *Exocoetidae*, *Gasterosteidae*. Opposite of macrosmatic, *q.v.*

microsporidial infection = infection of fish with any sporozoan member of the Protozoa considered to be a microsporidian.

microsquamose = having very small scales, e.g. in the extinct thelodonts, presumably jawless vertebrates known mostly from their minute scales.

microstructural growth interruption = deposition of organic material interrupting growth of crystallite in an otolith.

microtag = a coded tag of very small size capable of being inserted into a fish to track that individual as well as attached externally.

microtidal = a tidal range less than 2 metres.

microworm = a food for aquarium fry and smaller fish species. Microworms, *Anguillula silesiae*, are a type of nematode usually found in decomposing fruits and are about 1-3 mm in length. They can be cultured in trays of wet oat meal kept at a temperature of around 25°C in a dark location. Yeast may be added to encourage fermentation.

mid-brain = the area of the larval fish brain that includes the optic and cerebellar lobes. Also called mesencephalon.

mid-caudal length = fork length (the distance from the most anterior point of the body to the deepest point of the fork in the caudal fin. Abbreviated FL. Mostly used in fishery biology and not in systematics).

mid-dorsal streak = a pigmented line running along the middle of the back.

mid-extreme tide = a plane midway between the extreme high water and the extreme low water occurring in any locality.

midden = a rubbish heap of domestic waste, including fish bones which enable past diets to be determined.

midden rigs = the backbones of fish used as manure (Scottish dialect).

middle = a large piece of dried salted cod obtained after the nape, tail and thin part of the belly have been removed. Also called steak.

middle course = the stretch of a river between the upper and lower parts, below the trout zone and above the bream zone (both *q.v.*).

middle distance = the fishery or the vessels engaged in the fishery, between the local inshore and the distant offshore sectors (Newfoundland).

middle reach = middle course.

middle twine = lint (netting in the main body of a drift or gill net. Also called body, middle yarn, netting, sheet, webbing, yarn).

middle water trawler = a trawler taking trips of about 14 days.

middle yarn = lint (netting in the main body of a drift or gill net. Also called body, middle twine, netting, sheet, webbing, yarn).

middle-level consumer = second-level consumer (a fish that feeds on other animals that themselves feed on plants).

middleground shoal = a shoal formed by ebb and flood tides in the middle of a channel of the lagoon or estuary end of an inlet.

middleman = a fisherman and owner of fishing premises and vessel who is supplied by a merchant and engages a crew on the share system (Newfoundland).

midlake = in the middle part of a lake.

midline = the line of the median plane of the body.

midshipman = a fisherman occupying the midship position in an undecked boat (Newfoundland).

midshore = 1) relating to the middle distance fishery.

midshore = 2) the area of the shore between the upper and lower shores.

midstream = in the middle part of a stream.

midwater = pertaining to the mesopelagic zone; any part of the water column between the surface and the bottom.

midwater drift = operation of gillnets between the bottom and the surface of a water body.

midwater otter trawl = midwater trawl.

midwater trawl = a net towed through the water column by one boat, the net being positioned above the bottom and below the surface. It may have otter doors that function to keep the net mouth open and depressor plates that function to make it fish deeper, or two vessels pair trawling keep the mouth open. The front net sections are often made with very large meshes or ropes, which herd the fish schools towards the net aft sections. The fishing depth is usually controlled by means of a net sounder (netsonde). Also called midwater otter trawl.

midwater pair trawl = a net towed through the water column by two boats, thus ensuring the horizontal opening of the net. Such nets are designed and rigged to work in midwater. Surface trawls are also included in this category.

miette = a small piece of tuna meat obtained when the cooked fish is cut into slices. This term is only permitted for tuna products (France).

migaki-nishin = herring pan-dressed and cut into fillets, then dried in the sun without salting (Japan).

migraine = easily cured by tapping the head with a fish according to ancient Egyptian physicians.

migration = 1) a directed (not aimless) journey and return occurring regularly in a species, usually at a definite stage in the life cycle, e.g. anadromous, catadromous, diadromous, amphidromous, potamodromous, oceanodromous, all *q.v.*

migration = 2) movement of a pathogen in a host body.

migration = 3) gene flow.

migration = 4) in flatfishes, the movement of one eye to the other side of the head involving crossing of the optic nerves in the optic chiasma.

migratory fish = fish having the habit of migration.

migratory fisherman = a fisherman who travels to offshore or distant waters to catch fish.

*mihi* = belonging to me, to me, of me (as of authorship of a new species, or used to show the writer's responsibility for a statement or proposal).

mild cured fish = smoked or salted lightly with resulting limited shelf life.

mild smoked fish = fish smoke-cured for a short period to give a slightly smoky flavour; has limited keeping quality. Also called light smoked.

mile = 1.6094 km, 0.870 INM. Abbreviated as mi.

milk = 1) to play a fish too long.

milk = 2) milt (archaic). Also spelled mylk.

milk bush = *Euphorbia tirucalli*, a thorny Indian bush, often used as hedges, which has an acrid milky sap used in poisoning fish.

milk soup = a soup made of milk, bread or rice, or with flaked white fish and milk. Can include chopped hard-boiled eggs and parsley.

milker herring = Dutch cured herring with the gonads left in the fish. Usually packed in small barrels with about 12 fish for the North American delicatessen trade. Also called melker or Norwegian milker.

millessness = murky or liquefied flesh in such species as hake, halibut and wild and farmed salmonids. Myxosporeans (*Kudoa* spp.) secrete a proteolytic enzyme causing unsightly white cysts in the flesh and, in extreme cases, softening and liquefaction. Cysts become evident if the fish is smoked.

mill = a circularly swimming mass of fishes, usually formed only by obligate schoolers.

mill dam = a dam across a river used to back up water and make it available for a mill.

mill pond = the pond formed by damming a stream to create a head of water to run a mill.

mill race = the channel or current of water used to drive a mill wheel.

milt = 1) the seminal fluid; male gonads (testes). Marketed fresh or canned, particularly from herring and mackerel and called soft roe. When released into the water often creating a cloudy effect, either over a small area or in massive spawnings visible from the air.

milt = 2) to impregnate with milt.

milt roe = sperm or milt of a male fish.

milt sauce = milt of herring mixed with vinegar sauce and strained to remove membranes. Used for packing vinegar cured herring products.

milter = a male fish ready to breed.

mimetic = pertaining to or exhibiting mimicry.

mimicry = similarity of appearance between two species, the mimic gaining protection from resembling a dangerous organism such as a predator or poisonous organism (Batesian mimicry) or where both species are protected against predators by being distasteful and they gain mutually since predators avoid both species by tasting one (Müllerian mimicry).

mimotype = one of two or more similar morphs of taxon occurring in different areas (not a nomenclatural term).

*min. parte* = abbreviation for *pro minore parte*, meaning for the smaller part. May be used to indicate that a scientific name has been used in a particular sense.

Minamata disease = mercury poisoning of humans from eating contaminated seafood such as fish.

minced fish = the flesh of a fish separated from skin and bones by mechanical means (see bone separator). Also called mechanically recovered fish flesh, recovered flesh, recovered fish flesh, boneless fish meat and deboned fish.

mini-atoll = a ring-shaped patch reef with a lagoon or central area of sand.

minimum biological acceptable level = 1) a value of spawning stock biomass below which the probability of reduced recruitment increases as spawning stock size decreases.

minimum biological acceptable level = 2) legislated size below which individuals of some fish species, if caught, are not to be retained.

minimum edition = the recommended minimum number of printed items before distribution (25 has been suggested). This allows for a taxonomic work (with new names, for example) to be distributed in sufficient numbers to be available for examination and to ensure against loss.

minimum landing size = the smallest length at which it is legal to keep or sell a fish. May not be the biologically optimum size but a market size.

minimum legal size = a regulation where captured fish smaller than a set size must be returned to the water.

minimum lethal dose = the smallest amount of a lethal compound sufficient to kill all of the test animals.

minimum mesh size = the smallest legal mesh size used for a given type of net (measured across the diagonal under tension).

minimum pool = the lowest level of a reservoir safe for maintaining fish.

minimum protein level = the level of protein in a fish diet ensuring adequate growth and lowest cost commercial production.

minimum size = regulations as to catches of fish by forbidding takes below a minimum size.

minimum stock size threshold = the minimum size of the stock that is required to produce maximum sustainable yield, below which the stock would be considered overfished. Abbreviated as  $B_{\text{threshold}}$ .

miniaturization = the evolution of small size, e.g. in various cyprinid and gobiid fishes. *Paedocypris progenetica*, a cyprinid, is arguably the smallest fish and vertebrate at 7.9 mm standard length and *Schindleria brevipinguis*, a gobiid, has males mature at only 7 mm.

Minister's dog = a Tweed River, Scotland, salmon fly made originally from the yellow hairs of a dog belonging to the minister of Sprouston in 1915.

minni = minnie.

minnie = a stone on the end of a rope plunged repeatedly into the mouth of a pilchard seine net to prevent fish from escaping (Cornish dialect).

minnow = 1) a member of the family Cyprinidae or of some Cyprinodontidae.

minnow = 2) any small or young fish.

minnow = 3) any small non-game fish.

minnow = 4) the cyprinid *Phoxinus phoxinus*.

minnow = 4) anything small or insignificant.

minnow = 5) the underdog in a sporting contest.

minnow = 6) in angling, a long thin plug or a shallow diving plug retrieved by a series of fast pulls and jerks.

Minnow = 7) the S.S. Minnow was the stranded boat in the television show "Gilligan's Island".

minnow bucket = a metal, plastic or styrofoam bucket with a lid used to transport bait fish alive for angling.

minnow can = a holding device for minnows.

minnow crate = minnow can (obsolete).

minnow fisher = 1) an angler who uses minnows as bait.

minnow fisher = 2) a person who fishes for minnows.

minnow propagation = culturing bait fish for profit or for sport.

minnow tansy = a meal of minnows seasoned with tansy.

minnow trap = a simple trap of metal or plastic in two equal halves, joined at the middle with a catch. The trap can be sunk in water of any depth and marked by an attached line and float. It has an inward-directed, narrowing cone that fish can enter but find difficult to locate and leave through. The trap can be baited and is used for catching small fishes used in bait fishing and in scientific surveys of smaller species. Glass minnow trap jars are also made and sold.

minnow twisting = an erratic movement reminiscent of that of a minnow.

minnow zone = grayling zone (an area of a river lying between the trout and the barbel zones (both *q.v.*) characterised by alternating rapid and moderate currents).

minnow-saver = a chemical additive for tap water to remove chlorine and copper and keep bait fish alive longer in a minnow bucket.

minnow-sized = a small fish.

minor carp = smaller carp species (Cyprinidae) as opposed to the Chinese and Indian major carps, *q.v.*

Miocene = a geological epoch within the Tertiary ca. 26·5 million years ago.

miracle = phosphorescence on raw fish (Scottish dialect).

miragotype = a joke term in nomenclature for a type where key characters are only visible under particular conditions.

mire = collective noun for bogs and fens.

mirin-boshi = split fish usually without the head, dried after soaking in seasonings consisting of either soy sauce, sugar and sweet rice liquor (mirin), or salt, sugar and gelatine or agar (Japan).

misapplication = the use of a scientific name for a taxon which does not include the type within its range of variation; to apply, deliberately or otherwise, a name in a sense which is not correct under the provisions of the International Code of Zoological Nomenclature, e.g. in a manner not in accord with the name-bearing type.

misapplied name = a name given to a taxon which excludes the nomenclatural type of the name.

misapply = the verb for misapplication.

miscellaneous species = fish species not subject to quota management.

misidentification = the incorrect assignment of a specimen to a taxon; the incorrect identification of a species.

misidentify = the verb for a misidentification.

misplaced term = a rank-denoting term used in the wrong place to that specified in the Code of Zoological Nomenclature, e.g. an order within a family.

misquotation = an error in citing a text or a paper.

misreporting = inaccurate catch recording in log books or other official reporting systems by under-reporting the catch or misrepresenting the area fished.

Miss Katie = a fishwife who sold dried fish at fairs and markets (Scottish dialect).

missael = mesell.

mite = fish mite (a parasite infesting salt fish).

mith = meese.

mitigation = replacing a lost fish resource with an acceptable alternative.

mitochondrial DNA (mt DNA) = a form of DNA, the chemical basis of heredity, found in the mitochondria (or energy producing structures within cells) and used to identify and relate fish species.

mitogenome = the complete mitochondrial genome.

mittes = small pieces of tuna obtained from cooked fish when sliced.

mixed culture = aquaculture involving raising fish of different species or ages in the same water body.

mixed farming = mixed culture.

mixed fertiliser = having more than one of three major nutrients, nitrogen, phosphorus and potassium.

mixed fishery = a fishery catching several species, often a demersal fishery.

mixed layer = a layer of well-mixed water through wave action or convection.

mixed stock = a stock composed of native and non-native parents or a native stock that has undergone substantial genetic alteration.

mixed stock exception = where many species of fish occur together, some may be overfished while others are being harvested in a sustainable fashion. If these mixed stocks were managed on the basis of the overfished stock then no fishery could occur - an exception is made and some overfished stocks are allowed to be caught.

mixed stock fishery = a fishery catching fish from more than one stock.

mixed tide = a type of tide intermediate to those predominantly semidiurnal and diurnal.

mixing rate = the speed at which water masses in a reservoir are mixed during seasonal circulation (turnover).

mixipterygium = myxopterygium.

mixoeuhaline = pertaining to estuarine waters containing more than 30 p.p.t. of dissolved salts but less than the concentration of the open sea.

mixohaline = brackish water, water of intermediate salinity, 0.5-30.0 p.p.t. from ocean-derived salts.

mixolimnion = the uppermost region in a meromictic lake with free circulation and capable of supporting fish.

mixomesohaline = said of brackish water containing from 5 to 18 p.p.t. dissolved salts.

mixooligohaline = said of brackish waters containing from 0.5 to 5 p.p.t. dissolved salts.

mixopolyhaline = said of brackish water containing from 18 to 30 p.p.t. dissolved salts.

mixopterygium = myxopterygium.

mixosaline = brackish water, water of intermediate salinity, 0.5-30.0 p.p.t. from land-derived salts.

mm = abbreviation for millimetre.

mm. = abbreviation for muscles.

moak = moke.

mobile = fish which normally range widely, e.g. beyond 1.6 km of the point of release. Opposite of sedentary, q.v.

mobile fishing gear = 1) any towable gear such as trawls.

mobile fishing gear = 2) any gear that can be moved from place to place, even gear that is fixed when operational.

mobile impoundung net = a net not attached to the bottom, easily moved around, only fishes when moved through the water.

mobilitotype = a joke name in nomenclature for a type represented only by the banding pattern on a particular gel.

mode = the value which occurs at the highest frequency, e.g. fin ray counts often have strong modes, characteristic of a species.

model = a simplified concept of how nature really works.

model perfect hook = a round bend all-purpose hook with a wide gape.

modified release = a marine fishing tournament in which only fish below a certain size are released.

moggi(e) = the stomach of a fish or whale (Shetland Isles dialect). See also cropping moggies.

mohan = a northern Indian word for a variety of fish poisons including cactus sap (*Euphorbia rogleana*), crushed seeds of *Cascaria tormentosa* and *Xanthoxylum alatum* (toothache tree, Rutaceae), and boiled tea leaves mixed with lime.

mohua = a fish poison, the alkaloid saponin, from the powdered seeds of *Bassica latifolia* (India).

moist pellet = a pellet used in aquaculture with a moisture content around 30%. Composed of wet ingredients such items as minced fish, and dry ingredients such as fish meal, cereals, vitamins and minerals, with an alginate binder. Also called Oregon moist pellet.

moist pellet ration = a diet based on moist pellets.

mojama = strips of salted, dried tuna (Spain).

mojo rig = a rig similar to a Carolina rig except fished on a spinning rod and so is a finesse (q.v.) method. The sinkers are cylindrical or pencil-shaped so that they do not snag on rocks.

moke = the mesh of a net (English dialect). See also moak and mox.

molar = a large flat or ridged-topped tooth adapted for crushing or grinding, e. g. in Anarhichadidae.

molariform = shaped like a molar in mammals, being rounded and flattened. Molariform teeth are used for crushing molluscs and crustaceans.

mole = a very large solid-filled structure protecting or forming a harbour. May provide a habitat for fish species. Also called jetty.

molecular adsorption pad = a polyester pad which has been chemically treated to absorb certain substances from the water in aquaria. The pad is contained in a canister or power filter. May remove good trace elements as well as pollutants.

molecular systematics = the study of molecular biological diversity within and between taxa.

molesting = any interference with fish other than legal means of capture. Includes injury inflicted on fish meant to be released.

molick = a length of fishing line (40-50 fathoms) (Scottish dialect).

molik = molick.

mollag = a dog's skin blown up as a bladder and used as a buoy to float herring-nets (British dialect).

molluscivore = eating molluscs, snails, clams, etc.

moluha = fermented fish product (Egypt).

monacmic = referring to an annual period of change in an aquatic population.

monandric = the adjective for monandry.

monandry = protogynous hermaphrodites among which all males are sex-reversed females. See also diandry.

Monday's haddie = a stale fish, one that was caught two days ago, since there is no fishing on Sunday (Scottish dialect).

money = fish have been used as money in various countries, e.g. in 1640 dried fish were acceptable as payment of taxes in parts of New England; dried cod were used in nineteenth century Newfoundland.

mongrel combination = a word composed of parts of two languages, e.g. in scientific names.

moniliform = resembling a string of pearls, said of the notochord in Teleostei where it is alternatively thread-like and expanded in cavities.

monimolimnion = the lower, perennially stagnant region in a meromictic lake; fishless.

monitoring, control and surveillance = activities by the fisheries enforcement system to ensure compliance with fishery regulations.

monk = a weir structure used to regulate water depth in a pond with a screen to retain fish.

monkey climber = a bite indicator used for legering; a bobbin slides up and down a metal spike to indicate bites.

monkeyfishing = using a home-made device to send a strong electrical current through the water, stunning fish which float to the surface and can be dip-netted. Illegal. Also called telephoning.

mono = monofilament.

mono leader = a leader made of monofilament, much heavier and stronger than the line of the reel.

mono- (prefix) = one, single.

monobasic = used of a genus established on, or comprising, a single species.

monoculture = culturing a single species in aquaculture.

monocyclic fish = those fish which spawn once in the last stage of life (as opposed to polycyclic fish, *q.v.*), e.g. *Oncorhynchus*, *Anguilla*.

monodelphous homonyms = devalidated names (*q.v.*) taken up by different post-starting point authors independently but validated with different nomenclatural types.

monoecius = containing ovarian and testicular tissue in one individual, e.g. some Sparidae and Serranidae.

monofilament = a single, untwisted synthetic line used in fishing. Usually nylon but may now be perlon or teflon.

monogamy = a male and a female mating only with each other.

monogenetic = a suprageneric taxon having only one genus.

monogenotype = 1) the single species included in a monotypical genus at the time of publication. See also tautogenotype.

monogenotype = 2) an unofficial term in nomenclature for a type by original fixation.

monograph = a comprehensive published work on a single topic or taxon.

monomictic = said of a lake having a single period of free circulation or overturn per year (usually in the fall).

monomorphic = a population or a taxon showing no genetically fixed discontinuous variation.

monomial = uninomial or correctly uninomen (plural uninomina) (a scientific name consisting of a single word, used for higher taxa above the rank of species group).

mononym = uninomen (plural uninomina) (a scientific name consisting of a single word, used for higher taxa above the rank of species group).

monophagous = adjective for monophagy.

monophagy = feeding on a single type of food.

monophyletic = having a single unbranching line of evolution. A monophyletic taxon includes all descendants from the common ancestor of its members. A "monophyletic group" usually refers to a clade, i.e. an organism and all of its descendants.

monosex culture = the use of a single sex in fish culture to prevent uncontrolled reproduction and to reduce size variability in the product.

monospecific = said of a genus containing only one species.

monospecies culture = culturing a single species in aquaculture.

monospondylous = vertebrae with only one centrum, the typical vertebrae in Chondrichthyes and Actinopterygii.

monotaxic = referring to two or more taxa, belonging to the same taxon.

monotermous = having a single nostril opening (ditermous is two openings).

monothetic key = a dichotomous key in which each couplet has single contrasting statements requiring simple either/or answers.

monotype = a monotypic taxonomic unit, not a name for a type but has been used for an implied holotype.

monotypic = a taxonomic unit including only one lower unit, e.g. a monotypic genus includes only one species.

monotypy = the situation arising when a genus-group taxon is established with only one originally included species. If no nominal species were included at the time a genus was established before 1931 and subsequently a single nominal species is first referred to the genus, then that species is *ipso facto* the type-species, by subsequent monotypy.

monstrositas = monster; huge; outrageous. Used to indicate an unusual form such as a deformity but also a form different from normal, e.g. a mirror carp with isolated large scales.

monstrosity = monstrositas.

montane = mountainous; a stream characterised by a high gradient, riffles composing more than half the length and pools frequently run-like.

moochim = a Korean-style dried fish with soy sauce.

mooching = slowly raising and lowering a baited hook while drifting in a boat, e.g. for salmon.

moon light money = a due paid by fishermen for the right to fish for herring during the second or third quarters of the moon (Scottish dialect).

moon pool = an opening in the bottom of a ship allowing sampling without exposure to the weather conditions found on deck.

mop = an artificial, aquarium spawning medium for those fishes that deposit or scatter adhesive eggs in or over vegetation; consists of a mass of synthetic yarn tied into various configurations. See also floating (or top) mop, bottom mop and trailing mop.

moratorium = a temporary prohibition or suspension of fishing.

Moray flee = a Scottish artificial fly made of yellow chamois.

morbidity = 1) the condition of being diseased.

morbidity = 2) the proportion of diseased fish in a population or a sample over a given time.

morbidity rate = morbidity (2).

more fish in the sea = a proverb meaning do not be concerned about what you have lost. Often refers to lost love.

more than one way to skin a cat = usually applied to felines but in the southern United States where eating catfish (Ictaluridae) is common, applied to a fish and also meaning there is more than one way to do something.

moribund = nearly dead.

morkin = decayed or rotten meat or fish (Scottish dialect).

mormyromast = one of an innervated group of cells in a round capsule at the end of a jelly-filled tube opening to the skin surface of Gymnarchidae and Mormyridae; electric sense organs. Also called snout organs or multicellular glands.

moratorium = a mandatory closure of a fishery in an area with a particular gear for a specified period of time. May apply only to new fishers or be an outright ban.

mormyrocerebellum = the greatly enlarged lobi laterales valvulae of the cerebellum which displace the optic lobes laterally and ventrally and cover the brain dorsally and laterally in the Mormyriformes. Also called gigantocerebellum.

mormyshka = a Russian lure, originally big spoons used for ice jigging, eventually becoming a metal head of varying shape (often globose) with a hook attached. The line is passed through a hole in the head and whipped to the hook. As a result the hook is horizontal in the water with the point above the shank. Popular in Russia and Scandinavia (ice fishing countries). Now used too in summer fishing and with a baited hook. The name is from the Russian for scud (the freshwater gammarid amphipod).

morph = literally a shape, but meant as a form or variant of a specimen or stage in a life cycle with a particular appearance. Not of systematic or taxonomic significance.

-morph (suffix) = form, shape.

morpha (plural morphae) = a morph; not of systematic or taxonomic significance.

morphae = plural of morpha.

morphoedaphic index = an index of potential fish production in lakes. Calculated by total dissolved solids (mg/l)/mean depth in metres. Abbreviated as MEI.

morphology = the appearance, form and structure of an organism, especially based on external characters.

morphometric character = a character based on measurement. In fish, measurements are taken on a straight line basis, not around the curve of the body with the exception of such measurements specifically intended to measure roundness, e.g. girth. Any measurement should be defined or referenced to a standard work as some may include soft parts or only be from bony margin to bony margin. Note that North American students of fishes mostly use straight-line measures between fixed points on the body, e.g. predorsal distance is from the anterior base of the dorsal fin to the tip of the snout while older European literature and some modern works use measures between verticals, e.g. predorsal distance is from a point on the flank directly below the dorsal fin origin in the mid-line of the fish. The latter methodology means that the sum of snout length, eye diameter and postorbital length equals head length, while the former methodology would not (e.g. postorbital length would be the longest distance from the orbit to the margin of the operculum and this is often at an angle, not on a mid-line). Some measurements include:-

- 1) Total length - from the anteriormost part of the head to the tip of either lobe of the caudal fin when that fin is normally splayed.
- 2) Standard length - from the anteriormost part of the snout (even when the lower jaw projects) to the end of the hypural plate (the end of the plate is found by flexing the caudal fin; in small fish it may be seen by shining a strong light through the caudal region). Standard length can be an inaccurate measurement. The end of the hypural plate is obscured by scales, flesh and caudal rays. Its position is determined by flexing the caudal fin; this flexure is taken to be the end of the hypural plate. Small fish have thin, delicate bones and the flexure may be at the anterior base of the hypural plate, at the origin of the caudal fin rays which articulate with and overlap the end of the hypural plate, or even between the last whole vertebra and the hypural plate. Large fish have a broad flexure which can give a variety of measurements by independent observers. If fish are comparatively small then strong illumination helps to discern the end of the hypural plate, in large fish this is somewhat inaccurate.
- 3) Head length - from the anteriormost part of the snout to the bony margin of the opercle (excluding the opercular membrane).
- 4) Body depth - maximum straight line depth excluding fins or fleshy and scaly structures at fin bases.
- 5) Body width - maximum distance from one side of the body to the other.
- 6) Head depth - from the occiput vertically to the breast or lower head surface.
- 7) Head width - the distance between the opercles when in their normal, closed position. The opercles are gently pressed into a closed position if greatly dilated.
- 8) Snout length - from the anteriormost part of the snout or upper lip at the mid-line to the bony front margin of the orbit.
- 9) Orbit diameter - greatest diameter between the bony rims of the orbit. This distance is not always horizontal.

10) Postorbital length - greatest distance between the posterior bony orbit margin and the bony opercular margin.

11) Interorbital width - least bony width between the orbits over the top of the head in a straight line.

12) Predorsal length - from the base of the anteriormost dorsal fin ray to the tip of the snout or upper lip.

13) Prepelvic length - from the base of the anteriormost pelvic fin ray to the anteriormost point on the head (snout or upper lip).

14) Preanal length - from the base of the anteriormost anal fin ray to the anteriormost point on the head (snout or upper lip).

15) Length of caudal peduncle - the oblique distance from the insertion of the anal fin to the mid-point of the end of the hypural plate.

16) Depth of caudal peduncle - the least depth of this structure from the mid-line of the ventral surface.

17) Length of the longest dorsal and anal fin rays - from the structural base of the ray to its tip.

18) Length of the dorsal and anal fin bases - from the anteriormost ray base (the origin of the fin) to the point where the fin membrane contacts the body behind the last ray (the insertion of the fin).

19) Length of the pectoral and pelvic fins - from the extreme base of the uppermost, outermost or anteriormost ray to the tip of the fin.

20) Distance between pectoral and pelvic fin bases - used principally in Cyprinidae and Cobitidae, this and the following measurement are from the extreme base of the anteriormost, uppermost or outermost ray of the appropriate fin to the anterior base of the next fin.

21) Distance between the pelvic and anal fin bases - as above.

22) Length of fin spine - from the base of the spine to its tip. In pungent spines, as in catfishes, this excludes soft rays or membranes distal to the sharp tip, but in more flexible spines, which may taper gradually as in Cyprinidae, this measurement includes the soft tip.

mortality = the death of fish; a measure of the rate of death of fish due to such factors as pollution, sickness and starvation but mainly predation (in unexploited stocks) and fishing (in exploited ones).

mortality rate = the rate at which the numbers in a population decrease with time due to various causes. The proportion of the total stock (in numbers) dying each year is the annual mortality rate. To facilitate calculations, mortality is expressed as an exponential rate (called instantaneous rate) thus  $Nt/N_0 = e^{-Z} = e^{-(M+F)}$  in which  $Nt/N_0$  is the survival rate, M the

natural mortality rate, F the fishing mortality rate, and Z the total mortality rate (of deaths due to predation or disease).

morphometric character = a measurement of a body part, e.g. head length.

mophon = an unofficial term in nomenclature for a definitely formed individual.

morphonym = an unofficial term in nomenclature for the name of a species; the specific name.

morphotype = 1) one of several morphologically distinguishable populations of a single taxon. Usually these are of no taxonomic significance or any such significance has not been determined.

morphotype = 2) a figured specimen which has not been used to illustrate anything not previously known about the morphology of the taxon.

morphotype = 3) the type specimen of a different morph of a dimorphic or polymorphic species.

morphotype = 4) an archetype (the generalised or idealised pattern shared by all members of a taxon (obsolete and not an official term in nomenclature)).

mort = a young salmon, variously given as in its first or third year, or referring to any young salmonid (British dialect).

mortality = 1) the number of fish lost through fishing and natural causes.

mortality = 2) the ratio of dead to living fish in a population.

mortality pit = an excavation use for the disposal of large numbers of fish specimens contaminated with toxic substances, drugs or diseases and parasites. Hydrated lime can be added to raise the pH to lethal levels, destroying pathogens. The pit may be lined if the fish contain contaminants that would pollute the ground water.

mortality rate = 1) in fisheries the rate at which fish die from fishing and natural causes. Instantaneous rates with short time intervals are used to allow separation of the primary components as instantaneous fishing mortality (F) and instantaneous natural mortality (M). These two equal instantaneous total mortality (Z).

mortality rate = 2) the number of deaths per unit of population over a specified period.

morts: = of mortalities; a term used for deaths in a fish farm.

morula = a stage in egg development where the blastomere forms a mulberry-like cluster,

mosaic = an organism comprising tissues of two or more genetic types.

mosaic teeth = the series of rows of flat teeth found in rays and skates, and some sharks, used for crushing such hard foods as molluscs and crustaceans. Also called pavement teeth.

mosquitofish = *Gambusia* spp. (Poeciliidae) used as a malaria control agent and widely introduced across the world. These fishes eat the aquatic larvae and pupae of malarial mosquitos.

moss = swamp (Saxon, but still in use in England as a descriptor of an area).

mossback = slang for any old and large fish.

mother fish = a large cod-fish of breeding age (Newfoundland).

mother ship = a large vessel servicing fishing vessels and on which fishing vessels load their catches for processing and transport to port.

motile aeromonad septicaemia = bacterial haemorrhagic septicaemia (a bacterial infection with *Aeromonas liquefaciens*, *Aeromonas hydrophila* or *Pseudomonas* affecting fishes of all ages, usually in spring. Usually associated with stress and overcrowding. Haemorrhages occur in the skin, fins, mouth cavity and muscles. Exophthalmia and cavity ulcers may occur. Also called infectious dropsy, red pest, freshwater eel disease, pike pest, and redmouth disease.

motor fishing = maintaining station over a fishing spot using the boat's motor. Used in deep water where it is impractical to anchor and/or too time-consuming.

mottled = colouration composed of pigmentation that runs together; blotched; small dark and light areas interspersed.

motu = a coral island in the lagoon of an atoll.

mount = a taxidermy specimen. Some old type specimens of fishes are mounts.

mousie = 1) a small white worm or grub used as bait in ice fishing. Usually the rat-tailed maggot of the hoverfly, cultured as bait. The rat-tail is a telescopic siphon used as a snorkel for breathing while submerged.

mousie = 2) a small jig used in ice fishing.

mouth = 1) the structure through which food and water for respiration enter the fish body.

mouth = 2) the opening of a net through which fish enter.

mouth = 3) the outfall of a river.

mouth brooder = oral brooder (a fish which broods or protects the eggs (ovophile) or young (larvophile) by taking them into the mouth). This reproductive guild (q.v.) includes those fish that mouth brood without buccal feeding and those that buccal feed the embryos. The former incubate eggs in the buccal cavity of the male, the female or both sexes, the eggs are large, spherical or oval, with dense yolk, are churned in the cavity or are densely packed with well-developed respiratory plexuses aided by endogenous oxidative metabolism of carotenoids, embryos do not feed externally in the buccal cavity, and large young are released, e.g. *Apogon imberbis*, *Oreochromis mossambicus*. The latter have fewer and larger eggs and early hatching

embryos with a large yolk which feed on particles inhaled by the female, e.g. *Arius falcarius*, *Cyphotilapia frontosa*.

mouth fungus = a bacterial infection (*Flexibacter columnaris* or *Flavobacterium columnare*)(not a fungus) causing a cotton wool-like growth usually in the mouth region. A rapid infection, often fatal, first seen as light grey marks. Usually occurs in aquaria with pH over 6, higher temperatures and hard water and to fish that are already injured. Proprietary treatments are effective and the antibiotic oxytetracycline can be used for valuable fish. Called columnaris disease when found on other parts of the body. Usually occurs in summer in natural waters and is associated with stress, crowding, injury and poor water quality. Virulent forms may show no external symptoms, less virulent forms show grey-white lesions on the body, fins and gills. Lesions first appear on the caudal fin and progress towards the head. Heavy infections appear yellow or orange. Scaleless fish show lesions comprising a dark blue area overlain by a milky veil and with a red-tinged margin. See also saddleback, saddlepatch disease and mouth rot, depending on locality on body.

mouth rot = mouth fungus.

moveable ethmoid = kinethmoid (a small median bone in the snout dorsoposterior to the premaxillaries in cyprinoids (between the nostrils). Replaces rostral bone, now restricted to primitive bony fishes. Aids in protrusion of the premaxillaries).

mox = moke.

MS (plural MSS) = manuscript (a text, either handwritten or typed, but not available in multiple copies. Used for the copy of a scientific paper submitted to a journal for publication).

MS-222 = a fish anaesthetic applied by immersion in dosed water (tricaine methanesulphonate, methanesulfonate salt or 3-aminobenzoic acid ethyl ester ( $C_9H_{11}NO_2 \bullet CH_4SO_3$ )). A white powder best transported across borders in its original container.

MSc = abbreviation for manuscript.

MScr = abbreviation for manuscript.

MSDS = Material Safety Data Sheet (documents from the manufacturer of a chemical outlining its toxicity, volatility, flammability and other safety related information. Posted in laboratories where such chemicals are used; formalin is probably the commonest and most toxic chemical encountered by ichthyologists).

MSP = abbreviation for maximum spawning potential of a fish stock (spawning potential ratio, q.v., or % MSP (the ratio of spawning potential per recruit under a given fishing regime relative to the spawning potential per recruit with no fishing)).

MSS = plural of MS.

MSST = abbreviation for minimum stock size threshold or  $B_{threshold}$ . At stock sizes below  $B_{threshold}$ , the stock is considered to be overfished.

MSY = maximum sustainable yield (the average or maximum catch that can be removed under existing environmental conditions over an indefinite period without causing the stock to be depleted, assuming that removals and natural mortality are balanced by stable recruitment and growth. Abbreviated also as  $Y_s$ . Also called maximum equilibrium catch, maximum sustained yield, sustainable catch).

MT = metric ton (tonne; 1000 kilogrammes, 0.984 long tons, 1.1023 short tons or 2204.6 pounds).

mtDNA = mitochondrial DNA.

muciferous = producing or containing mucus.

mucin = a product of mucus cells which, when mixed with water, forms mucus. A glycoprotein.

muck = black and completely decomposed organic matter.

muco-cartilage = a special elastic tissue forming the skeleton of the ammocoete head in Petromyzontiformes. It metamorphoses into true cartilage and other tissues.

mucophagy = feeding on the mucus of fishes or invertebrates, e.g. sabre blennies, *Plagiotremus*, deliberate or incidental mucophagous cleaners such as Pomacanthidae and Chaetodontidae.

mucosal fold = a fold of tissue lining the intestine; well-developed in some fish larvae giving a characteristic striated or rugose appearance.

mucous = the adjective for mucus. Often used interchangeably with mucus.

mucous canal = an old name for lateral line canal (*q.v.*) based on the false concept of their function being to produce mucus.

mucous cell = an epidermal cells which secretes mucin, which, when mixed with water forms mucus. Mucous cells are derived from the basal layer of the epidermis and, when mature, communicate with the surface by a lumen. Mucus accumulation may transform the cell into a flask-shaped goblet cell.

mucous pit = an old name for the pores of the lateral line system.

mucous pore = an old name for a lateral line pore. See also mucous canal.

mucous tubule = a special kidney tubule which produces a granular slime-like substance in the Gasterosteidae.

mucronate = pointed, abruptly terminated by a sharp spine.

mucus = a slimy, clear, slippery fluid formed by the mixture of mucin, a glycoprotein, from the mucous cells and water. The adjective, mucous, may not always be used in conjunction with nouns.

mud = detrital material made of particles smaller than sand, i.e. less than 0.0625 mm in diameter.

mud fish = 1) partially split, salted and pickled cod, caught in autumn and thus too late to cure but kept in salt brine for spring curing. Often kept for home consumption in Newfoundland.

mud fish = 2) any of several species of fish which frequent, or burrow into, mud.

mud taste = an off taste in fish, often found in post-spawning individuals suffering from muscle breakdown and depletion of fat reserves.

mudding = a behaviour of bonefish (*Albula vulpes*) where they stir up the marl, a greyish-white, soft and adhesive sediment found on the flats where bonefish live.

muddle = to make turbid or muddy.

muddler = a wet fly with a clipped deer-hair head resembling a sculpin. Used to catch salmonids, basses, pike, and others.

muddler minnow = muddler.

muddy flavour = a tainted flavour or odour of fish flesh caused by the chemicals geosmin and 2-methylisoborneal released by microorganisms in the water and taken up by fish through their gills. These chemicals have very low detection thresholds, about 1 nanog/l. Found in fresh and brackish water fish as the responsible Cyanobacteria (*Anabaena* (geosmin) and *Oscillatoria* (2-methylisoborneal)) do not grow in sea water. Also called earthy flavour.

mudfish = a general term used to describe a wide variety of unrelated fishes that burrow in mud.

mudflat = an area of flat muddy land exposed at low tides and a habitat for fishes such as mudskippers.

muds = a cloud of mud in clear water caused by bottom-feeding fish such as bonefish.

muggie = moggie.

mugil = from the Latin mulgeo, to suck, as in bottom deposits. Hence the name Mugilidae for the mullet family.

Müller's duct = the duct out of which the oviduct is formed. Also called Müllerian duct.

Müllerian duct = Muller's duct.

Müllerian mimicry = the condition where unpalatable species resemble each other, and are recognised and avoided by predators. The chance of being damaged by an uneducated predator is reduced by more than one species having the same appearance.

Müllerian process = a spring-like modified portion of the parapophysis of the 4th vertebrae involved in the elastic spring apparatus, q.v., for sound production.

Müllerian protractor = the muscle inserted on the Müllerian process, originating on the neurocranium in most Siluriformes with the elastic spring apparatus, or on the expaxial musculature near the dorsal fin in *Synodontis* catfishes. It pulls the process forward, enlarging the gas bladder and, when relaxed it allows the spring-like process to recoil, causing the gas bladder to pulsate and emit sound.

mullet = 1) a member of the family Mugilidae.

mullet = 2) an unattractive but strangely popular hairstyle, short hair on the top, front and sides of the head, followed by a long drape of hair on the back, reaching at least to the middle of the spine.

mullet head = a stupid person, from an imaginary fish lacking brains.

mullet millionaire = 1) a nickname for two amateur fish farmers of Roman times who grew red mullet and carp in ponds, species which fetched enormous prices among epicureans.

mullet millionaire = 2) a person who becomes rich through a lottery win or some other type of windfall without hard work or inheritance.

mullethead = mullet head.

mulletry = a fish farm for mullet (Mugilidae).

mulm = detritus (dead vegetal matter, faecal pellets and uneaten food forming a greyish gunk on the bottom of aquaria and in filter mechanisms).

multi- (prefix) = many, multiple.

multi-day fishing = an allowance (by permit) for a recreational fisherman to possess more than one daily bag limit of fish while on a fishing trip that lasts longer than one day.

multi-monofilament = a small number of monofilament strands twisted loosely together to make up netting for static gear, e.g. tangle nets.

multi-rig bottom trawl = a single vessel tows two or more trawls using outriggers on each side.

multi-strand line = a bundle of very fine fibres comprising a fishing line. The hooklength spreads out in water to become almost invisible and is soft to touch on the lips of fishes. However it may tangle and water soluble glues can be used to keep the strand together until the rig is cast into the water when it dissolves away.

multicellular gland = an innervated group of cells in a round capsule at the end of a jelly-filled tube opening to the skin surface of Gymnarchidae and Mormyridae; electric sense organ. Also called snout organ or mormyromast.

multicuspid = bearing several points or cusps, as in teeth.

multicuspidate = bearing several points or cusps, as in teeth (more correct form of the above).

multifid = divided into several, having branches or forks, e.g. a spine or the lateral line.

multifurcation = a node in a tree that connects more than three branches. If the tree is rooted or directed, one branch represents the ancestral lineage and the other branches descendent lineages. A multifurcation often results because of a lack of data to resolve the branches although it could be the simultaneous splitting of several lineages. Also called polytomy.

multinomen = in nomenclature, a name composed of several words; a polynomial.

multinominal = adjective for multinomen.

multiple clutch = fractional spawning (release of eggs at intervals, usually over several days or weeks. This allows more, smaller and immature eggs to be carried in a limited abdominal cavity space as the intervals enable the smaller eggs time to mature; and once shed, eggs mature at different times and thus may avoid complete loss of a season's spawning to predators. Also called batch spawner).

multiple hook = a fish hook with two or more points.

multiple mark = multiple zone.

multiple original spellings = in nomenclature, two or more different original spellings for the same name.

multiple oviparity = a system in sharks where females retain several pairs of egg cases in the oviducts, the embryo growing to an advanced stage. The eggs may hatch within a month of laying, e.g. in the scyliorhinid *Haleelurus* in aquaria, although not known in the wild. May occur naturally in whale sharks.

multiple ring = multiple zone.

multiple weight increment = fish yield of a certain species (kg)/stocked quantity of the fish (kg)

multiple zone = a number of closed zones, compared to the size of the calcified structure and the distance of the annuli, which is regarded as one annulus.

multiplication sign ( $\times$ ) = 1) times, multiplied by.

multiplication sign ( $\times$ ) = 2) in nomenclature, used to indicate hybrids between two species with the female parent's scientific name first, e.g. in a hybrid formula *Rutilus rutilus*  $\times$  *Abramis brama*.

multiplier reel = a reel where one turn of the handle causes multiple turns of the spool and so retrieves line rapidly.

multiplying reel = multiplier reel.

multipurpose vessel = a fishing vessel equipped with more than one kind of gear, e.g. seiner-handliner, trawler-drifter, trawler-purse seiner.

multiradial = radiating out in several directions.

multiserial = arranged in several rows or series.

multiseriate ctenii = said of scales having two or more rows of ctenii.

multispecies = 1) in nomenclature, an unofficial term for a group of two or more species that remain distinct taxa despite hybridising and producing fertile offspring.

multispecies = 2) a set of broadly sympatric species that exchange genes naturally (not nomenclatural).

multispecies fishery = a fishery where more than one species is caught at the same time. Most fisheries are of this nature as gear is not usually selective for single species but the term is used for fisheries deliberately directed to catching more than one species.

multivoltate = many generations per year.

multivoltine = multivoltate.

mummy = fish were a staple item in ancient Egyptian diets and were also mummified as representatives of various gods, e.g. *Lates niloticus* (Latidae) was worshipped as a form of the goddess Neith at Esna, giving rise to the town's Greek name of Latopolis and *Schilbe mystus* (Schilbeidae) was the fetish of the delta nome of Mendes, whose local goddess was called Hatmehyt ("foremost of the fishes") who is usually depicted with a *Schilbe* on her head. Fish-eating was banned in areas where certain fish species were venerated.

mun = 1) 4 kg or about 9 pounds, used in the Persian Gulf for fish weights in the market.

mun = 2) decaying fish used as manure (Cornish dialect).

mun fish = mun (2).

mund = mun.

Munsell system = a commercially manufactured system of colour notation with colour chips enabling naturalists to describe colours of living specimens with some degree of comparative accuracy.

muntel = muntle.

muntle = a line thrown from a boat to a man on the bank. This line is attached to a net that has been payed out from a boat across a river. A Severn River, England salmon-fishing term. See also debut line.

muntelman = the man to whom the muntle is thrown.

murderer = fluke bar (an iron rod with hooks dragged along the sea floor to impale fish such as flatfishes).

muria = a fish sauce of the ancient world made with tuna in brine allowed to ferment. Fish blood, spices and herbs may be added. See also garum and liquamen.

murmillo = a Roman gladiator with a characteristic crested and broad-rimmed helmet, resembling a fish. Often paired in combat against a retiarius (*q.v.*) who wielded a net and resembled a fisherman.

Murphy's Law = states, if something can go wrong it will. Also known as Finagle's 2nd law (there are no 1st or 3rd laws).

murt = a small fish (Shetland and Orkneys dialect).

murt fin = the second dorsal fin, especially of a salmon (Scottish dialect).

murther = murderer (Scottish dialect).

*mus.* = abbreviation for *museum*, meaning museum.

muscle = fish have three types of muscles, cardiac (only in the heart), smooth (in the viscera, blood vessels or mixed with other tissues), and striated or skeletal (arranged to move the bones). Cardiac muscle has striations, branching fibres and nuclei in the centre of the fibres. Smooth muscle has unstriated fibres, centrally located nuclei and are smaller than striated muscles. Striated muscles has large, longitudinal fibres with cross striations and several, peripherally located nuclei.

musculus = muscle. Abbreviated m.

musculus lateralis superficialis = the red muscle of the myomere, *q.v.*

musculus lateralis profundus = the white muscle of the myomere, *q.v.*

museum abbreviation = museum collections of fishes are catalogued with an abbreviation of the museum's name (an acronym) and a number; these acronyms are listed in Leviton *et al.* (1985) and Leviton and Gibbs (1988), e.g. CMNFI = Canadian Museum of Nature Fish Collection. CMNFI 1979-0102 indicates the 102nd collection (one or more specimens and species) catalogued, but not necessarily collected, in 1979.

museum acronym = museum abbreviation.

mustard herring = herring packed in mustard sauce.

*mut. char.* = abbreviation for *mutatis characteribus*.

*mutatis characteribus* = with the characters changed (by); emend., *emendatus*. Abbreviated as *mut. char.*

mute as a fish = fish lack sound production compared to mammals and birds (slang).

muttsucker = a hybrid composed of two native species of sucker from the Colorado River basin, U.S.A. (flannelmouth and bluehead) with an introduced sucker (white). The white sucker acts as a genetic "bridge" between the two native suckers which do not hybridise. A hybrid swarm may develop and take in other sucker species too.

mutualism = a form of symbiosis in which both species are benefited without injury, e.g. relationship between *Amphiprion* and certain sea anemones.

muzzle = the snout of a fish; rarely used.

my = million years (ago).

MYA = abbreviation for million years ago.

mybp = abbreviation for million years before present.

mycobacteriosis = tuberculosis (a mycobacterial infection found in aquarium fish, for example (*Mycobacterium marinum* and *M. fortuitum* are known causes). Fish are lethargic, show little interest in food, exhibit wasting, hollow bellies, popeyes, colour loss, deformities, ulcers, frayed fins, yellow or dark nodules on the body and eyes, and secondary infections. Some fish, such as salmonids, may show no external symptoms although the disease is fatal from internal lesions. Mycobacteriosis is a zoonose, a disease capable of infecting humans, entering through skin abrasions and causing skin granulomas. Poor aquarium conditions can allow this infection to take hold. Fish can be treated with proprietary medicines for mild cases, by antibiotics but severe cases may be untreatable. The fish tank needs disinfection. Also called fish TB).

myelenocephalon = the posterior part of the hindbrain. Details of the brain structure of a fish (*Danio rerio*) may be found in Wullmann *et al.* (1996). See also brain.

myelin = white, fatty material covering nerves.

myid = meese.

mylk = milk (2).

mylohyoid groove = old term for Meckelian groove.

myocomma (plural myocommata) = myotome (but see below).

myocommata = 1) the transverse membrane between the lateral muscle segments of the body; myoseptum.

myocommata = 2) plural of myocomma.

myodome = 1) a cavity in the skull under the brain in the postorbital region of the skull in which lodge the rectus muscles (anterior, posterior, superior and inferior) of the eye and, anteriorly, the ethmoid for anchoring the oblique muscle (superior and inferior). Actinopterygii typically have well-developed myomeses but some taxa, such as *Acipenser*, *Lepisosteus* and *Siluridae* have lost them.

myodome = 2) a small, subconical, perichondral bone formed in the ethmoid cartilage and making the anterior wall of the myodome.

myoliquefaction = a deterioration and softening of fish tissues caused by *Kudoa thrysites*, a myosporean parasite in marine fishes. This results in economic loss but the parasite does not infect humans.

myomere = a lateral, W-shaped muscle segment of the body, separated from its neighbours by fibrous connective tissue. The upper central point of the "W" is directed anteriorly. Superficial fibres are separated from deeper ones, the former being red muscle or *musculus lateralis superficialis* with smaller fibres and more blood vessels, and the latter white muscle or *musculus lateralis profundus*. The two layers are separated by a septum of fibrous connective tissue. Red muscle is thickest at the lateral line, thinning dorsally and ventrally. Myomeres attach to the myocommata and thus indirectly to the vertebrae. Some are supported by neural and haemal spines. These myomeres are the muscles used in movement.

myomere count = in lampreys the myomeres between the 7th gill (first counted is that whose posterior septum passes entirely behind the groove) and the one whose lower posterior angle lies wholly or partly above the cloacal slit. Sometimes myomeres are counted between the eye and the cloaca, although this count seems to have little to recommend it.

myomere formula = preanal plus postanal myomeres equals total myomeres in larval fishes.

myorhabdoi = slender bones projecting backwards and downwards in the myocomma from each neural spine.

myosepta = plural of myoseptum.

myoseptum (plural myosepta) = the partitioning tissue between the muscle blocks; myocommata.

myotome = one of the embryonic or adult lateral muscle segments of the body.

myr = abbreviation for a million years (ago).

myriameter = 10,000 metres or 6.214 miles.

myriare = 1,000,000 m<sup>2</sup> or 1090 hectares.

mysaell = mesell.

mysale = mesell.

mysel = mesell.

mysell = mesell.

mythicotype = a joke name in nomenclature for the type of a mythological creature.

myxobacteriosis = a disease of fish caused by any member of the Myxobacteria, e.g. coldwater disease, columnaris disease, fin rot, peduncle disease, etc.

myxopterygia = plural of myxopterygium.

myxopterygium (plural myxopterygia) = the copulatory organ or clasper of Elasmobranchii and Holocephali; rod-like extensions of the inner side of the pelvic fins. It is composed of the long stem cartilage, a shorter distal cartilage, the dorsal terminal cartilage (or rhipidion, fan-shaped for dispersing sperm in a radiating spray during copulation), the hook-shaped terminal cartilage (or claw) which has a cutting edge on its inner margin, and the narrow, sharp spur. The claw and spur serve to anchor the clasper in the female oviduct and a groove along the clasper enables the sperm to reach the oviduct. The siphon contracts to propel sperm into the oviduct. See also tenaculum.

myxosomiasis = whirling disease in salmonids caused by *Myxosoma cerebralis* or by other *Myxosoma* spp.

myxosporidiosis = a disease of fishes caused by the sporozoan protozoan *Myxosporidium*.

## N

N = number of fish studied; n is often used.

N = the letter represents a wriggling eel and in Phoenician and Hebrew is called nun (a fish).

n = 1) annual mortality rate (the ratio between the number of fish which die during a year from causes other than fishing and the number alive at the beginning of that year. Also called annual natural mortality rate, conditional natural mortality rate, seasonal natural mortality rate).

n = 2) number of fish studied; N is often used.

n = abbreviation for the haploid chromosome number.

n. = 1) abbreviation for *nobis*, meaning to us.

n. = 2) abbreviation for *nomen*, meaning name.

n. = 3) abbreviation for *nova*, *novus*, *novum*, all meaning new.

n. = 4) abbreviation for *nudum*, meaning naked.

n.b. = *nota bene*, take notice, note well. Also NB.

*n. g.* = new genus.

*n. n.* = abbreviation for *nomen novum*, or new name; or *nomen nudum*.

*n. nov.* = abbreviation for *nomen novum*, or new name.

*n. sp.* = abbreviation for *nova species*, meaning new species.

*n. v.* = abbreviation for *non visus*, meaning not seen.

n-cut = a net cut at right angles to the general course of the netting. Also called point cut.

nabert = nebert.

nabby = a wooden club for killing salmon (Scottish dialect).

nadiral = lowest point or lowest side; occasionally used for the lower side in Pleuronectiformes.

naev = sieve.

naeve = sieve.

NAFO = Northwest Atlantic Fisheries Organization, responsible for setting quotas for some stocks that are outside Canada's 200-mile limit, straddle the line, or are of mainly foreign interest.

naint = a term used in heraldry when a fish is shown in a horizontal position (from the French for swimming). See also haurient.

nail knot = the knot used to attach a leader to a fly line or to the butt section (*q.v.*) which rolls out well when casting. Can also be used or to attach line to hooks, swivels, snaps and lures where a double loop through the eye provides a cushion for extra knot strength. A nail or needle can be used to wrap the line around to facilitate tying this knot. Various websites have animated steps showing how to tie this knot.

nail knot loop = a form of nail knot used when attaching a large lure to heavy line. A normal nail knot will not allow the lure to swing freely. Various websites have animated steps showing how to tie this knot.

naïve = without prior exposure or experience, e.g. to a parasite.

naked = lacking scales.

naked name = *nomen nudum*.

nam pla = a pungent, salty amber-coloured fish sauce from Thailand made from fermented anchovies.

namaribushi = small whole skipjack tuna, or chunks of bigger ones, boiled and then slowly roasted to remove some of the moisture (Japan).

Namazu = the catfish deity living under Japan and held down by a giant rock. The wriggles of this catfish caused earthquakes.

name = nomenclaturally, the word or words that constitute the scientific designation of a taxon.

name, available = a scientific name of an animal satisfies the provisions of the International Code of Zoological Nomenclature, including publications of the name after 1757 in a latinized form or arbitrary combination of letters constructed so it can be treated as one, in a work consistently applying binomial nomenclature, not first published in a synonymy, etc.

name, book = some common names of rare or deepsea species are artificial "book names" as these species are never seen by the general public. They are coined simply to provide a consistent format in books where common names are used or to provide a means of communication with people unfamiliar or uncomfortable with Latin names.

name, common = the vernacular name of a species, varying from place to place, by language and over time. Scientific names, in contrast, are in Latin or latinised Greek world-wide and are subject to rules of usage that cannot apply to common names. Some common names of rare or deepsea species are artificial "book names" as these species are never seen by the general public. They are coined simply to provide a consistent format in books where common names are used or to provide a means of communication with people unfamiliar or uncomfortable with Latin names. Official common names are an attempt to standardise usage and some countries have recommended lists. The Latin or scientific name provides accurate identification and should be used at least once in any article to fix the identity of the species being discussed. Of course, popular articles will use names without reference to official lists and restricting the common name to one choice loses diversity, cultural significance, history, etc.

name, invalid = any name for a given taxon other than the valid name, *q.v.*

name, Latin = name, scientific.

name, market = a common name assigned to a fish sold for consumption to encourage sales, e.g. spiny dogfish (*Squalus acanthias*, a shark) became rock salmon.

name, preoccupied = one that is a junior homonym, a name with the same spelling that is erected anew for another taxon.

name, replacement = a new name (*nomen novum*) published or an available synonym adopted to replace an earlier name, and valid only if the latter is preoccupied; commonly applied to substitute names proposed to replace junior homonyms.

name, scientific = the Latin or latinized name of a taxon as opposed to its popular or vernacular name. Consists of two words, the genus name and the species or trivial name, e.g. *Squalus acanthias*, the spiny dogfish. Convention demands that this name be underlined, italicised, in bold face or in some other fashion distinguished from the rest of the printed text.

name, substitute = see name, replacement.

name, valid = the correct name for a given taxon; a taxon may have several available names; but only one of those names (most frequently the oldest) is the valid name.

name-bearer = name-bearing type.

name-bearing type = the type genus, type species, holotype, lectotype, series of syntypes (which, together, form the name-bearing type), neotype, type slide, or hapantotype, that provides the objective standard of reference whereby the application of the name of a taxon can be determined.

name-group = an assemblage of coordinate categories, e.g. species-group.

named fish = certain fish have been named individually for a variety of reasons: these include commerce, artistic need, entertainment, aquariology, etc. These are legion and the category "fictional fish" in Wikipedia gives an extensive list. See babel fish, Blinky, bubba, Charlie the Tuna, Clarissa, Nemo, etc.

nano cube = a small (under 30 gallons) marine aquarium, cheaper than larger ones but difficult to maintain and restricted in the fishes it will support. Also called nano reef. See also pico reef.

nano reef = nano cube.

nap = 1) knap (a shoal or bank on fishing grounds (Newfoundland)).

nap = 2) said of line which, when entangled on the bottom, is pulled taught and then let go suddenly, the recoil causing the hook to spring free (British dialect).

nares = 1) the region behind the back of the top of the head immediately posterior to the occiput.

nares = 2) the thickest part of a fish fillet, just behind the head on each side of the backbone, exposed on heading.

nares = 3) the flap at the end of cod's backbone after the head is removed and the fish split.

nares = 4) see also napes.

nares bone = the bone at the shoulder of a fish that forms the leading edge of a belly flap, *q.v.*, in preparing fish as food. Also called collar bone, lug bone and shoulder bone.

nares cut fillet = a wide angular cut from the gill cover to the vent eliminating the rib cage, or by slicing it from the fillet.

nares fillet = boneless fillets with belly flaps removed.

nerves = the belly wall of fish which appears as wings or flaps when the throat is cut and the belly split open.

naping = cutting through the head and belly as a preliminary to gutting a fish.

nare = sometimes used as the singular form of nares, the plural of naris.

nares = plural of naris.

naris (plural nares) = the nostril. External nares open onto the head, internal nares connect the nasal cavity with the mouth cavity (as in Dipnoi). The median naris of Myxini also opens into the mouth. In other fishes the naris on each side is single and leads into a blind sac or the nares are double and connected to one another, via the olfactory chamber.

narrow face = a Newfoundland term for capelin (*Mallotus villosus*) when the fishing is good. Also called narry face.

narrows = a narrow body of water.

narry face = narrow face.

narsoo = a seven-pronged spear used in India.

naruto = steamed kamaboko (q.v.) prepared as a roll with kneaded and dyed red fish meat rolled into white meat, so that a spiral pattern appears on every cross section (Japan).

narutomaki = naruto.

nasal = pertaining to the nose or olfactory organ.

nasal bone = a paired dermal bone occurring between the premaxilla and the prefrontal, antorbital or lachrymal on either side of the snout and usually enclosing the nares. *Lepisosteus* has three nasals, prenasal or rostral, adnasal or nasal and premaxillo-nasal or antorbital.

nasal bridge = the tissue between the anterior and posterior nostrils. It may be ridged to direct water into the anterior nostril.

nasal canal = the cephalic lateral line canal before the eyes, starting from the interorbital canal, e.g. in Tripterygidae.

nasal capsule = the structure enclosing the nostrils. Also called olfactory capsule.

nasal curtain = a fringed flap extending backwards from the nostril of Rajoidei and Myliobatoidei.

nasal fossa = a groove in which the nostril opens.

nasal head spine = a spine on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line

the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

nasal lamella = one of the flaps of tissue in the nostril.

nasal pit = the cavity in which the nasal rosettes are located and which opens by means of one or two nostrils.

nasal process = a vertical process on the anterior maxillary bone in Holostei (*Amia* and *Lepisosteus*), not homologous with a similar structure in most teleosts called the ascending process.

nasal rosette = the lamellae and associated elements of the nostril. May be radial, arrow-shaped, parallel or bilateral.

naso-postrostral = nasal bone.

nasohypophysial opening = an opening allowing water into the olfactory organ of Petromyzontidae and Myxinidae. Found on top of the head in Petromyzontidae and in front of the head in Myxinidae.

nasolabial groove = a groove which connects the nostrils and mouth opening in some Elasmobranchii where the nostrils and mouth are close.

nasopalatine canal = the canal which joins the nostril to the intestine in Myxini or is a blind sac ending between the anterior end of the notochord and above the branchial region. Also called nasopalatine duct.

nasopalatine duct = nasopalatine canal.

nasoral groove = a rut between the nostrils and the mouth in some Elasmobranchii.

nasopremaxilla = the premaxilla of *Lepisosteus* and *Amia*, formed from a dentigerous premaxilla and the nasals.

natal = of or connected with birth, birthplace, e.g. stream of a fish.

natal stream = stream of birth. Migratory fish often return to this stream which is imprinted on them.

natality = the rate at which new fish are added to population by reproduction.

natant = swimming, or floating on the water surface.

nates = slang for native fish as opposed to hatchery fish, e.g. steelhead, *Oncorhynchus mykiss*.

natio = race, a local population within a subspecies. Sometimes given a Latin name by Old World biologists, but having no nomenclatural significance, e.g. *Salmo trutta natio lacustris*.

national cure = a salt cod product where the salted fish are washed and drained only long enough to remove excess water before drying naturally for several days. Salt content after curing is about 20% (minimum 17%)(Portugal).

national food fisheries = those fisheries in fresh and marine waters belonging to and controlled by a state or by profit motivated agencies.

nationality of catch = a catch of fish has the nationality of the flag of the vessel performing the essential part of the operation catching the fish. Exceptions occur when the vessel is chartered by the host country to augment its fishing fleet or the vessel fishes for the country by joint venture contract or similar agreements and the operation of such vessel is an integral part of the economy of the host country.

native = 1) organisms historically indigenous to an area, e.g. native trout for *Salvelinus fontinalis* as opposed to the introduced brown trout *Salmo trutta*.

native = 2) a species that is a member of the natural community.

native fishery = harvesting of fish by aboriginal peoples for food or cultural use.

native stock = an indigenous stock of fish that has not been substantially affected by genetic interactions with non-native stocks or by other factors, and is still present in all or part of its original range.

natural bait = live bait (living items used as bait on a hook or in some other fashion, e.g. worms, fish, eggs, etc.).

natural cure = national cure.

natural drying = drying of fish by exposure to sun and wind.

natural feeding = pertaining to or of fishes which feed on natural food.

natural fish = a fish spawned by parents in nature as opposed to a hatchery.

natural flow = the flow of a stream as it would be if unaltered by upstream diversion, storage, import, export, or change in upstream consumptive use caused by development.

natural food = all food organisms naturally present in water on which fishes feed.

natural growth increment = in aquaculture, that part of growth which is due to natural food.

natural host = a fish host where the parasite is found under natural conditions (rather than experimentally). Not the same as typical host, *q.v.*

natural key = an identification key that reflects evolutionary relationships within the branching sequence of the key.

natural mortality = a measure of the rate of removal of fish from a population from natural causes, not through fishing. Includes predation, cannibalism, senility, disease, pollution, etc. The balance that must be struck between natural mortality and fishing mortality to ensure an effective fishery is difficult. Natural mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of this fish dying in one year. Instantaneous mortality is the percentage of fish dying at any one time. Natural mortality is very high for young fish, with more than 99% dying in the first few months of life. Natural mortality for recruited fish is fairly steady at about 0.2, i.e. 2 fish in every 10, for groundfish, lower for *Sebastes* spp. (ca. 0.1), and higher for small pelagic fish. At a rate of 0.2, the chance of dying of natural causes in 1 in 5 at whatever age the fish happens to be. For a year class however, at a rate of 0.2, 45% of new recruits would die in less than 4 years from recruitment but 1% would survive more than 23 years.

natural range = the geographical range of a species prior to human disturbance.

natural reproduction = reproduction occurring without human influence.

natural return ratio = an estimate of the ratio of naturally produced spawners in one generation to total natural spawners (both naturally and hatchery produced) in the previous generation.

natural stocking rate = a stocking rate calculated only on the biogenic capacity of a body of water.

natural taxon = a species or group of species having a unique history of evolutionary descent. Two or more such species comprise a clade or monophyletic group.

naturalised = said of an alien or introduced species that has become successfully established, reproducing in the wild.

naturally spawning populations = populations of fish that have completed their entire life cycle in the natural environment without human intervention.

nautical mile = now set at 1852 metres, 1.151 miles or 1 minute latitude of the great circle of the earth. Three nautical miles make one league. The British nautical or Admiralty mile was 6080 feet (1853.18 m) while the U.S. nautical mile was 6080.2 feet (1853.24 m). Abbreviated as INM for international nautical mile.

navicular = boat-shaped.

NB = *nota bene*, take notice, note well. Also n.b.

nap current = a tidal current of decreased range as with a neap tide.

neallotype = alloneotype (an unofficial term in nomenclature for a type specimen of the opposite sex to the neotype (*q.v.*)).

neap high water = the average height of the high waters of the neap tide. Also called high water neaps.

neap low water = the average height of the low waters of the neap tide. Also called low water neaps.

neap tide = a tide of decreased range occurring semi-monthly, between the time of new and full moon. The sun and moon are at right angles to each other so their net gravitational effect on the sea is reduced. The neap tidal range is usually 10 to 30 percent less than the mean tidal range.

near water trawler = a trawler taking voyages of 5-9 days.

Nearctic = the biogeographical realm of North America, excepting southern Mexico.

nearshore fishery = a fishery in Newfoundland carried out between the inshore and offshore waters.

nearshore waters = shallow waters at a small distance from the shore. Also called inshore or onshore waters although the former may be defined as nearer the coast.

neascosis = black-spot disease (the encysted intermediate life history stage of a strigeid trematode found in a fish's skin. The skin develops black pigment over the cysts forming the characteristic spots).

neave = sieve.

nebbard = nebert.

nebert = the necessary quantity of fish bait (Shetland and Orkneys dialect). Also spelled nebirt, nabert, nebbard, nebir and neburd.

nebir = nebert.

nebirt = nebert.

neburd = nebert.

*nec* = abbreviated form of *neque nec*.

necrophagy = eating the dead, carrion-eater.

necropsy = examination and dissection of a dead specimen to determine cause of death or changes due to disease; also used to describe taking of samples for studies such as molecular analyses.

necrotype = a taxon extinct in a particular locality; not a nomenclatural term.

nectobenthic = swimming off the sea bed; also spelled nektobenthic .

neck = 1) fish don't have one, with the arguable exception of seahorses. Some species can move the head and look in different directions despite the lack of a flexible neck, e.g. darters (Percidae).

neck = 2) the narrowing of a placoid scale between its crown and base.

neck = 3) a narrow or constricted part of a structure, as of a bone or a net.

neck = 4) a narrow strip of land connecting a peninsula with the mainland.

neck = 5) a rip, or narrow band of current, flowing seaward through the surf.

neck canal = the one or more ducts in the neck of a placoid scale which radially join the pulp cavity with the exterior and which serve during formation of the scale to contain blood vessel loops.

neck strap = a tissue over the "neck" of some fish embryos which absorbs ovarian milk, q.v., e.g. in *Poecilia reticulata*.

needle = an implement made to hold a quantity of twine and used to knot meshes in a fish net. (Newfoundland).

needle comb = 20-30 needles arranged in rows on a wooden board attached to a board. Used to catch eels in Japan at night. When an eel is sighted using lights, it is struck on the head and coils around the pole in reaction, and so can be seized by the fisherman.

needles and pins= young fish in the shallow water of a river (Scottish dialect).

neeve = nieve.

neflin = dried cod from Newfoundland (Cornish dialect). Also spelled niflin.

negative = in angling, said of fish at the lowest feeding mode, usually because of one or more stress factors in the environment. +

negative estuary = estero (a lagoon with greater salinity at its head than its mouth, since evaporation exceeds precipitation there. Found on desert margins of the American southwest and in Mexico).

neglected name = a validly published name that has been overlooked (*nomen neglectum*).

neglectotype = a joke term in nomenclature for a type specimen that has been uncurated for a long period and only discovered by accident.

nehrung = a spit, a long, narrow strip of land paralleling the coast (German but sometimes used in English texts). See haff.

nei = not elsewhere included. In fisheries catch statistics, refers to catch data that cannot be linked directly to a State or fishing entity, for whatever reason.

neither fish nor fowl = anything not belonging to a particular class or category; indefinite; having no specific characteristics; neither one thing nor the other.

neither fish nor fowl nor good red herring = anything not belonging to a particular class or category; indefinite; indeterminate; to be hesitant or undecided; having no specific characteristics; neither one thing nor the other. May appear as neither fish nor good red herring, neither fish nor flesh.

neive = sieve.

nekton = organisms of relatively large size which have fairly strong locomotory powers (as compared to plankton) and swim in the water column independent of currents, e.g. most adult fishes.

nematodiasis = infestation with nematodes.

Nemo = the clown fish in the Pixar computer-animated movie "Finding Nemo", released in 2003. The movie centres around the efforts of the father, Marlin (naturally a clown fish too and not a marlin but this is Walt Disney not ichthyology) to find his lost son.

neo- (prefix) = new.

neo-holaulacorhizy = a modification of the holaulacorhizid type of tooth root in Chondrichthyes where a shallow median groove and extremely expanded pulp cavity are combined (Herman *et al.*, 1994).

neoallotype = neallotype; neotype is preferred. Information on sex should be garnered separately (allotype being a paratype of opposite sex to the holotype and originally designated by the author, a term not regulated by the International Code of Zoological Nomenclature).

neocotype = a replacement syntype, *q.v.*, designated in the absence of the original type or type series.

neogenotype = an unofficial term in nomenclature for a type species of a genus-group name designated when the original type species was considered unrecognisable.

neoholotype = a new type specimen selected in the absence of the original type. Neotype is preferred.

neomale = a genetically female fish which has been hormonally masculinised to a phenotypic male.

neomorph = a structure, part or organ developed independently, i.e. not derived from a similar structure, part or organ, in a pre-existing form.

neon tetra disease = a disease caused by the sporozoan *Pleistophera hyphessobryconis*, and named after the neon tetra fish in which it was first recognised. Whitish patches appear below the skin (destroying the neon stripe in the eponymous fish), muscle tissue is destroyed (causing contortions and abnormal movements), cysts form and release spores, the spores penetrate

further into the fish and form more cysts, and are eventually spores are released into the water to infect more fish through food.

neonym = in nomenclature, a new name proposed to replace either a junior homonym or a name of a new combination.

neoparatype = a figured specimen used in addition to the neotype. Paraneotype is preferred.

neosyntype = neotype.

neoteny = achieving sexual maturity while the rest of the body is in the juvenile form (the juvenile form of others of the same group).

neotype = a single specimen designated as the type-specimen of a nominal species-group taxon of which the holotype (or lectotype), and all the paratypes, or all syntypes are lost or destroyed or suppressed by the International Commission on Zoological Nomenclature.

nephric myomere = in eel leptocephali, the number of myomeres or muscle blocks anterior to the end of the kidney is a diagnostic character.

nephridium = small excretory organs with flame cells found in invertebrates and Amphioxii.

nephrocalcinosis = precipitation of calcium phosphate in the kidney tubules, causing renal insufficiency; a common condition in fishes.

nephros = the kidney in fish larvae such as leptocephali.

nepionotype = 1) in nomenclature, an unofficial term for the type of the larva of a species-group name.

nepionotype = 2) in nomenclature, an unofficial term for a type specimen which is the larval stage of a species.

*neque nec* = and not, nor. Used in nomenclature to indicate names which are misapplied homonyms or misidentifications by the author (whose name is cited before).

nerisei-hin = rensei-hin (inclusive term meaning the products made from kneaded fish meat, e.g. kamaboko (*q.v.*)).

neritic = pertaining to the shallow waters on or above the continental shelf (as opposed to oceanic organisms) from the low tide level to a depth of 200 metres; shelf fauna.

neritopelagic = inhabiting shallow coastal waters over the continental shelf.

nerka virus = a herpesvirus from landlocked sockeye salmon, possibly the same as herpesvirus disease, *q.v.*

ness = a triangular promontory jutting into the sea, often composed of sand or similar materials.

nessel = a snood of twisted twine fastened to a hook used in fishing for small fish (Cornish dialect).

nessel taker = a mechanism fixed to the beams of a fisherman's cottage for making nessels (Cornish dialect).

nest = 1) a structure created for housing eggs and sometimes young, usually involving some cleaning or grouping of materials such as gravel or weeds, e.g. in Gasterosteidae and many Cichlidae.

nest = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

nester = an ecological group of reproductive guilds (*q.v.*) where the fish build a nest to protect the eggs or defend the eggs attached to the substrate.

net = an open mesh structure formed by cords linked by knots (or other linking methods such as weaving) used for capturing or confining aquatic organisms like fishes.

net and coble = a beach seine used in Scotland for salmon. The coble is a small, flat-bottomed open boat which may be rowed or under power, used to set the net by paying it out as the boat sweeps round in a circle. The net must be kept in motion while being payed out to surround the fish and bring them into shore. Other restrictions apply in this method of salmon fishing (no stones can be thrown to scare fish into the net and no other nets can be used in conjunction).

net bag = a large, bag-shaped net in which surplus cod are temporarily stored until brought ashore from the inshore fishery (Newfoundland).

net buoy = a buoy marking the limit of fish net.

net cage = in aquaculture, an open mesh net suspended from a metal frame. Common in Japan.

net day = the daily catch or use of a net, especially when used as a measure of fishing intensity.

net depth = the distance from the headline to the groundrope in a net of specific design. Usually given as the number of meshes.

net drum = a wide spool over which a trawl or purse seine is hauled in, usually hydraulically powered. Also called net roller or transporter.

net fishery = use of gear other than hook and line to catch cod in Newfoundland.

net fishing = 1) use of a net to catch fishes generally.

net fishing = 2) more specifically, the right of taking fish by one net in a particular stretch of water.

net gallows = a frame on which fish nets are hung to dry in Newfoundland. Also called net horse, scaffold and shear.

net gear site = the place in the sea or fresh water where stationary net gear is located.

net ground = an area of foreshore on which fishnets are spread to dry in Newfoundland.

net hauler = a powered winch pulley for helping to haul in gill nets and drift nets.

net hook = a forked wooden structure used to stretch a fish-net when drying it (Newfoundland).

net horse = net gallows.

net increase (or decrease) = new body substance elaborated in a stock of fishes, less the loss from all forms of mortality (Ricker, 1975).

net lifter = net hauler.

net loft = an area in a building for storing and mending fish nets in Newfoundland.

net mender = a man tasked with repairing nets.

net mending = the repair of nets, usually by hand.

net needle = a specialised form of needle used to make or repair mesh nets by hand. Most nets are now made by machinery.

net pen = a fish rearing enclosure used in lakes and marine areas made of net sides and bottom, supported by floats and anchored to the bottom. Keeps out birds, mammals and other fishes.

net pen cage = net pen or net cage.

net preservation = various techniques and processes used to protect a net from the effects of the environment.

net production = production (the total elaboration of new body substance in a stock in a unit of time, irrespective of whether or not it survives to the end of that time. Also called total production).

net reel = a drum on the deck of commercial fishing vessels on which the net and rigging is wound.

net reservoir = a cloth container on a wooden frame used in carp breeding in China.

net roller = net drum.

net room = a specially designed room for storing, mending and preserving nets.

net rope = a float line made of two ropes of opposite twist to prevent kinking. Also called gill rope.

net sonde = net sounder.

net sounder = a transducer mounted on the trawl headline sending signals by cable or acoustically to a recorder on the trawler. It serves to give information on depth, temperature and fish above and below the trawl.

net washer = an industrial machine used on aquaculture facilities to wash fish nets.

net weight = the weight of the fish itself, i.e. the gross weight minus the weight of any bags, trays, wrappings, etc., cf. gross weight.

net winch = a mechanical winch used to haul and store nets, mostly on trawlers.

net-bag = a large, bag-shaped net in which surplus cod are temporarily stored until brought ashore from the inshore fishery (Newfoundland).

net-fishery = use of gear other than hook and line to catch cod in Newfoundland.

net-gallows = a frame on which fish nets are hung to dry in Newfoundland. Also called net-horse.

net-ground = an area of foreshore on which fishnets are spread to dry in Newfoundland.

net-hook = a forked wooden structure used to stretch a fish-net when drying it (Newfoundland).

net-horse = net-gallows.

net-loft = an area in a building for storing and mending fish nets in Newfoundland.

net-mender = a man tasked with repairing nets.

net-winding winch = net winch.

netting = 1) a mesh of various shapes, sizes, materials and construction methods.

netting = 2) nets used for fishing.

netting = 3) the making of a fish net.

netting = 4) the practice or right of fishing with a net.

netting = 5) lint (netting in the main body of a drift or gill net. Also called body, middle twine, middle yarn, sheet, webbing, yarn).

netting twine = the cord used in making fishing nets.

neuracanth = the neural spine.

neural arch = the arch enclosing the spinal cord on the dorsal surface of the vertebrae. Generally continuous in Chondrostei but separate arches in Teleostei give more flexibility.

Acipenseridae have two canals, the upper for the longitudinal ligament and the one under it for the spinal cord.

neural canal = the spinal cord canal through the neural arches.

neural crest = part of the neural ridge in embryos that differentiates into various tissues including melanophores, peripheral neurons and head cartilage.

neural groove = a mid-sagittal depression on the surface of the anterior neural plate present during early segmentation.

neural keel = an intermediate stage between the neural plate and the neural rod with a triangular cross-section.

neural plate = thickened epithelium forming the earliest dorsal ectodermal primordium of the central nervous system.

neural process = a dorsal projection of the vertebrae, one on each side of the centrum. These unite to form the neural spine.

neural retina = the retinal epithelium sensitive to light that develops from the inner layer of the optic cup. During hatching it forms several sublayers including the inner ganglion cell layer, interneuronal layers, the outer layer of light sensitive cells and the pigment layer.

neural rod = an intermediate stage in the central nervous system between the neural keel and neural tube with a roughly cylindrical shape but not yet hollow.

neural spine = the dorsal spine on top of the neural arch, directed backwards. These spines are bifid posteriorly in Diodontidae. Also called neuracanth and neurapophysis.

neural tube = the primordium of the central nervous system characterised by a cavity and developing from the neural rod.

neurapophyses = plural of neurapophysis.

neurapophysis (plural neurapophyses) = 1) the structure forming each side of the neural arch.

neurapophysis (plural neurapophyses) = 2) the dorsal process of the neural arch, the neural spine.

neurocoel = the space enclosed by the neural tube.

neurocrania = plural of neurocranium.

neurocranium (plural neurocrania) = the portion of the skull surrounding the brain, including the elements that surround the olfactory, optic, orbital or sphenotic, and otic or auditory capsules and the anterior end of the notochord (endocranum) and the series of overlying dermal bones (dermocranum). Also called braincase.

neuromast = a sensory cell with a hair-like process capable of detecting motion or vibrations in the water. The hair is sheathed in a gelatinous cupula terminalis. May be located in a series as a lateral line, either exposed on the skin or enclosed in a tube-like canal opening to the surface through pores, as individual sense organs exposed on the skin or sunk in a depression (pit organ), or in the semicircular canals of the inner ear.

neuromere = a brain subdivision characterised by a swelling bounded by constrictions.

neuropophysis = dorsal projections of the vertebrae which unite to form the neural arch and spine.

neurotoxin = a nerve toxin.

neurulation = the process of forming a dorsal ectodermal neural tube.

neuston = organisms that float or swim in surface waters.

neustophagia = feeding on particulate matter at the water surface.

neutral = in angling, the middle stage of fish activity or when fish can be induced to strike a lure or take a bait.

neutral buoyancy = having the same density as the surrounding water, so it neither sinks nor floats.

neutral buoyancy device = a plastic device used by anglers to determine how much weight is needed to cock a float. Used at home when making up float rigs.

neutral term = a taxonomic term of convenience having no nomenclatural significance or hierarchical rank, e.g. complex, group.

new combination = *combinato novum* (a new name results from a change in rank or position of an epithet from an earlier name, e.g. transfer to a new genus producing a new combination).

new name = *nomen novum*.

new replacement name = *nomen novum*.

new scientific name = a scientific name, available or unavailable, when first proposed for a taxon.

new species = *species nova* (given after the scientific name instead of the authority (who as author of the article is assumed to be the authority). Abbreviated as *sp. nov.* or *sp. n.*).

new style = indicates the Gregorian or modern western calendar. Some older fish literature, especially Russian, is dated by the Julian calendar or old style. This may have taxonomic significance in name priority. The Gregorian calendar came into use in Catholic Europe in 1582 (the day after October 4 became October 15), in England in 1752 but only in 1918 in Russia. Abbreviated as NS.

new tank syndrome = the condition in newly set up aquaria where ammonia and then nitrite levels from fish wastes rise to dangerous levels. New aquaria lack sufficient denitrifying bacteria for about a month after set up. See also old tank syndrome.

new transfer = *translatio nova* (used to indicate a taxon has been changed in position either horizontally to another genus or vertically to a different rank. Abbreviated as *trans. nov.*).

new water = water free of organic waste, e.g. from springs, wells, fresh rainwater, tapwater as opposed to old water. New water facilitates growth while old water restricts growth because of an overcharge of waste products.

New York-style reel = a fishing reel made in New York of the multiplier type characterised by a counter-balanced crank and sometimes swivelling discs to protect the spool bearings and facilitate oiling.

Newcastle kipper = 1) fat herring, split down the back from head to tail, lightly brined and cold smoked. They may be artificially coloured. Marketed chilled, frozen or canned (sometimes packed in edible oil in Germany).

Newcastle kipper = 2) ground meat made into kipper paste.

Newfoundland banks = areas of shoal water forming the offshore fishing grounds of Newfoundland, Canada. Also called Grand Banks.

Newfoundland fish = cod (*Gadus morhua*, Gadidae).

Newfoundland fish-box = a jocular term for a sailing vessel engaged in transporting dried cod to foreign markets.

Newfoundland fishery = the marine fishing industry in Newfoundland waters, especially the cod fishery.

Newfoundland trade = the fishery in Newfoundland, especially the supplying of men engaged in the cod fishery and the marketing of the dried and salted product overseas.

Newfoundland-man = an English West Country migratory fishing vessel or a crew member of such a vessel (Newfoundland).

Newfoundlander = a vessel from, or engaged in, the fish trade with Newfoundland.

newlander = an English vessel fishing seasonally in Newfoundland.

nga-bok-chauk = pieces of fish allowed to putrefy before salting and sun-drying (Myanmar).

nga-pi = ngāpi.

ngāpi = a fermented and salted fish paste from Burma (Myanmar). See also garum, balachong and trāsi.

nibble = a delicate or tentative bite on a bait by a fish.

nibble fish = *Garra rufa* and *Cyprinion macrostomum* (Cyprinidae) in Turkish hot springs in the Kangal area which clean dead skin fragments from humans with psoriasis. Also called doctor fish and kangal fish.

niboshi = small whole fish, often sardines or similar species (or shellfish) boiled in salt solution or sea-water and subsequently dried in the sun (Japan).

niboshi-hin = an inclusive word for products dried after boiling or steaming (Japan).

nice kettle of fish = pretty kettle of fish (a bad state of affairs; a very difficult and annoying situation; something to be considered or reckoned with. From kiddle, a basket set in the opening of a weir for catching fish).

niche = the habitat and role of an organism (food habits, community relationships, etc.); the range of environmental space occupied by a species.

niche overlap = an overlap in resource requirements by two species.

nick point = the point at which a stream is actively eroding the streambed downward to a new base level.

nictitating eyelid = a membrane which covers the eye, an eyelid, found particularly in sharks.

nictitating membrane = a membrane at the front of the eye which can be pulled over the whole eye, e.g. in some Selachii.

nidamental gland = a specialized portion of the oviduct which secretes nourishing and sometimes protective (shell) coverings about the ovum as it moves posteriorly, e.g. in Elasmobranchii and Holocephali.

nidicolous - remaining in the nest for some time after hatching, cf. nidifugous.

nidification = nest building, e.g. preparation of a gravel concavity by *Micropterus*; evacuation under boulders by *Cottus*; barrel-like structure of weeds, sand or twigs glued together by *Gasterosteus*.

nidifugous = leaving the nest almost immediately after hatching, cf. nidicolous.

niev = nieve.

nieve = to catch fish in the hand (Scottish dialect). Also spelled neive, niev, niv, naev, naeve, neave and neeve.

niflin = neflin.

nifurprazine = a chemical (1-(5-Nitro-2-Furyl)-2-(6-Amino-3-pyridazl) ethylene hydrochloride) used to combat bacterial infections in fishes, particularly with *Aeromonas salmonicida*. Also called carofur.

night crawler = a large earthworm used as bait in angling, cf. angleworm. Effective for trout, walleye and bass in North America.

night fishing = fishing at night for those species that are active then, e.g. light-sensitive walleye or scent-sensitive catfishes.

night-line = fishing line with baited hooks left in the water to catch fish over night.

nigiri-zushi = fingers of rice topped with wasabi and raw or cooked fish; the common form of sushi.

nip = a bite in fishing.

nipper = a thick, narrow band of cloth or knitted wool worn around the fingers or palm by a fisherman to protect his hand in line-fishing (Newfoundland).

nipping = biting, usually as a territorial or stress behaviour in fish, occasionally as a feeding mechanism.

nishikigoi = the complete Japanese word for koi (ornamental carp especially bred over centuries for colour patterns and body form). The word means brocaded carp and koi come in various named varieties based on colour, pattern and scales.

nitrate poisoning = although nitrate is less poisonous to fish than ammonia and nitrites (see nitrogen cycle), in high concentrations it is harmful and may also indicate the presence of other toxic waste products (most aquarium test kits measure ammonia, nitrites and nitrates for the nitrogen cycle, not a wide range of toxic wastes). A level of 50 mg/l is the maximum for fish tolerant of nitrates, ideally the aquarium should have levels below 25 mg/l, and for nitrate-intolerant species much lower. Nitrate poisoning is usually a chronic effect, causing poor health and growth, a reluctance to breed, susceptibility to disease from other causes and is probably the cause of black chin disease, q.v. Excessive algae growth is a sign of too much nitrate. Changing the water is a simple solution and nitrates can be removed from tap water by reverse osmosis or the appropriate ion-exchange resin.

nitrofuran = one of a series of related chemicals used against gram negative bacteria in fishes.

nitrogen cycle = in an aquarium, fish wastes, decaying food and plant material produce ammonia and nitrites which are harmful to the fish. *Nitrobacter* bacteria convert these wastes into a relatively harmless nitrate in a mature aquarium (see above). The danger to fish lies in a new aquarium where the bacteria and filtration systems have not been established long enough to be effective in the conversion. Build up of sufficient numbers of bacteria can take several weeks and a new aquarium can have a toxic ammonia surge. Test kits allow the aquarist to measure the chemical health of the aquarium.

nitrogen narcosis = recovery of fish suddenly from deep water can cause expansion of gases by rapid decompression, harming the fish. Applies to humans too.

nitrogen supersaturation = water in which the concentration of dissolved nitrogen exceeds the saturation level of water. Excess nitrogen can harm the circulatory system of fish.

*Nitrosomonas* = the genus of nitrifying bacteria found in biological filtration systems in aquaria.

niv = sieve.

NL = abbreviation for notochord length.

*no.* = abbreviation for *numero*, meaning number. May be used to indicate separate parts of a publication.

no commercial value = a phrase used on packages of preserved scientific specimens sent through the mail to other institutions for purposes of a customs declaration.

no take reserve = no take zone.

no take zone = a marine protected area where catches or removal of organisms are prohibited. Abbreviated as NTZ.

no-effect level = conditions or concentrations of a chemical which have no adverse effect on fish life (usually in the statistically significant sense).

*nob.* = abbreviation for *nobis*.

nobbin = a fleshy portion of dried salt fish, small enough to be sold by measure. See cod nobbin (Yorkshire dialect).

nobbing = removing the head and guts from such fatty fish as herring by partially severing the head, then pulling it away with guts attached but the gonads left in.

*nobis* = to or of us; used after a scientific name to indicate the author's responsibility for its description, or for an action or proposal.

nocardiosis = a chronic systemic bacterial disease caused by *Nocardia asteroides*. Lesions are formed internally and externally and additionally fish show popeye and anorexia. Some fish, such as salmonids, may show no external symptoms although the disease is fatal from internal lesions. Nocardiosis is a zoonose, a disease capable of infecting humans, entering through skin abrasions and causing skin granulomas.

nocioceptor = a peripheral nervous receptor, sensitive to noxious stimuli and reporting to the central nervous system where pain is perceived and motor responses initiated. Fish can sense pain but these receptors provide no evidence of a psychological experience of pain.

nocturnal = active at night; pertaining to the night; lasting only one night.

nocturnal mooring = a night-time behaviour in Monocanthidae where they orally attach to sponges, tunicates, rope and fishing line in nature as a means of resting from currents.

nodd = nud.

nodose = having nodes or projections.

nodulose = having small nodules, swellings or knobs.

*nom.* = abbreviation for *nomen*, meaning name.

*nom. abort.* = abbreviation for *nomen abortivum*.

*nom. ambig.* = abbreviation for *nomen ambiguum*.

*nom. car.* = abbreviation for *nomen carentum*.

*nom. conf.* = abbreviation for *nomen confusum*.

*nom. confus.* = abbreviation for *nomen confusum*.

*nom. cons.* = abbreviation for *nomen conservandum*.

*nom. conserv.* = abbreviation for *nomen conservandum*.

*nom. dub.* = abbreviation for *nomen dubium*.

*nom. hybr.* = abbreviation for *nomen hybridum*.

*nom. illeg.* = abbreviation for *nomen illegitimum*.

*nom. illegit.* = abbreviation for *nomen illegitimum*.

*nom. inq.* = abbreviation for *nomen inquirendum*.

*nom. inval.* = abbreviation for *nomen invalidum*.

*nom. legit.* = abbreviation for *nomen legitimatum*.

*nom. monstr.* = abbreviation for *nomen monstrositatum*.

*nom. non planta* = abbreviation for *nomen sed non planta*.

*nom. non rite public.* = abbreviation for *nomen non rite publicatum*.

*nom. nov.* = abbreviation for *nomen novum*.

*nom. nud.* = abbreviation for *nomen nudum*.

*nom. oblit.* = abbreviation for *nomen oblitum*.

*nom. provis.* = abbreviation for *nomen provisorium*.

*nom. rej.* = abbreviation for *nomen rejectum*.

*nom. rejic.* = abbreviation for *nomen rejiciendum*.

*nom. rev.* = abbreviation for *nomen revivisco*.

*nom. superfl.* = abbreviation for *nomen superfluum*.

*nom. tant.* = *nomen tantum*.

*nom. triv.* = *nomen triviale*.

**nomad** = fish without a home range that move widely.

*nomen* (plural *nomina*) = name. Used in nomenclature (see following).

*nomen abortivum* = a name contrary to the International Code of Zoological Nomenclature as the Code existed at the time of publication. Abbreviated as *nom. abort.*

*nomen alternativum* = alternative name (two names for the same taxon, of the same rank, published simultaneously by an author). Abbreviated as *nom. alt.*

*nomen ambiguum* = an ambiguous name, one used by different authors for different taxa over so long a period that it has become a persistent cause of error and confusion. Abbreviated as *nom. ambig.*

*nomen approbatum* = one given approval by the International Commission on Zoological Nomenclature for use in nomenclature. Abbreviated as *nom. approb.*

*nomen carentum* = without a name. Used in bibliographic citations to indicate a taxon without a formal name. Abbreviated as *nom. car.*

*nomen collectivum* = collective group (an assemblage of nominal species that cannot be placed with certainty in known genera; names proposed expressly for collective groups are treated as generic names).

*nomen confusum* = confused name a name based on elements of more than one species from which it is impossible to select a lectotype. Abbreviated as *nom. conf.* or *nom. confus.*

*nomen conservandum* = a name preserved by the International Commission on Zoological Nomenclature and entered on their Official Lists even though it strictly contravenes one or more provisions of the Code. Abbreviated as *nom. cons.* or *nom. conserv.*

*nomen correctum* = a corrected name or 'improved' name, an available name which is a mandatory and allowable emendation of an imperfect name or of a taxonomic name higher

than family (which is not subject to name form and ending regulations). Does not depend on transfer in taxon rank or assignment (an emended name).

*nomen dubium* = a doubtful or dubious name not certainly applicable to any known taxon; a name which cannot be recognized because of inadequate description, figure, etc. May possess availability conducive to uncertainty and instability. Abbreviated as *nom. dub.*

*nomen hybridem* = hybrid name, formed by combining words from different languages. Abbreviated as *nom. hybr.*

*nomen hypertelicum* = mataeonym (an unofficial term in nomenclature for a superfluous name introduced when there was an older valid name based on the same type (typonym, q.v.) or on another member of the same group (metonym, q.v.)).

*nomen illegitimum* = illegitimate name, a validly published name that must be rejected for the purposes of priority in accordance with the International Code of Zoological Nomenclature. Abbreviated as *nom. illeg.* or *nom. illegit.*

*nomen imaginatum* = a made-up scientific name to facilitate teaching and discussion of nomenclature.

*nomen imperfectum* = an imperfect name, an available name which when originally published met all mandatory requirements of the International Code of Zoological Nomenclature, i.e. met all criteria of availability but which contained some defect needing correction, such as names incorporating hyphens, diacritical marks or apostrophes, higher taxon names using an incorrectly formed stem.

*nomen inquirendum* = a name which should be investigated. Abbreviated as *nom. inq.*

*nomen invalidum* = invalid name, a name that is not validly published or is unavailable. Abbreviated *nom. inval.*

*nomen inviolatum* = an inviolate name, all available names not subject to any sort of alteration from their originally published form, i.e. they were correct as originally published and need no correction or emendation.

*nomen legitimatum* = legitimate name, a valid name published in accordance with the provisions of the International Code of Zoological Nomenclature. Abbreviated as *nom. legit.*

*nomen legitimum* = *nomen legitimatum*.

*nomen monstrositatum* = a scientific name based on a monstrosity (a physically abnormal specimen). Abbreviated as *nom. monstr.*

*nomen negatum* = a denied name, an unavailable name which has incorrect original spellings as defined by the International Code of Zoological Nomenclature.

*nomen neglectum* = a neglected name, a validly published name that has been ignored or overlooked.

*nomen non rite publicatum* = not properly published name, used to indicate that a name has not been validly published according to the provisions of the International Code of Zoological Nomenclature. Abbreviated as *nom. non rite public.*

*nomen novum* = a new name which is published to replace an earlier name (and valid only if the latter is preoccupied) and which is expressly proposed as a replacement name; a new name, not to be confused with a new species, or a new genus, etc., which represent new taxa. Commonly applied to names proposed to replace junior homonyms. Abbreviated as *n. n.*, *n. nov.* or *nom. nov.*

*nomen nudum* = a naked name, a name that, if published before 1931, was not accompanied by a description, definition, or indication, or if published after 1930, is not accompanied by a statement that purports to give characters differentiating the taxon; or is not accompanied by a definite bibliographic reference to such a statement; or is not proposed expressly as a replacement for a pre-existing available name. A *nomen nudum* is not an available name, and therefore the same name may be made available later for the same or a different concept; in such a case it would take authorship and date from that act of establishment, not from any earlier publication as a *nomen nudum*. Abbreviated as *n. n.*, *n. nov.* or *nom. nud.*

*nomen nullum* = a null name, an unavailable name which as defined by the Code is a non-demonstrably intentional change of an original spelling, i.e. a form of incorrect subsequent spelling.

*nomen oblitum* = a forgotten name, an unused senior synonym rejected under the provisions of the International Code of Zoological Nomenclature. Formerly a senior synonym not once applied to a particular taxon as its presumably valid name for the immediately preceding 50 years (other than in a synonymy, listing in an abstracting publication or a nomenclator) and to which taxon has been currently been applied a junior synonym by at least 5 different authors in at least 10 publications during the immediately preceding 50 years. Such a name, unless otherwise ruled, is to be rejected for the purposes of the Law of Priority but not for those of the Law of Homonymy. No longer recognised. After 1 January 2000 applied to a name, unused since 1899, which as a result of an action taken under the Code does not take precedence over a younger synonym or homonym in prevailing usage; the younger name which takes precedence over the *nomen oblitum* may be called a *nomen protectum*. A *nomen oblitum* remains an available name. Abbreviated as *nom. oblit.*

*nomen perfectum* = a perfect name, an available name which when originally published met all mandatory requirements of the Code and needed no correction of any kind, but which is validly alterable by change of ending.

*nomen praecoccupatum* = a preoccupied name or junior homonym, a name already in use for another taxon based on a different type.

*nomen protectum* = a protected name applied to a name which has been given precedence over its unused senior synonym or a senior homonym relegated to the status of *nomen oblitum*.

*nomen provisorium* = provisional name, a name proposed provisionally in anticipation of the acceptance of the taxon concerned at a future date. Abbreviated as *nom. provis.*

*nomen rejectum* = *nomen rejiciendum*.

*nomen rejiciendum* = 1) a name which, under the provisions of the International Code of Zoological Nomenclature, cannot be used as a valid name and which is set aside in favour of another name; a name which, as a matter of taxonomic judgment, is either treated as a junior subjective synonym of a name used as valid or is believed not to be applicable to the taxon under consideration. Abbreviated as *nom. rejic.* and *nom. rej.*

*nomen rejiciendum* = 2) a family or genus name that should replace another well-known name but which is rejected in favour of a *nomen conservandum*, q.v. Abbreviated as *nom. rejic.*

*nomen revivisco* = name revived, used of a name revived or reinstated, e.g. from an earlier synonymy.

*nomen sed non planta* = used to indicate that a author has applied the name to a taxon other than that to which the type of the basionym, q.v., belongs.

*nomen substitutum* = substitute name, any available name whether new or not, proposed as replacement for any invalid name, such as a junior homonym. A substitute name proposed specifically for a preoccupied name is a *nomen novum*.

*nomen superfluum* = superfluous name, a name incorrectly applied to a taxon. When first applied the taxon included the type of another name which should have been used under the provisions of the International Code of Zoological Nomenclature. Abbreviated as *nom. superfl.*

*nomen tantum* = name only, used of names not applied in the sense of their type; a misapplied name. Abbreviated as *nom. tant.*

*nomen translatum* = a transferred name, an available name which has been altered (usually in ending only), the change depending on transfer from one taxonomic rank to another, or from one taxon to another. Authorship and date remains as for the original name.

*nomen triviale* = trivial name, the specific name or specific epithet. Applied by some authors in the same sense as vernacular name. Abbreviated as *nom. triv.*

*nomen vanum* = a vain name, an available name consisting of unjustified but intentional emendation of a previously published name. It has status in nomenclature with its own authorship and date.

*nomen vetitum* = an impermissible name, an unavailable name published for divisions of the genus group other than genus and subgenus, which are not accepted by the International Code of Zoological Nomenclature.

nomenclator = 1) a list of scientific names used for nomenclatural purposes rather than taxonomic ones.

nomenclator = 2) a person compiling a nomenclator.

nomenclator = 3) an obsolete term for one who creates scientific names.

nomenclatorial = pertaining to a nomenclator. Formerly applied to nomenclatural matters.

nomenclatural = pertaining to nomenclature; nomenclatural act.

nomenclatural act = a published act which affects the nomenclatural status of a scientific name or the typification of a nominal taxon; available nomenclatural act is one that is published in an available work; invalid nomenclatural act is any nomenclatural act which is not valid under the provisions of the International Code of Zoological Nomenclature; unavailable nomenclatural act is one published in an unavailable work; valid nomenclatural act is one that is accepted under the provisions of the Code, i.e. the earliest available act not contravening any provision of the Code.

nomenclatural filter = a flow diagram showing the steps necessary to form the correct name of a taxon under the International Code of Zoological Nomenclature.

nomenclatural hierarchy = the ranks of taxa in order as defined by the International Code of Zoological Nomenclature.

nomenclatural novelty = a new name, description or diagnosis.

nomenclatural status = the status of a scientific name, nomenclatural act or work according to the provisions of the International Code of Zoological Nomenclature.

nomenclatural synonym = homotypic synonym (a synonym based on the same nomenclatural type).

nomenclatural type = the single element of a taxon to which its name is permanently attached; type; nomenifer; onomatophore.

nomenclature = the system of scientific names applied to taxa, or the application of these names.

nomenifer = the name bearer; nomenclatural type; type; onomatophore.

nomenspecies = a species defined on the characters of the type specimen; typological species.

*nomina* = plural of *nomen*.

nominal = 1) in fisheries studies, refers to quantities as they are reported without any analysis or transformation, e.g. nominal catch, nominal effort.

nominal = 2) of or in names, used in nomenclature.

nominal catch = the sum of the catches that are landed, not including unreported discards, before any analysis. The nominal catch may differ from actual landings because of errors in reporting, the use of some fish in fish meal and other complications.

nominal effort = fishing effort or vessel carrying capacity that has not been standardised. When catchability changes through, for example, changes in gear technology, trends in nominal effort can be misleading as a picture of trends in exploitation.

nominal form = in name only; a named taxon of questionable status. The word nominal is often used to imply that although the species have been named, they may not be valid taxa, e.g. the genus x has 20 nominal species implies one or more may be synonyms.

nominal taxon = the taxon defined by its type, type-genus in the case of family, type-species in the case of genus, and type-specimen in the case of species.

nominate = nominotypical; used in older editions of the International Code of Zoological Nomenclature.

nominate form = name-bearing taxon, e.g. the nominate subspecies has the same specific and subspecific epithets and is the oldest valid name for the species.

nominifer = nomenifier.

nominotypical = of a subordinate taxon, that it contains the type of a subdivided higher taxon, and bears the same name, with a suffix in family-group names which is amended according to rank.

*non* = not (of), indicates in a synonymy that the name that follows is a homonym of an earlier author.

*non aliorum* = not of other authors. Abbreviate as *non al.*

*non.....nec* = neither (of).....nor (of), used in citing a homonym.

*non vide* = *non visus*.

*non vidus* = *non visus*.

*non viso* = *non visus*.

*non visus* = not seen. Used to indicate specimens or bibliographic references which were not seen by the author but are included for completeness or on the authority of others. Abbreviated as *n. v.*

non-allocated species = those fish species for which a total allowable catch has not been specified. Does not include species whose fishing is prohibited.

non-commercial fisherman = a fisherman who is not licensed and fishes for himself. Includes anglers.

non-consumptive use = use of aquatic resources without consumption, e.g. scuba diving, observing fishes migrations in streams, or even valuing natural resources without observing them.

non-consumptive water use = use of water that does not deplete water supplies, e.g. fishing.

non-contracting party = a country that has not signed and is not obligated to aid by the terms of an international fishing agreement.

non-enzymatic browning reaction = browning (discolouration of fish, especially of dried or canned products, caused by a deteriorative reaction between amino groups of proteins and carbonyl groups of sugars during storage. There are also flavour changes and loss of some nutritive value. Known also as the Maillard reaction).

non-established = introduced species not reproducing.

non-game fish = any wild fish not classified as a game fish by the state.

non-harvestable = pertaining to a fish stock or a part of a stock not available for commercial use.

non-indigenous = alien (any species not native (indigenous) to the area under consideration, often a politically defined area (country, province, state, etc.). It includes exotic, introduced, transplanted, non-native, invasive and escaped species. May be used in the sense of a species that has not become established in the wild in the new area).

non-monetary benefits = benefits from a fishery that cannot be measured in economic terms, e.g. enjoyment of a lifestyle.

non-native = said of a species deliberately or accidentally introduced by a human agency to an area outside its natural range and which is reproducing. See also alien.

non-occlusible = the teeth of the upper and lower jaws not fitting together and so preventing mouth closure.

non-point source pollution = polluted runoff from agriculture, mining, timber harvesting and other sources that are not confined sources.

non-predatory fish = a species of fish not normally feeding on other fishes.

non-pressure stock = any stock large enough to allow unrestricted fishing.

non-reporting = the proportion of captures not reported to the appropriate authorities, e.g. tagged fish recovered but tags not turned in.

non-retention = for conservation purposes, fish caught by anglers must be returned alive to the water. Also called catch and release, closed to retention and daily limit 0.

non-selective feeding = a way of feeding in which no choice as to the kind of food occurs.

non-spawner = any mature fish which does not spawn.

non-squamous = lacking scales.

non-target species = species for which the gear is not specifically set, although they may have immediate commercial value and be a desirable component of the catch.

non-trophic = fasting, or periods when a fish does not eat, e.g. non-parasitic lampreys that do not feed as adults.

nondescript = not yet described; used in older literature for an undescribed species.

nonextant = no longer existing; applied to specimens in a collection.

nonindigenous = non-indigenous.

nonnative = non-native.

nonparasitic lamprey = a lamprey (*Petromyzontiformes*) which does not feed as an adult but relies on food reserves stored as an ammocoete, reproduces and dies.

nonsquamous = non-squamous.

nonwithdrawal use = use of water resources that does not require their diversion, e.g. conservation of fish.

noodle rod = a long, soft, light action fishing rod used for light lines.

noodling = capturing fish by hand, often in murky waters under logs and boulders or in mud holes; may be restricted to use of a hook or snare type device, with or without a short attached line, manipulated by hand when a person is in or under the water. See also grabbling, hand-fishing and hogging.

Nor-Loch trout = not a fish but a cant phrase for a joint or leg of mutton, bought for a club of people who used to meet near the North Loch in Scotland.

Nordmore grate = a groundfish excluding device used on small-meshed shrimp trawls introduced in Canada in 1993.

norm = an obsolete term for a specimen chosen to illustrate the variation of a species.

normal tide = a non-technical term synonymous with tide; use discouraged.

norsel = a short piece of line on a drift net used to attach the hanging line to the head or float line at regular intervals. Also called ossel.

northern cod = cod stocks of the waters adjacent to the north-east coast and Labrador, especially those of the Hamilton Banks.

northern pikes = 1) more than one *Esox lucius*.

Northern Pikes = 2) a Canadian rock group from Saskatchewan.

norward = a particular type of net (Sussex dialect).

Norwegian cured herring = hard cured, fat summer herring that have empty guts having been kept alive in the sea.

Norwegian milker = milker herring (Dutch cured herring with the gonads left in the fish. Usually packed in small barrels with about 12 fish for the North American delicatessen trade. Also called melker).

Norwegian silver herring = light cured herring that keeps well at room temperature.

Norwegian sloe = hard-cured large herring.

nose = the northeast projection of the Grand Bank of Newfoundland lying outside the Canadian 200-mile fishing zone. See also tail.

nose velocity = water velocity as measured in front of a fish.

nostril = naris.

*nota bene* = take notice, note well. Abbreviated as n.b. and NB.

notal = dorsal, pertaining to the back.

notation = 1) using signs and symbols to represent numbers, measurements, etc.

notation = 2) a tag added to a scientific name, usually after the author, indicating taxonomic or nomenclatural status, e.g. emend. for emended.

notch = 1) an indentation, usually in a fin, dividing it into two parts or lobes.

notch = 2) wedge (a small, cut-out and lens-less portion of the pupil margin of the eye. This widens the field of vision and allows more light to enter the eye, rather than falling on the iris. Usually found antero-ventrally for improving forward vision. Found in various species of salmonids and cyprinids, for example. Also called pimple. See also aphakic space).

notche = notch (2).

note = a scientific publication shorter than a paper.

notice action = an action that a fishery manager can take without passing an amendment to existing regulations because the action was pre-specified, e.g. closing a fishery if catches exceed a set limit.

notochord = the skeletal rod consisting of a sheath firmly packed with cells which lie above the gut and below the nerve cord. The notochord is persistent when it remains as a continuous skeletal support (e.g. Amphioxii, Holocephali, Acipenseridae, Petromyzontiformes, etc.) and is constricted when displaced by vertebral centra, occupying anterior and posterior cavities.

notochord length = the distance from the snout tip to the posterior tip of the notochord. Abbreviated as NL.

notopterygia = plural of notopterygium.

notopterygium (plural notopterygia) = dorsal fin(s) (the unpaired fin(s) on the midline of the back. In Pleuronectiformes it is on the opposite side to the anus. In Centriscidae the hind end of the fish has been rotated under the fish so the dorsal fin is on the under surface. Abbreviated as D, D1, D2, or D3 respectively for the only, first, second or third dorsal fins (or their rays and spines). It functions to prevent rolling).

*nov.* = *nova*, *novus* and *novum*, all meaning new.

*nov. n.* = *nomen novum*.

*nov. sp.* = *nova species*, meaning new species (*species nova* is to be preferred).

*nov. spp.* = *nova species*, meaning new species (*species nova* is to be preferred).

*nova* = new, used when describing a new taxon, a new combination or a new name. Abbreviated as *n.* or *nov.*

Nova = a term used in the eastern United States for wet cured cold-smoked salmon, in reference to the source of much of the salmon, Nova Scotia.

novel food = in food inspection, any food including fish, fish products and associated microorganisms, that have no track record of safe usage in the way they were manufactured, prepared, preserved or packaged by a process that has not been previously applied to that food, and causes the food to undergo a major change or a food or microorganism that has been genetically modified.

ovie = a Nova Scotia fishing craft (Newfoundland).

*novum* = new; and see *novus*.

*novus* = new. Note the ending changes with the gender of the noun, hence *nomen novum* and *species nova*. Abbreviated as *nov.*

nr = number.

NTZ = no take zone (a marine protected area where catches or removal of organisms are prohibited).

nubbin = bass (*Micropterus* spp., Centrarchidae) too short to meet tournament standards; usually less than 14 inches (ca. 36 cm). Also called baby, dink, throw back, pop corn, and slick.

nubble = a small lump or protuberance, e.g. on the head of sculpins.

nuchal = 1) pertaining to the nape.

nuchal (plural nuchalia) = 2) extrascapula (one of a series of small bones bordering the posterior margin of the skull roof in primitive Teleostomi. They apparently originate from enlarged scales. One of 2-8 bones known variously as cervicals, postparietals, scale bones, supratemporals or tabulars). Also called nuchalium.

nuchal disc = found in Siluridae.

nuchal gap = the gap between the cranial and thoracic armour in Placodermi.

nuchal head spine = a spine on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

nuchal hump = a hump of tissue behind the head seen in some spawning or fast-current fish, e.g. Cyprinidae, Salmonidae, Cichlidae.

nuchal thorn = a strong spine on the nape in Rajidae.

nuchalia = plural of nuchal.

nuckie = nucky.

nucky = a fish hook (Shetland and Orkneys dialect).

nuclear family = where both parents equally share the duties of caring for the young; usually formed by monogamous, open-water brooders, although exceptions are common, e.g. in the Cichlidae. Sexes are difficult to separate on external experience. Also called parental family.

nuclear predator = the main predator on a fish. See also follower.

nucleus = 1) the centre part of a scale, the first part to appear in growth; the focus.

nucleus = 2) the core or primordium of an otolith; no longer used. Also called kernel.

nud = the pull of a fish on a fishing line, a slight jerk, a nibble (Shetland Isles dialect).

*nudum* = naked. Abbreviated as *n.*

nugget = bite (a small piece of fish breaded or coated with batter, weighing less than 1 oz. Of various shapes such as round, square, or irregular. May be cut from regular blocks or blocks of minced fish. Generally sold by count, 25-35 per lb. Also called cubes, petites, and tidbits).

nuisance species = any introduced species that affects the native species adversely.

null name = *nomen nullum*.

number-at-age = the number of fish in each age class of a stock, in a particular year.

numericklature = an attempt to express the classification of animals in numbers, so that each taxon name is represented by a numerical code, the structure of which indicates its taxonomic position, rank and affinities.

*numero* = number. Abbreviated as *no*.

numerotype = an unofficial term in nomenclature for a type specimen known only by a collection number, having been lost or destroyed. The collection number indicates that it once existed.

nun buoy = a buoy tapered at each end; a red nun buoy indicates the starboard side of the channel when moving upstream from the sea.

nuoc-mam = a clear, amber, fermented fish sauce of Vietnam, made by stacking small fishes in alternate layers of salt flavouring ingredients with spices added. Decanting the digesting enzymes takes several months.

nuptial = associated with breeding - nuptial coloration, nuptial tubercles, etc.

nuptial dress = the breeding colours, tubercles and other attributes found on fish in the breeding season.

nuptial efflorescence = nuptial tubercle.

nuptial stripe = a coloured stripe, often seen in cichlids, which becomes prominent during courtship.

nuptial tubercle = breeding tubercle (usually small, raised, epidermal structures on regions of the head, body, or fin rays where two individuals come in contact. May consist of aggregations of non-keratinized epidermal cells, the same with a light, superficial keratinized cuticle, or with substantial number of fully keratinized cells that are organized to form a discrete, usually conical cap. Breeding tubercles may function to maintain body contact between the sexes during spawning; in the defence of nests and territories; in the stimulation of females in courtship; and in some forms perhaps in sex and species recognition. Found in 15 families of 4 orders; Salmoniformes, Gonorynchiformes, Cypriniformes, and Perciformes (Wiley and Collette, 1970)).

nursery = 1) an area favoured for birth or egg deposition where young can grow.

nursery = 2) a pond system intermediate between the hatchery and grow-out stages in aquaculture.

nursery phase = culture of postlarvae from metamorphosis to stocking in on-growing ponds or release in the wild.

nursery pond = nursery (2).

nutrient theft = the effect of a parasitic infection in fishes reducing, for example, egg and clutch size.

nutritional gill disease = hyperplasia of gills caused by a deficiency of pantothenic acid in the diet.

nutritional requirement = organic compounds and minerals necessary in the diet for the optimal development, growth and reproduction of a fish.

nycthemeral = a physiological time unit, 24 hours made up of one day and one night.

nyctipelagic = pertaining to organisms that migrate into surface waters at night.

nyctoepipelagic = migrating from deep waters to the epipelagic zone at night.

nymph = an artificial fly made to sink below the surface and imitate immature insects (true nymphs).

nymphing = 1) the feeding of trout on nymphs near or on the stream bed.

nymphimg = 2) fishing with an artificial fly resembling a nymph and weighted to sink.

nystagmus = fixation of the eye on an object while the body is rotating and the return of the eye to its normal position when the eye has rotated to its anatomical limit.

## O

O = Ordovician, a geological period within the Palaeozoic ca. 504-441 million years ago.

OA = the upper, ventro-lateral row of photophores running above the ventral series from just behind the operculum to above the anal fin.

Oannes = the foremost of the the fish men who brought civilisation to the Babylonians. Lived on land during the day but had to return to water at night. Had a human form but wore a cap resembling a fish head and a long fish-skin cape. Became the fish god Dagon later. See also Atargatis.

ob- (prefix) = toward, over, to, against, e.g. dorsal obbasal scales in Mugilidae are large modified scales at the dorsal fin origin.

objective synonym = each of two or more names with different spelling applied to one and the same taxon. Objective synonyms are the two or more synonyms used on the same type.

oblige = limited to; dependent on, e.g. *Notropis hudsonius* is an obligatory freshwater fish, not being capable of entering the sea. Opposite of facultative.

obligate lecithotrophic live bearer = a reproductive guild (q.v.) where eggs are fertilised internally and develop in the female until the end of the embryonic phase or later. There is no maternal-foetal nutrient transfer (yolk provides food). There is some specialisation for

intrauterine respiration, excretion and osmoregulation. Weight decreases during embryonic development, e.g. *Poecilia reticulata*. See also facultative lecithotrophic live bearer.

obligate parasite = a parasite that cannot lead an independent existence. Compare facultative parasite.

obligate synonym = a homotypic synonym (*q.v.*); a nomenclatural or objective synonym (*q.v.*).

obligatory = adjective for obligate.

oblique rows of scales = diagonal scale rows (the almost vertical rows of scales slanting backwards and downwards across the sides of the body. Divided into scales above the lateral line starting at the front of the dorsal fin (from, but not including, the scale in the mid-dorsal row, to but not including, the lateral line scales) and below the lateral line similarly ending at the front of the anal fin. The number of transverse rows themselves along the body may also be counted).

obliterative colouration = a graded colouration or shading that washes out relief, giving the appearance of a flat surface. Useful in concealing fish from predators.

observer = a government official/scientist onboard a fishing vessel who collects scientific information and measures harvest amounts to ensure that established catch levels are not exceeded. May also quantify bycatch and discards, and collect tagged fish.

obsolescent = almost wanting; minute.

obsolete = rudimentary, hardly developed, faintly marked.

obstruction = fastener (an obstruction on the sea floor that can foul and damage fishing gear).

obtuse = blunt, having an angle of more than 90 degrees.

Occam's razor = other things being equal, the simpler hypothesis is chosen. Also known as the Law of Parsimony.

occidental = western or westerly.

occipital = 1) a median bone on the upper surface of the back of the head.

occipital = 2) pertaining to the occiput.

occipital canal = supratemporal canal (the cephalic lateral line canal (*q.v.*) running across the top of the head joining the lateral canals. Abbreviated ST).

occipital condyle = the portion of the occipital bone which articulates with the first vertebra (atlas).

occipital crest = a vertical blade on the occipital bone formed from ossification of the connective septum separating occipital myomeres.

occipital joint = the joint between the occiput and the vertebral column.

occipital organ = the organ in male Kneriidae consisting of a cup-shaped opercular organ surrounded by neuromasts and a wedge-shaped, laterally protruding, postopercular organ located behind the gill opening. It serves to hold the male and female together during copulation, apparently functioning as a suction cup.

occipital pit = a cavity in the hind portion of the upper surface of the skull. Apparently of a sensory function. Found in certain Agonidae, e.g. *Bothragonus*.

occipital region = the posteriormost part of the neurocranium, comprising the exoccipitals, basioccipital, occipital, dermosupraoccipital and supraoccipital bones, enclosing a large part of the brain and the membranous labyrinth and connecting to the vertebral column.

occiput = the back end of the top of the head. Often marked in bony fishes by a line separating scaly and scaleless portions of skin. The adjective is occipital.

occlude = 1) to bring together or close, e.g. jaws.

occlude = 2) to block or prevent passage, e.g. blood in a blood vessel.

occlusal = relating to the biting or grinding of tooth surfaces or the bringing of the opposing surfaces of the teeth of the two jaws into contact.

occlusible = the teeth of the upper and lower jaws fitting together and so allowing mouth closure.

ocean deeps = deep sea areas from 6000 to 10,000 metres.

ocean intercept fishery = a fishery in the ocean directed at stocks of migratory fishes on their way to spawning streams.

ocean perch = a market name for redfish species (*Sebastes* spp., Scorpaenidae) of the western Atlantic Ocean.

ocean ranching = ranching at sea (commercial raising of fishes. Usually juvenile fish are released to a natural habitat for growth to a harvestable size).

ocean ranging = the release of hatchery-reared juveniles into the sea for growth to marketable size.

ocean run = 1) salmon still in the ocean.

ocean run = 2) a pack of random weight and size fish products.

ocean take = the portion of the total harvest for a species or stock that occurs in marine areas.

ocean type = chinook salmon (*Oncorhynchus tshawytscha*) populations primarily migrating to the ocean as sub-yearlings, although yearling migrants do occur in some populations. Once in

the ocean, they tend to migrate along the coastlines rather than move directly offshore. They have fewer vertebrae (<70) than stream-type chinook salmon (>70). Also called ocean-type fish.

ocean-maturing = steelhead (*Oncorhynchus mykiss*) that enter fresh water with well-developed gonads and spawn shortly thereafter; commonly referred to as winter steelhead.

ocean-type fish = an anadromous fish that bears no evidence indication on its scales (or other ageing structures) of an extended freshwater residence early in its life. See also river-type fish.

[oceanarium](#) = a large seawater aquarium.

oceanaut = an underwater researcher, explorer or swimmer. Also called aquanaut.

oceanic = 1) offshore, the ocean beyond the continental shelf.

oceanic = 2) of, like or near the ocean.

oceanic desert = tropical regions of the ocean (zones of anticyclonic circulations) where zooplankton biomass is low (25-100 mg/m<sup>3</sup>).

oceanic island = an island in the ocean formed by breaking away from a continental landmass, by volcanic action, by coral formation or by a combination of factors.

oceanic reef = a reef that develops adjacent to deeper waters, often in association with oceanic islands.

oceanic species = species distributed and caught mainly beyond the shelf and/or which migrate extensively across the open ocean. They may have a key stage of their life cycle close inshore and yield large catches in coastal waters. These resources are essentially pelagic for most of their life cycle but some demersal oceanic resources exist on sea-mounts.

oceanic system = waters deeper than 200 m, beyond the shelf break, removed from the effects of surrounding continents and the sea floor.

oceanic zone = the ocean deeper than 200 metres.

oceanodromous = marine fishes which make migrations wholly in the sea, e.g. *Clupea*, *Conger*, *Thunnus* (Myers, 1949).

oceanography = the study of the oceans, its physical features and phenomena. May include biology and ichthyology in some definitions.

oceanology = oceanography (Russia).

ocellate = with ocelli.

ocelli = plural of ocellus.

ocellus (plural ocelli) = an eye-like spot, usually rounded with a lighter border, e.g. the ocellus on the wings of some Rajidae.

ochre = powdered haematite (iron ore) mixed with a liquid to form a rough type of paint. The liquid used included fish oil, among others.

Ockham's razor = Occam's razor.

octacuspid = with 8 cusps or points, e.g. teeth of the characid *Cheirodon*.

octavo-lateralis system = the sensory system comprising the lateral line and inner ear. The lateral line responds to changes in water pressure and displacement while the inner ear senses sound and gravity. Neuromasts are the basic sensory unit comprising a base of cells bearing a sensory hair or cilium covered by a dome-shaped cupula.

ocular = pertaining to the eye or orbit.

ocular bulb = eyeball.

oculonarial = the region between the eyes and the nostrils; the lateral expansion of the head in Sphyrnidae.

odd fish = an eccentric (slang).

odd-year = fish that spawn in odd-numbered years, e.g. pink salmon, whose distribution is variable although their abundance tends to increase at lower latitudes in both Asia and North America.

odd-year run = a population of fish that returns to its natural spawning grounds in odd numbered years, such as the pink salmon.

odds fish = an oath (archaic).

odonts- (prefix) = tooth.

odontes = tooth-like structures, e.g. superficial outgrowths of scales, rays and bones in Denticipitidae.

odontode = the integumentary or skin teeth of conodonts and various fish groups, sometimes lengthened and thickened to form spines. Odontodes have the customary enamel(oid), dentine and pulp cavity structure. However, spongy bone may also be involved and the term may mean slightly different things in different taxa.

odontoid = placoid scale (a type of scale, typically thorn-shaped, found on the skin of Elasmobranchii and claspers of Holocephali. Consists of a spine and a basal plate which is usually rhomboidal. It contains a pulp cavity and is composed of an inner layer of dermal bone, a middle layer of dentine and is covered by enamel-like vitrodentine. Also and less preferably called dermal denticle).

odorant = an odorous substance giving a characteristic smell; fragrant; yielding an odour.

odour = 1) in commercial preparations, the fish species and type of cure has a characteristic odour. Dried heavy-salted and green heavy-salted fish have a salty odour, slack-salted fish have a neutral to cheesy odour and light-salted fish have a neutral to slightly salty odour.

odour = 2) the characteristic smell of fish on the hands can be removed by rubbing them on stainless steel (or carefully on a knife in the field).

Oe = Oannes.

oecotype = ecotype (a population adapted to a restricted habitat as a result of natural selection within a local environment. Nothing to do with taxonomy).

oedema = a swelling; abnormal accumulation of serous fluid in the interfibrillar spaces of connective tissue. Also spelled edema.

oenogarum = garum (*q.v.*) mixed with wine.

oesophagus = that tubular portion of the gut between the pharynx and the stomach. Also spelled esophagus.

off colour = water conditions such as brown with mud from runoff, green from algal blooms and black from tannic acid.

off flavour = 1) the unacceptable muddy or musty flavour of some fish flesh from pond-raised species such as carp and catfish. The flavour may be caused by blue-green algae in the diet and can be removed by holding the fish in running water for 1-2 weeks. May be hyphenated.

off flavour = 2) spoiled or decaying fish. Associated with oxidative rancidity of lipids, bacterial action, pollutants in the flesh, blue-green algae blooms, etc. May be hyphenated.

off odour = the smell version of off flavour. May be hyphenated.

off-channel habitat = fish habitat not in the main stream channel with water for only part of the year but a refuge for young fishes, e.g. Pacific salmon.

off-channel pool = a pool constructed adjacent to the main flow and connected with it, serving as a protected area for rearing fish.

off-flavour = off flavour.

off-reef = reef slope (the reef seaward of a reef crest).

off-station release = release of fish away from a hatchery, *cf.* on-station release.

offal = 1) a term used in fish processing for viscera, skin, bones and trimmings which are discarded.

offal = 2) less valuable, coarser fish as opposed to prime or choice fish.

offal = 3) the residue of rendered cod livers.

offer = 1) a strike by a fish at a bait or lure.

offer = 2) Newfoundland slang for offshore, islands, the most seaward of an object, or distant fishing ledges.

Official Correction = a correction, issued by the International Commission on Zoological Nomenclature, of an error or omission in a previously published Opinion, *q.v.*

Official Index = a list of names or works rejected by rulings of the International Commission on Zoological Nomenclature. The following are compiled and maintained:- *Official Index of Rejected and Invalid Family-Group Names in Zoology*, *Official Index of Rejected and Invalid Generic Names in Zoology*, *Official Index of Rejected and Invalid Specific Names in Zoology*, *Official Index of Rejected and Invalid Works in Zoological Nomenclature*.

Official List = a list of available names or works which have been ruled on by the International Commission on Zoological Nomenclature. The following are compiled and maintained:- *Official List of Family-Group Names in Zoology*, *Official List of Generic Names in Zoology*, *Official List of Specific Names in Zoology*, *Official List of Works Approved as Available for Zoological Nomenclature*.

Official Register = a record of information about names and nomenclatural acts maintained by the International Commission on Zoological Nomenclature.

official text = a text in any language which has been authorised by the International Commission on Zoological Nomenclature. All texts in whatever language are equal.

offprint = a separately printed copy of a scientific paper which has also appeared in a journal.

offset hook = a hook offset to the right when viewed from the top of the hook with the eye towards the observer is called kirbed; the opposite offset is reversed. A hook that is not offset is called straight or flat. Kirbed or reversed hooks are all the same to fish but fishermen have strong preferences. Offset hooks are more likely to strike home on fast-biting fish while straight ones work better with slow-biters and chewers. Also flatfish mouth anatomy makes offset hooks more effective. However offset hooks lack the strength of straight ones and can be harder to set in bony or muscular mouths. Offset hooks tend to rotate if trolled or if in a current which may be either an advantage or not.

offset nail knot = a form of nail knot used to connect abruptly tapering lengths of line. See also nail knot and double nail knot. Various websites have animated steps showing how to tie this knot.

offshore = waters away from the shore but under a country's jurisdiction.

offshore barrier = a bar parallel to shore high enough to be above high water. Also called barrier island and offshore beach.

offshore beach = offshore barrier.

offshore current = any current flowing away from shore.

offshore fishery = a fishery taking place beyond coastal waters requiring fairly large vessels.

offshore waters = waters located well beyond the shore, seaward of nearshore or inshore waters.

offstream fish farming = breeding, rearing and farming of fish in offstream fresh, brackish or saline water.

oftake = a channel by which water is removed.

ogival = adjective for ogive.

ogive = 1) a pointed arch, used to describe mouth shape, e.g. in Mugilidae.

ogive = 2) a distribution curve in which the frequencies are cumulative.

ogon = ornamental carp or koi (*q.v.*), being a single colour metallic fish.

-oid (suffix) = like, e.g. percoid means perch-like.

oikos = habitat.

oil = fish oil is any oil obtained from fishes, usually from the liver, but in fatty fishes from the body, or from fish wastes. Used in fish feeds, edible fats, soaps, paints, leather work and making linoleum.

oil fryer = a metal container filled with hot coals, lowered into a barrel of cod livers, or gurry butt, to assist in the rendering process. The heat helped in the extraction of oil which floated to the surface and could then be scooped off. Modern processes use direct steam injection.

oil globule = a sphere of fat or oil in the yolk of some fish eggs. Variable in number, size, position and colour and so a useful character for identification.

oily fish = fish with a high fat content, having oil or fat around the gut and in the flesh as well as concentrated in the liver. An oily fish fillet may contain up to 30% oil. Oily fish are rich in omega-3-fatty acids and a good source of vitamins A and D, and so are particularly beneficial in human diets compared to white fish, *q.v.* Often pelagic species.

oil rat = a person who processes cod liver oil, especially transferring it from one container to another (Newfoundland).

old arm = cut-off (2) a lake formed by the closure or cutting off of a bend in a river).

old fourlegs = the coelacanth, *Latimeria chalumnae*, so called because of its leg-like fin bases.

old river = a river with a low gradient and low erosive energy, characterised by flood plains. See also youthful, mature and rejuvenated rivers.

old salt = 1) salt used in pickling fish that has been stored for three years.

old salt = 2) and elderly or experienced sailor or fisherman.

old style = time reckoned according to the Julian calendar; subsequently replaced by new style (reckoned according to the Gregorian calendar and now in use in the West). Most scientific papers operate on the Gregorian or new style calendar but Russia only adopted the Gregorian system in 1918 and some of their nineteenth century papers and records are asynchronous by 11 days. This can be confusing when attempting to validate type material since catalogues, publications and labels with the types in jars can have different dates. Abbreviated as OS. See also new style.

older synonym = an earlier synonym that cannot be used as the name for the taxon under the provisions of the International Code of Zoological Nomenclature.

old tank syndrome = accumulation of organic acids, excess nitrates, and other products in an aquarium, causing a gradual decline in pH or a sudden pH crash. Can be avoided by regular partial water changes. See new tank syndrome.

old trout = 1) nothing to do with trout, a disparaging term for an unattractive, older and sometimes rich, woman, or an unpleasant, and troublesome older woman. See also trout.

old trout = 2) a familiar form of address to a male friend, often as "my old trout", "me old trout".

old water = water with organic waste that restricts growth, cf. new water.

oldest name = the first available name for a taxon; the senior name.

olfaction = the sense of smell; chemoreception by nasal organs.

olfactory = pertaining to the nasal organs or the sense of smell.

olfactory bulb = a large organ of smell, e.g. in sharks. This is the most anterior part of the brain but is distinct from the telencephalon while anteriorly it merges with the olfactory nerve.

olfactory capsule = cartilaginous skeleton about the nostrils in Elasmobranchii. Also called nasal capsule.

olfactory cavity = the space occupied by the olfactory rosette.

olfactory lamella = one of a series of lamellae lined by olfactory epithelia and forming the olfactory rosette. Absent in some fishes such as *Belone belone*, *Gambusia agiffi*, *Poecilia reticulata*, *Ammodytes lancea* and *Syphonostoma typhle*.

olfactory nerve = cranial nerve I, conducting odour stimuli from the olfactory organ to the brain.

olfactory organ = the organ of smell.

olfactory pit = a shallow depression on the snout of larval fish from which the olfactory organ develops.

olfactory rosette = nasal rosette (the lamellae and associated elements of the nostril). May be radial, arrow-shaped, parallel or bilateral.

olfactory ventilation sac = an extension of the olfactory cavity, often characteristic of inactive bottom dwellers living in still water such as flatfishes, dipnoans, and eels but also found in clupeids, salmonids, mugilids and scombrids. Primarily used for ventilation but also produce mucus. There may be up to four sacs, usually the additional sacs are smaller but in Osmeridae the sole accessory sac is larger than the main sac. Also called accessory olfactory sac.

Oligocene = a geological epoch within the Tertiary Period ca. 38-26 million years ago.

oligo- (prefix) = few, several, somewhat, little.

oligohaline = 1) organisms tolerant of only a moderate range of salinities.

oligohaline = 2) brackish water with a salinity of 0.5 to 3.0 (or 5.0) parts per thousand from ocean-derived salts.

oligohaline = 3) sea water having a salinity of 17 to 30 parts per thousand.

oligomictic = a lake having relatively stable stratification with only rare periods of circulation.

oligophagous = restricted diet, eating few food types.

oligosaline = 1) organisms able to live in brackish water.

oligosaline = 2) brackish water, water of intermediate salinity, 0.5-5.0 p.p.t. from land-derived salts.

oligothermic = tolerating or confined to relatively low temperatures.

oligotrophic = 1) adjective for oligotrophy.

oligotrophic = 2) an organism requiring only a small nutrient supply or a narrow range of nutrients.

oligotrophy = a lake condition with low productivity, hence the hypolimnion does not become depleted of oxygen. Usually having a deep, narrow basin and clear waters with little littoral vegetation.

oligotypic = a taxon with few members.

olim = formerly.

olivette = very small cylindrical, tear-drop or elongate diamond-shaped lead weights used on float rigs in angling. They are placed on the line beneath the float to ensure stability in fast, deep water. Held in place by shot or plastic pegs.

olympic-style fishing = a race-to-fish management system where individual boats race to take as much of the total allowable catch before the fishery closes.

omega eye = omega iris.

omega iris = a special iris structure found in armoured suckermouth catfishes (Loricariidae). The top part of the iris descends in a loop similar in shape to the Greek letter omega ( $\Omega$ ) in an upside down position. The loop can expand when light levels are high to cover the pupil centre forming a c-shaped light transmitting portion. It may also serve to break up the distinctive eye outline in a fish that is heavily camouflaged.

omega-3-fatty acid = long-chain polyunsaturated fatty acids (PUFAs) found in fishes. They have a beneficial effect on the human cardio-vascular system and reduce risks of cancer, diabetes, arthritis and autoimmune diseases. Docosahexaenoic acid, *q.v.*, and eicosapentaenoic acid, *q.v.*, are the principle acids.

omni- (prefix) = all, universally.

omnivore = feeder on both plants and animals.

omnivorous = eating both plants and animals.

omopterygia = plural of omopterygium.

omopterygium (plural omopterygia) = pectoral fin (the paired fin born by the pectoral girdle, usually just behind the gill opening or slightly dorsal or ventral to this position. Also called homopterygium. This fin is generally larger than the pelvic fin and less variable in position and structure. The pectoral is low on the body in more primitive bony fishes and higher in more advanced ones. It functions to steer, brake and propel the fish. Pectoral fin ray counts include all the rays branched and unbranched. The length is measured from the origin (upper or outer part of base) to the distal tip of the fin. Abbreviated as P or P1).

on the flake = spending the summer laying out cod to dry on the flakes (*q.v.*) (Newfoundland).

on your own hook = on your own, on your own responsibility. Derived from nineteenth century fishermen on the Grand Banks who were paid by what they caught on their own hooks and line.

on-demand feeder = aquaculture feeding systems where timing and quantity of food is determined by the fish, e.g. by pressing a lever.

on-station release = release of fish at a hatchery, *cf.* off-station release.

on-the-drop = angling with a float rig that sinks slowly in the water for catching fish high in the water column.

on-the-feed = fish feeding or looking for food.

onboard observer = a government official on board a vessel monitoring fishing and processing and collecting harvest data.

one of the finny tribe = a synonym for fish.

One Fish Two Fish Red Fish Blue Fish = a 1960 rhyming book for children by Dr. Seuss.

one-claw jigger = type of fishing-hook with a single barb, used without bait.

one-sea-winter salmon = a salmon, *Salmo salar*, which has spent one winter at sea (usually given as 1-sea-winter salmon); equivalent to a grilse, q.v., when maturing to spawn. There are also 2-sea-winter salmon, 3-sea-winter salmon, etc.

one-tub set = a single tub of line set out in trawl fishing.

ongrowing = raising fish to marketable size in aquaculture.

onomatography = the correct writing of animal and plant names.

onomatophore = a specimen acting as the name bearer; a nomenclatural type; type; nomenifer.

onomatotype = onomatotype.

onomatotype = a specimen which has been previously cited in print but which has not been used to illustrate anything not previously known about the morphology of the species or subspecies.

onshore = a direction landward from the sea, e.g. onshore wind, onshore current.

onshore waters = shallow waters at a small distance from the shore. Also called inshore or nearshore waters.

ontogenesis = the process of development from embryo to adult.

ontogenetic = adjective for ontogeny.

ontogeny = the development from embryo to adult.

oo- (prefix) = egg.

oocyte = oogonia become oocytes when meiosis begins and specialised cells surround each oocyte to form a follicle. The oocyte undergoes a maturation in preparation for spawning as an egg. The nucleus enlarges and its membrane becomes irregular, the cytoplasm becomes vacuolated, yolk is deposited and a zona radiata develops around the oocyte.

oodiniasis = infection with a dinoflagellate protozoan of the genus *Oodinium*, e.g. coral fish disease, q.v.

oogenesis = the formation and development of eggs.

oogonia = plural of oogonium.

oogonium (plural oogonia) = oogonia resemble undifferentiated germ cells in embryos. They undergo mitosis and proliferation to form oocytes; the process involves increase in cell and nucleus size.

oom = a slight sensation detected by a fisherman holding a line, indicating fish nibbling at the bait (Scottish dialect).

oophagy = 1) eating eggs.

oophagy = 2) a specialised mechanism for nourishing embryos where the embryos, while in the uterus or oviduct, feed on maternal eggs, e.g. in *Alopias pelagicus* (Alopiidae).

oothy = a smooth surface made on the sea by throwing out crushed limpets or mussels as inshore bait for coalfish (*Pollachius*, Gadidae) (Orkney dialect). Also spelled uthy.

ootype = an unofficial term in nomenclature for the type of an egg; an ovotype, e.g. presumably if only an egg case is known in fishes.

ooze = a muddy deposit of the deep ocean composed mostly of shells, foraminiferans and diatoms, or mud saturated with water.

oozing = fully ripe fish gonads where milt or eggs are leaking from the vent.

OP = 1) photophores just posterior to the end of the upper jaw in Myctophidae.

OP = 2) photophores on the gill cover, one near the anterior base of the preopercle, one in front of the anterior part of the subopercle, and one antero-dorsally to the operculum.

OP = 3) abbreviation for opercular canal.

*op. cit.* = abbreviation for *opera citato* or *opere citato*.

opaque zone = a dark zone in an otolith that, relative to other zones, restricts the passage of light. Under reflected light this zone appears bright.

open access equilibrium = when all of the excess profits or economic rent that attracts new entrants to a developing fishery have been dissipated in the costs associated with the additional fishing effort. The fishery is no longer attractive to new entrants. Usually occurs when fishing effort is higher than that which will obtain the greatest yield from a fishery.

open access fishery = fishery where there is no limit on the number of fishers. Usually refers to recreational fisheries. Frequently over-exploited and degraded.

open brooder = the condition in some Cichlidae that lay eggs on an open surface, such as rocks, sand, and plants. The eggs are usually numerous, small and clump together. Clear sexual

dimorphism and dichromatism is usually evident, e.g. *Pterophyllum*, *Sympysodon*, and most species of *Cichlasoma*.

open face spinning reel = a reel where the line is allowed to peel off the spool when a bale arm is turned aside. There is little or no friction as the reel does not turn as the line comes off.

open ice = ice covering five-tenths to eight-tenths of the water surface. Also called broken ice, loose ice, loose pack ice, open pack ice, slack ice.

open lake = a lake which has an outlet.

open pack ice = open ice.

open sea = the open part of a sea or ocean, extending outward from the continental shelf, usually outside territorial waters.

open season = the time period when angling is allowed for any given species, cf. closed season.

open substrate spawner = fish that broadcast large numbers of eggs and do not guard them.

open water = 1) freely navigable water where sea ice is less than 10%.

open water = 2) water away from land including the upper water layer of a lake.

open-end swimfeeder = a plastic swimfeeder (q.v.) without ends and often with holes in the sides allowing quick release of groundbait (q.v.).

open-mouthed skiff = a type of large, undecked fishing-boat.

opening = the scheduled beginning of a fishery that may last hours to months.

*opera citato* = in the publication (but not page) cited; used to avoid repetition of a reference in full.

*opera utique oppressa* = suppressed work (a work that the International Commission on Zoological Nomenclature has ruled to be unpublished or unavailable).

operational sex ratio = the ratio of males and females available to mate with one another. Not the same as the sex ratio.

operational unit = a group of vessels fishing in the same way for the same species.

opercle = the principle and largest, paired dermal bone comprising the upper part of the gill cover above the subopercle. Sometimes used in aging studies. Also called operculum, q.v.

opercula = plural of operculum.

opercular = pertaining to the operculum; often used for the opercle.

opercular canal = the cephalic lateral line canal (*q.v.*) on the opercle.

opercular flap = a postero-dorsal fleshy part of the gill cover, either composed solely of skin or also supported by an extension of the opercle. See also opercular lobe.

opercular head spine = a spine on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

opercular lobe = a postero-dorsal fleshy part of the gill cover, either composed solely of skin or also supported by an extension of the opercle. See also opercular flap.

opercular membrane = the tissue covering the gills laterally and enclosing (including in some, but not other definitions) the opercle, preopercle, subopercle and interopercle bones. In most Teleostei, where the membranes from each side meet under the head on the isthmus, the left side overlaps the right.

opercular opening = gill opening.

opercular photophore = one of a series of light organs located on the gill cover behind the end of the jaw in Myctophidae. Abbreviated OP.

opercular pumping = sucking or blowing water through the mouth by means of lifting the operculum to create a suction mechanism. Used by some fishes to aerate their eggs.

operculum (plural opercula) = the flap externally closing the gill chamber and usually supported in Teleostomi by the opercle, propercle, subopercle and interopercle; the gill cover. In some definitions, synonymous with the opercular membrane and with opercle.

*opere citato* = in the publication (but not page) cited; used to avoid repetition of a reference in full.

ophioblennius stage = a pelagic stage of some salariin Blenniidae characterised by enlarged pectoral fins, and enlarged, hooked teeth anteriorly in the lower jaw or in both jaws.

Opinion = a decision of the International Commission on Zoological Nomenclature applying, interpreting or suspending the provisions of the Code and stating what actions are to be taken, published in the Bulletin of Zoological Nomenclature.

opistho- (prefix) = behind, reversed or opposite.

opisthocœlian = opsithocoelous.

opisthocoelous = vertebral centra which are concave posteriorly and convex anteriorly. e.g. in Lepisosteidae.

opisthonephros = mesonephros (the functional organ of excretion in all adult fishes except Myxini. Arises in the middle portion of the body cavity but extends backwards to the entire length of body cavity. Has a large number of tubules).

opisthotic = a deep, endochondral bone forming the ventral element of the otic capsule, covering the ampulla of the posterior semicircular canal. Sometimes applied to the autopterotic. Present in fossil Crossopterygii and Actinopterygii, lost in *Amia*, *Lepisosteus* and modern Teleostei and therefore the name intercalar is more accurate for these fishes.

opisthure = 1) the tip of the vertebral column which protrudes beyond the caudal fin, e.g. in larval Elasmobranchii.

opisthure = 2) urostyle (1) the small upturned posterior tip of the vertebral column, generally formed of a slender, pointed rod of cartilage, or fused vertebrae and associated elements (in homocercal caudal fins of Teleostomi) and (2) the fan-like series of bones articulating with the last true vertebra, including preural centra, ural centra, epurals and hypurals. Counted as one vertebra in some vertebral counts, not counted in others.

opportunistic = taking advantage of unused or little used resources.

opportunistic feeding = feeding in which the fish is able to adapt to whatever food becomes available.

opportunistic fishing = where the fishing unit targets species and fishes in areas where fishing opportunities are greatest.

optic = 1) adjective regarding the eyes.

optic = 2) a type of artificial fly with an enlarged head and obvious eyes.

optic cup = a stage in eye development with an inner layer developing as the neural retina and an outer layer forming the pigmented retina.

optic lobe = one of the paired structures of the brain, *q.v.* forming the mesencephalon.

optic muscles = the arrangement of muscles that move the eye is variable in fishes. In *Perca flavescens*, for example, the muscles comprise the inferior, superior, lateral and medial recti muscles and the superior and inferior oblique muscles.

optic nerve = each optic nerve emerges from the anterior ventral corner of each optic lobe. The nerves cross over beneath the telencephalon.

optic pedicel = a cartilaginous rod projecting from the skull and supporting the eyeball in Elasmobranchii and Teleostei

optic primordium = the lateral outgrowth from the forebrain that becomes the eyeball, excluding the lens. It develops into the optic cup.

optic tectum = the dorsal roof of the mesencephalon concerned with vision.

optic ventricle = a cavity in the brain, one in each optic lobe.

optimum age = the average age of the fish in a year-class at which the instantaneous rate of natural mortality equals the instantaneous rate of growth in weight for the year-class as a whole. At this age, the biomass of the age class is maximum.

optimum fishing capacity = the balance between inputs and outputs, e.g. minimising costs while producing a sustainable harvest. Current or transient optimal capacity (related to current fleet and stock conditions) may differ from long run optimal capacity (reflecting management long-term objectives) particularly if the fishery resource is currently depleted and the management strategy is to rebuild this depleted resource.

optimum size = critical size (the average size of the fish in a year-class at the time when the instantaneous rate of natural mortality equals the instantaneous rate of growth in weight for the year-class as a whole). At this size, the biomass of the age class is maximum.

optimum sustainable yield = optimum yield.

optimum take = the annual catch from a stock which is economically viable, does not alter the ecosystem significantly and does not affect the reproductive potential of the stock.

optimum yield = the yield from a fishery which provides the greatest overall benefit to the nation with particular reference to food production, recreational opportunities and conservation or, allows rebuilding of overfished stocks. It is based on maximum sustainable yield (*q.v.*) as modified by economic, social or ecological factors. Generally catches are kept at less than the maximum sustainable yield as this keeps the biomass on the high side (and also it is not easy to assess what the maximum sustainable yield is). At this lower level there are more fish that are bigger, easier to catch and less expensive to do so, of better value, and easier to process. Note that the optimum may not be more big fish. It may be a longer season or many small fish as with sardines. The downside is fewer fishery jobs.

oral = pertaining to the mouth.

oral brooder = a fish which broods or protects the eggs (ovophile) or young (larvophile) by taking them into the mouth.

oral cavity = the shallow vestibule anterior to the pharynx, between the first row of gill rakers and the mouth.

oral disk = the circular mouth area of lampreys (*Petromyzontidae*) bearing horny teeth.

oral fimbria = one of a series of small tag-like appendages around the perimeter of the oral disc of lampreys (*Petromyzontiformes*), presumed to help create an effective seal when the lamprey is attached to its host and also probably sensory. Also called fringed processes, leaf-like processes, epithelial fringe, fringed lappets, leathery appendices and leathery appendages.

oral gestation = oral incubation.

oral grasping = a behaviour observed in members of the family Cyprinidae in laboratory flumes where the fish use the mouth to hold onto mesh screens as a station-holding method. Monocanthidae orally attach to sponges, tunicates, rope and fishing line in nature as a nocturnal mooring behaviour.

oral hood = a scoop-like structure formed by prolongation of the lips around the vestibule which leads to the mouth in Amphioxi and larval Petromyzontiformes.

oral jaw = the typical jaw of the mouth region as opposed to the internal jaw or pharyngeal teeth and associated structures.

oral incubation = mouth-breeding or the care and hatching of fertilized eggs in the mouth. Also called buccal incubation and, less aptly, oral gestation, e.g. certain Apogonidae, Ariidae, Anabantidae, Osteoglossidae.

oral papilla = one of a series of short, finger-like extensions of the skin immediately outside the oral fimbriae, *q.v.*, possibly of a sensory function.

oral plate = a band of tough connective tissue bearing teeth anterior and posterior to the oral opening in Petromyzontidae.

oral valve = the flap attached just inside the jaws which stop water escaping from the mouth during exhalation, helping to maintain a unidirectional flow. Usually a valve is found just inside the ring of teeth in the jaw. Posterior valves may also be present. Also called a buccal valve.

orange meat = a discolouration of the flesh of skipjack tuna occurring sometimes when brine-frozen and affecting marketability.

ORB = photophores near the eye; one antero-ventral to the eye is called the suborbital (or preorbital) and one postero-ventrally is called the postorbital. Sometimes spelled Orb.

orbicular = round, circular, nearly circular.

orbicular stadia or stage = a larval stage in some Acanthuridae where the body is almost spherical, translucent and covered with vertically elongated ridge-like serrated peduncular scales in distinct vertical rows. The first dorsal spine is the longest and stoutest spine and the rays become progressively shorter behind this.

orbit = the cavity in the skull enclosing the eye, the eye socket.

orbital = pertaining to the orbit.

orbital bones = the bones around the eye.

orbital diameter = either the greatest or the horizontal distance between the rims of the eye socket. Best measured as the greatest distance between the bony rims, or between the fleshy rims.

orbital fenestra = a centrally located opening in the head shield of some Placoderms for the eyes and nostrils.

orbital horn = a bony projection near the eye.

orbital region = the head around the eye comprising such dermal bones as the antorbital and infraorbitals (bearing a sensory canal) and the suborbitals and supraorbitals (without a canal).

orbitosphenoid = a deep, median or paired, endochondral bone underlying the frontal bone forming the floor and walls of the anterior end of the cranium. Visible in the wall of the orbit. Absent in Salmonidae and Gadidae, for example.

orbitostylic = a type of jaw suspension in which the upper jaw is attached to the braincase near the orbits, generally by a strong, but somewhat flexible soft tissue connection, e.g. in *Squalus acanthias*.

order = a taxonomic category above the family-group and below the class-group. The ordinal-group includes in ascending sequence the suborder, order and superorder. The International Code on Zoological Nomenclature does not consider the ordinal-group. In the Berg system, which uses the ending -iformes, the ordinal name is based on the family name of a well known family in the order.

ordinary cure = cod salted and dried in a manner intermediate between light and heavy salted grades.

ordinary high water mark = the usual and most common high water level found on a bank or bed. Above this point the soil has a distinct character and vegetation.

ordinary tide = not a technical term but equivalent to mean.

Ordovician = a geological period within the Palaeozoic ca. 504-441 million years ago. Abbreviated as O.

Oregon moist pellet = moist pellet (a pellet used in aquaculture with a moisture content around 30%. Composed of wet ingredients such items as minced fish, and dry ingredients such as fish meal, cereals, vitamins and minerals, with an alginate binder).

oreosoma = the distinctive young of the family Oreosomatidae characterised by scutes or horny protuberances in a leathery skin and thus unlike the adult.

organic bait = any organism or food used as bait in angling, e.g. worms, insects, fish eggs, minnows, cheese, bread, etc.

organism = any living entity.

organ, contact = contact organ (the dermal bony outgrowth or spicule projecting from a fin ray or scale margin and surrounded by the epidermis through which bony outgrowths may protrude. Present in those parts of the body and fins of the male which come in direct contact

with the female during the spawning act. May be tactile in function. Found in 9 families of 3 orders: Cypriniformes, Atheriniformes, and Scorpaeniformes (Wiley and Collette, 1970)).

organ, pearl = breeding tubercle (usually small, raised, epidermal structures on regions of the head, body, or fin rays where two individuals come in contact. May consist of aggregations of non-keratinized epidermal cells, the same with a light, superficial keratinized cuticle, or with substantial number of fully keratinized cells that are organized to form a discrete, usually conical cap. Breeding tubercles may function to maintain body contact between the sexes during spawning; in the defence of nests and territories; in the stimulation of females in courtship; and in some forms perhaps in sex and species recognition. Also called nuptial tubercles. Found in 15 families of 4 orders; Salmoniformes, Gonorynchiformes, Cypriniformes, and Perciformes (Wiley and Collette, 1970)).

organ of Fahrenholz = organs consisting of blind tubes that extend deep into the body in Dipneusti and Polypteriformes. In Polypteridae they are found only on the head and most commonly above the mouth. In the Dipneusti they are found over the whole body except the fins. The crypts are surrounded by a plexus of nerve fibres and are probably sensitive to electric stimuli.

organ of Pinkus = one of several diverticula in the spiracle of *Mustelus* and *Squalus*, or a dorsad running channel from the spiracle with three sensory organs at the end, or closed vesicles each with a sensory organ in *Protopterus* and *Lepidosiren*. The receptors can be considered as neuromasts but show similarities to the ampullae of Lorenzini. Their function is unknown.

organ of Sachs = the electric organ in the posterior part of the body in *Electrophorus*.

organic bait = any live or food bait, e.g. minnows, worms, cut bait, cheese, etc.

organic manure = manures added to fish ponds which, through decomposition by microorganisms, provides nutrients for plant growth. Farmyard faeces, urine, night soil, green manure, compost and silkworm dregs are all used.

organogenesis = a late stage of embryonic development where organ systems are formed.

organoleptic = pertaining to a sensory organ, usually taste, but can be smell. Often found in accounts of taste tests of fish preparations such as marinades.

organoleptic analysis = detecting off fish by smell.

oriental = eastern or easterly.

oriental cure = salted ungutted herring prepared in North America for trade to the Far East.

*orig.* = *originalis*.

origin (fin) = the anterior end of the base of a fin. Opposite of insertion.

origin (muscle) = the relatively fixed attachment of a muscle. Opposite of insertion.

original author = in nomenclature, the first author who used a published name or epithet.

original date = the date of publication of an available work containing a nomenclatural act, a name or a nominal taxon.

original description = the description of a taxon when first established.

original designation = the designation of the type of a taxon when first established.

original diagnosis = a formal statement of characters which distinguish a taxon from other similar or closely related taxa, published at the time of proposal of a new taxonomic name.

original fixation = the fixation of the type by original designation or by monotypy.

original material = all material used by an author in the preparation of the original description of a taxon. Includes specimens, illustrations and descriptions.

original publication = the work in which a name or nomenclatural act was first published.

original spelling = the spelling of an available name when first published. The original spelling of a name is to be kept as the 'correct original spelling' unless it does not meet the requirements of the International Code of Zoological Nomenclature. An incorrect original spelling is an original spelling that is incorrect. Multiple original spellings are two or more different original spellings for the same name.

*originalis* = original, used in nomenclature to indicate that a specimen is the original material, or part of it. Abbreviated as *orig.*.

originally included nominal species = said of a nominal genus-group taxon, the nominal species deemed to be originally included.

ornamental species = fish bred and reared in captivity for the aquarium trade.

ornamentation = frills, flaps, tags and other extensions of fins and the body of a fish used in concealing the body from predators or in reproductive behaviour.

ornatotype = an unofficial term in nomenclature for a topotype (a specimen collected at the type locality but not necessarily part of the type series).

orobranchial chamber = both the mouth and gill cavities. Sometimes defined as the gill cavity immediately adjacent to the mouth cavity. See also parabranchial chamber.

oronasal curtain = the internasal flap, a fleshy flap between the nostrils; in Chondrichthyes may cover part of the mouth.

oronasal groove = a groove leading from each nostril to the corresponding corner of the mouth in many Elasmobranchii.

ophopharynx = the section of the alimentary canal comprised of the oral and pharyngeal cavities.

oroshi hocho = in Japanese おろし包丁, meaning wholesale knife, a long (1.8 m including handle) and specialised knife used to fillet tuna and other large fishes. See also hancho hocho.

orphan collection = a scientific collection of fishes that has lost financial and curatorial support or that has been abandoned by the owner.

orphan virus = an orthomyxovirus-like agent isolated from bluegills (*Lepomis macrochirus*).

orphaned = said of an orphan collection.

*orth. mut.* = abbreviation for *orthographia mutata*.

ortho- (prefix) = straight, upright, at right angles.

orthodont = a type of tooth vascularisation in Chondrichthyes by means of an internal pulp cavity radiating into numerous tiny canals penetrating the orthodentine layer (Herman *et al.*, 1994), cf. osteodont.

*orthographia mutata* = with an altered spelling. Abbreviated as *orth. mut.*.

orthographic error = an unintentional misspelling. In nomenclature, later authors can correct the error without a change in author citation.

orthographic variants = 1) two or more different spellings of the same name.

orthographic variants = 2) names of two or more taxa with spellings so similar that they may be confused.

orthography = spelling or usage of words.

orthography conservation proposed = in nomenclature, a name proposed for conservation with a particular spelling.

orthography conserved = in nomenclature, a name conserved to preserve a particular spelling usually different from the original (which has not been much used or has been ignored).

orthotype = a type by original designation.

orthotypic = adjective for orthotype.

ory = fish with a smell or taste of seaweed (English dialect).

OS = old style.

os (plural ossa) = bone (the hard connective tissue consisting of cells (osteoblasts, osteocytes) in a mixture of collagen fibres and hardened by calcium and phosphate salts (calcium hydroxyapatite), serving to support the body. The cells are lost eventually leaving cavities and the bone is termed cellular, typical of Dipnoi, Crossopterygii, Chondrostei, primitive Teleostei, e.g. Cyprinidae, Siluridae, Salmonidae, Anguillidae, and some advanced Teleostei, e.g. *Perca*,

*Gadus*. Another form of bone is termed osteoid and lacks the ramifications seen in cellular bone. After the osteocytes disintegrate, the spaces they leave are filled with matrix and the bone is known as acellular, e.g. in *Cyclopterus*, *Mola*. Bone is strong and rigid in contrast to cartilage). Older works on fish anatomy may have bones listed in Latin, hence the following entries. Plural forms are given for those unfamiliar with Latin. Note that some bone and skeletal names in English are the same in English and Latin, e.g. branchiocranium, and the majority of English names are derived from the Latin name, merely having different word endings.

os actinostum (plural ossa actinosta) = actinost (one of a series of endochondral bones in the pectoral and pelvic girdle on which the fin rays insert. Most teleosts lack or have greatly reduced pelvic actinosts. Teleosts have one row of actinosts between the fin rays and supporting skeleton (coracoid and scapula for the pectoral, basipterygia for the pelvic) while other fishes may have more rows, referred to as radials).

os adnasale (plural ossa adnasalia) = adnasal (a small dermal bone in front of the nasal bone in some fishes, e.g. the middle bone of three in the nasal region of *Lepisosteus*).

os alisphenoidale (plural ossa alisphenoidalia) = alisphenoid (term misapplied in older literature to the pterosphenoid (*q.v.*) of fishes. It is not homologous with the alisphenoid of mammals and should not be used).

os angulare (plural ossa angularia) = angular (the triangular, paired dermal bone on the posterior ventral corner of the lower jaw. Also applied to the dermal bone of the lower jaw which articulates posteriorly with the quadrate, in which case the preceding bone is known as the retroarticular. In mammals this bone becomes the malleus of the inner ear).

os antorbitale (plural ossa antorbitalia) = antorbital (a small, paired dermal bone lying lateral to the nasal bone in front of the eye. Sometimes included in the suborbital or infraorbital series because the infraorbital canal crosses it, e.g. in Amiidae, Lepisosteidae, *Elops*, Osmeridae, some Siluridae).

os articulare (plural ossa articularia) = articular (the deep, endochondral bone of primitive acanthopterygians in the middle of the lower jaw between the dentary and the angular (or retroarticular) which articulates with the quadrate. It is later invaded by the angular. Divided into the distal part (wanting in Teleostomi) and the proximal part. Occupies the position of Bridge's ossicles *b* and *c* in *Amia*. Found as a distinct structure in *Amia*, *Lepisosteus*, *Polyodon* and *Acipenseridae*).

os auditorium (plural ossa auditoria) = one of the Weberian ossicles (the four bones in a chain derived from vertebrae in the Weberian apparatus forming the auditory unit or pars auditum (anterior to posterior): claustrum, scaphium, intercalarium and tripus).

os autopalatinum (plural ossa autopalatina) = autopalatine (a paired deep bone on the roof of the mouth, lateral to the prevomer (or vomer). Often called palatines. Usually overlain by the dermal, often tooth-bearing bone, the dermopalatine).

os autopteroticum (plural ossa autopterotica) = autopterotic or pterotic (the paired deep bone and the superficial dermal bone covering it forming the lateral roof of the skull between the parietal and the hyomandibular and in contact with the lateral semicircular canal).

os autosphenoticum (plural ossa autosphenotica) = autosphenotic (the deep bone comprising the postorbital process. Often called the sphenotic, it is overlain by the dermosphenotic or postorbital).

os basibranchiale (plural ossa basibranchialia) = basibranchial (one of the deep median bones at the base of the gill arches below the hypobranchials. May occur on arches 1, 2, 3, 4, the last being cartilaginous. The dermal plates bearing teeth and associated with the basibranchials are a separate structure. Each of the basibranchials may be called a copula and the first is named the basihyal).

os basihyale (plural ossa basihalia) = basihyal (the cartilage supporting the tongue at the anterior end of the hyal series in Elasmobranchii. It is the anteriormost median endochondral bone of the basibranchial series, joining both branches of the hyoid series and forming the tongue skeleton in Teleostei. Dorsally it may have a dermal tooth plate called the glossohyal. The basihyal does not always ossify, e.g. in Salmonidae).

os basioccipitale (plural ossa basioccipitalia) = basioccipital (the deep, median, endochondral bone at the posterior end of the parasphenoid on the ventral side of the posterior end of the skull. The bone with which the anterior-most vertebra articulates, it also forms the ventral part of the foramen magnum. In Cyprinidae it bears a posterior expansion forming the pharyngeal process).

os basipterygium (plural ossa basipterygia) = basipterygium (plural basipterygia)(one of the endochondral fused radials or pterygiophores at the base of a fin, particularly the pelvics. The two chondral basipterygia of the pelvic fin meet anteriorly at the pubic symphysis to form the pelvic girdle. The body of the bone is called the pubic plate and bears an acetabular facet for articulation of the fin rays or the radial bones. An anterior process is known as the pubic process, a middle as the iliac process and a posterior as the ischial process. Also called basalia or pelvic bone. It articulates with the antimere, q.v., the corresponding bone on the opposite side).

os basisphenoideum (plural ossa basipsphenoidea) = basisphenoid (the small, Y-shaped, deep, endochondral cranial bone ventrally covered by the parasphenoid and medial to the pterosphenoids forming part of the floor of the neurocranium and the base of the posterior myodome. The bone ossifies from the medial belophragm and two lateral meningosts that form the wings. It is cartilaginous in Ostariophysi and lost in, e.g., Gadidae).

os branchioperculum (plural ossa branchiopercula) = branchiopercle (a fourth bone of the opercular series in *Amia*, partially covered by the subopercle and interopercle, but regarded as the most dorsal branchiostegal ray by authors).

os branchiostegale (plural ossa branchiostegalia) = branchiostegal (one of the dermal bony (or cartilaginous) struts inserting on the epihyal and/or ceratohyal and sometimes the interhyal and hypohyal, and supporting the branchiostegal membranes. Of various forms from narrow, to

plate-like to hooked, with numbers varying according to phylogeny, up to 50 in Actinopterygii to none in Crossopterygii. Less preferably called branchiostegal rays because of confusion with the fin rays).

os circumorbitale (plural ossa circumorbitalia) = circumorbital (one of a series of superficial dermal bones encircling the eye including the suborbitals and supraorbitals. A complete circuit of bones is found only in such primitive fishes such as *Lepisosteus* and some Osteoglossidae).

os cleithrum (plural ossa cleithra) = cleithrum (plural cleithra)(the principal bow-shaped bone of the pectoral girdle, dermal in origin, forming the rear margin of the gill cavity. It articulates dorsally with the supracleithrum and ventrally with the scapula and coracoid, and meets its opposite pair medially under the heart. Used in age estimation, where it is more reliable than scales in some species, e.g. *Esox masquinongy*).

os coracoideum (plural ossa coracoidea) = coracoid (the lower, paired endochondral bone on which the pterygials or actinosts of the pectoral fin rest. Dorsally it has a notch which, with a similar ventral notch on the scapular, frames the scapular foramen. It attaches anteriorly to the cleithrum).

os coronomeckelium (plural ossa coronomeckelia) = coronomeckelian (a small bone on the postero-lateral part of Meckel's cartilage of the lower jaw. Often a point of insertion of the adductor mandibulae muscle. Also called sesamoid angular, supraangular, sesamoid articular, articular sesamoid, splenial, os meckeli or *d* bone).

os coxa (plural ossa coxae) = innominate bone (the pelvic fin bone in Gasterosteidae, sometimes a misnomer for the ectocoracoid. Also called pelvic bone, pelvic plate, posterior process, pubic bone and medial plate).

os dentale (plural ossa dentalia) = dentary (the anterior, paired, dermal bone in the lower jaw. Usually the only tooth-bearing bone in the mandible, the two halves have a V-shape and meet at the jaw tip or mandibular symphysis. Posteriorly it has a coronoid process directed dorsally and a ventral process bearing the mandibular sensory canal on its outer face).

os dermoarticulare (plural ossa dermoarticularia) = dermarticular (the dermal bone of the lower jaw laterally covering and often fusing with the angular or retroarticular).

os dermopalatinum (plural ossa dermopalatina) = dermopalatine (the paired dermal bone covering the undersurface of the autopalatines (*q.v.*) which are commonly called palatines, especially when the dermopalatine and autopalatine fuse).

os dermosphenoticum (plural ossa dermosphenotica) = dermosphenotic (a superficial dermal bone behind the eye comprising the sixth infraorbital or suborbital; the dermal representative of the autosphenotic. Bears part of the suborbital and sometimes the conjunction of temporal, and supra- and suborbital sensory canals).

os dermosupraoccipitale (plural ossa dermosupraoccipitalia) = dermosupraoccipital (the superficial, paired dermal bone covering the supraoccipital with which it may fuse. In many Teleostei it is a hinge for the skull articulation with the circumorbital ring. Siluridae have a

posterior toothed process that secures the nuchal disc. Also called parietooccipital, postparietal or dermal supraoccipital).

os ectocoracoideum (plural ossa ectocoracoidea) = ectocoracoid (a paired dermal bone in Gasterosteiformes connected with the coracoid and extending posteriorly. Has also been applied to the element below the scapula and applied to the coracoid in Dipnoi).

os ectopterygoideum (plural ossa ectopterygoidea) = ectopterygoid (a paired, deep, dermal bone forming part of the roof of the mouth, articulating anteriorly with the palatine, posteriorly with the quadrate and mesially with the endopterygoid if the latter is present. In *Amia* it has one or two rows of teeth. Sometimes called pterygoid when there is no endopterygoid).

os entoglossum = lingual plate (a dermal toothed bone covering and sometimes fusing with the basihyal, e.g. in Osteoglossidae. Also called glossohyal, dermentoglossum, os entoglossum, supralingual or basihyal dental plate).

os epihyale (plural ossa epihyalia) = epihyal (the deep, endochondral bone at the upper end of the hyoid arch below the interhyal. It joins the hyomandibular and the symplectic through the interhyal, and articulates with the ceratohyal by a suture in some fishes, e.g. Gadidae. May bear a dentigerous plate. Also called dorsal ceratohyal or posterohyal as it is considered to be the dorsal ossification of the ceratohyal. May or may not be homologous with the epal element of the branchial arches).

os epioccipitale (plural ossa epioccipitalia) = os epioticum.

os epioticum (plural ossa epiotica) = epiotic (the deep bone and the superficial bone overlying it which form the upper element of the otic capsule, and lie posterior to the parietal, ventral to the supraoccipital, and dorsal to the pterotic. It covers the posterior semicircular canal. It is considered to be an ossification of the occipital arch that has invaded the otic region and so is often called epioccipital).

os epurale (plural ossa epuralia) = epural (an elongate detached bone above the urostyle and behind the last neural spine supporting caudal fin rays. Apparently derived from neural spines or the urostylic centra; dorsal homologues of the hypurals. Vary in number between one in advanced fishes to three in primitive actinopterygians).

os ethmoidale (plural ossa ethmoidalia) = ethmoid (the deep, embryonic, perichondral, cartilaginous bone ossifying in and around the nasal septum. Later covered by the nasals, prevomer, adnasals (and rostrals) and located anterior to the orbit. It may not ossify in some Teleostei. Also called hypethmoid and dermethmoid).

os ethmoideum laterale (plural ossa ethmoidea lateralia) = parethmoid (a paired deep bone of perichondral origin lying in the front of the orbit under the prefrontal. Also called pleurethmoid, prefrontal, exethmoid and, incorrectly ectethmoid, as this latter is only in birds).

os frontale (plural ossa frontalia) = frontal (the superficial, paired dermal bone on top of the skull above the eyes, paired or fused into one. The frontals of fishes correspond to the parietals of Tetrapoda but frontal is retained on account of its long usage in fish osteology. These large

bones cover much of the neurocranium and may fuse with the lateral ethmoids and articulate with some of the circumorbital bones, the spehenotic and the pterotic. In the parietolateral skull type, the parietals are separated allowing the frontals to meet the supraoccipital).

os glossohyale (plural ossa glossohyalia) = glossohyal (the median dermal toothed bone at the anterior of the hyoid series. It covers dorsally the cartilaginous or bony basihyal. See lingual plate. Equivalent to the basihyal of Elasmobranchii).

os gulare (plural ossa gularia) = gular plate (the median or paired, dermal, flat bone(s) between the lower jaws of primitive Teleostomes, below the basibranchials. There is a median gular in Amiidae and some Elopidae, Megalopidae and Albulidae, in some Dipnoi there is a second, posterior median plate while others have two pairs of gulars lateral to the median plate, and in *Latimeria*, *Polypterus* and *Calamoichthys* there is a median plate and a lateral plate on each side. Presumably gulars are serially homologous with branchiostegal rays).

os gulare laterale (plural ossa gularia laterale) = lateral gular (a paired dermal bone of the basal throat region in, e.g. *Latimeria*).

os hypobranchiale (plural ossa hypobranchialia) = hypobranchial (one of a series of deep, paired endochondral bones on the lower part of the gill arch between the ceratobranchials and the basibranchials. May occur on arches 1, 2, 3, 4 and bear dentigerous plates. Salmonidae have only 3 pairs. In Chondrichthyes they are the most ventral paired cartilages, each called cartilago hypobranchialis).

os hypohyale (plural ossa hypohylia) = hypohyal (the one or two deep, endochondral bones in the hyoid arch between the ceratohyal and the glossohyal. Articulates dorsally with the ceratohyal and ventrally with the basihyal. *Lepisosteus* has only one while *Gadus* has two, the dorsal hypohyal or dorsohyal and the ventral hypohyal or ventrohyal).

os hypurale (plural ossa hypuralia) = hypural (one of the flattened, fused bony haemal spines fanning out at the base of the caudal fin and bearing caudal rays. *Amia* has 10 hypurals, *Salmo* 7 but in most teleosts the number is reduced or fused into a single structure, the urostyle, q.v.).

os infraorbitale (plural ossa infraorbitalia) = infraorbital bone (one of a series of dermal bones generally below the eye. Name applied to the first six circumorbital bones: infraorbital 1 (lachrymal or preorbital), infraorbital 2 (jugal), infraorbital 3 (true postorbital), infraorbitals 4 and 5, and infraorbital 6 (dermosphenotic). Associated with the infraorbital lateral line. Suborbital bones, q.v., are recognised by some authors as a separate series, sometimes used as a synonym for infraorbital).

os innominatum (plural ossa innominata) = innominate bone (the pelvic fin bone in Gasterosteidae, sometimes a misnomer for the ectocoracoid. Also called pelvic bone, pelvic plate, posterior process, pubic bone and medial plate).

os intercalare (plural ossa intercalaria) = intercalar (a separate sesamoid bone, forming the posterior wall of the otic or auditory capsule, between the prootic, pterotic and the exoccipital and associated with the ventral process of the posttemporal. Also called opisthotic, q.v. and

sometimes applied to the autopterotic. Absent in Siluridae and with a foramen for the glossopharyngeal nerve in Gadidae).

os interhyale (plural ossa interhyalia) = interhyal (the deep, endochondral bone between the hyomandibular and symplectic bone and above the epihyal in the hyoid arch. Absent in Dipnoi. Also called stylohyal but not homologous with the stylohyal of Tetrapoda).

os intermusculare (plural ossa intermuscularia) = intermuscular bone (a rib bone lying in the horizontal septum between the epaxial and hypaxial muscles or in the myocommata of the epaxials. See also myorhabdoi, epineurals, dorsal ribs).

os interoperculare (plural ossa interopercularia) = os interoperculum.

os interoperculum (plural ossa interopercula) = interopercle (the paired dermal bone of the lower gill cover below the horizontal arm of the preopercle and in front of the subopercle. Connected to the mandible by a ligament. Absent in *Lepisosteus* and Siluridae).

os investientium (plural ossa investientia) = membrane bone (a bone which arises directly from connective tissue membranes without cartilaginous precursors. Includes dermal bones, as opposed to cartilage ones. Membrane bones are thin, laminar and located near the surface of the body. When the connective mesenchyme transforms into bone it does not differ histologically from bone which arose from cartilage. Also called achondral, dermal (q.v.), covering and investing bone).

os jugale (plural ossa jugalia) = jugal (a dermal bone below the eye, the second in the circumorbital series, to which the adductor maxillaris muscle attaches its mesial surface. Also used by some authors for the supramaxilla, q.v. and the first suborbital bone or lachrymal, q.v.).

os jugostegale (plural ossa jugostegal) = jugostegalia (the name given to the numerous rib-like osseous supports in the outer ventral walls behind the branchiostegals of the branchial chamber of the eel, *Myrophis*. Not regarded as homologous with branchiostegals and considered as structural supports of the prolonged branchial cavity. Other authors regarded them as homologous, defining them as those secondary, multiplied, overlapping and free (from the hyoid arch) branchiostegals found in certain anguilliforms. The term accessory branchiostegal rays is preferred by some authors to jugostegalia, although uncertain as to their homology. Characteristic of the anguilliform families Echelidae, Ophichthidae and Neenchelyidae. Also called jugostegal rays).

os lacrimale (plural ossa lacrimalia) = lachrymal (the first, paired, dermal bone in the circumorbital series, the largest. Also called preorbital and also spelled lachrimal, lacrimal).

os lacrimojugale (plural ossa lacrimojugalia) = lacrimojugal (a paired dermal bone formed from the fusion of the first two infraorbitals, e.g. in *Latimeria* and Homalopteridae).

os linguale plattum (plural ossa lingualia plattum) = lingual plate (a dermal toothed bone covering and sometimes fusing with the basihyal, e.g. in Osteoglossidae. Also called glossohyal, dermentoglossum, supralingual or basihyal dental plate).

os maxillare (plural ossa maxillaria) = maxilla (plural maxillae)(the dermal bone forming part of the upper jaw, displaced inwards by the premaxilla in more modern Teleostei. It may bear teeth. Also called maxillary which is also the adjective).

os meckelium (plural ossa meckelia) = coronomeckelian (a small bone on the postero-lateral part of Meckel's cartilage of the lower jaw. Often a point of insertion of the adductor mandibulae muscle. Also called sesamoid angular, supraangular, sesamoid articular, articular sesamoid, splenial, or *d* bone).

os mentomeckelium (plural ossa mentomeckelia) = mentomeckelian (the ossified tip of Meckel's cartilage. It fuses with the dentary in most Teleostei but is independent in Cyprinidae. Found in *Amia* and perhaps larval Salmonidae. Also called mentomandibular).

os mesethmoideum (plural ossa mesethmoidea) = mesethmoid (a term misapplied to the ethmoid (*q.v.*); the fish structure is not homologous with that in mammals).

os mesocoracoideum (plural ossa mesocoracoidea) = mesocoracoid (a paired pectoral girdle endochondral bone between the cleithrum dorsally and the coracoid and scapula ventrally).

os mesopterygoideum (plural ossa mesopterygoidea) = mesopterygoid (endopterygoid (a deep, paired bone on the roof of the mouth lying behind the pterygoid)).

os metapterygoideum (plural ossa metapterygoidea) = metapterygoid (the deep, paired, endochondral bone forming the posterior end of the palatoquadrate and connected with the hyomandibular. Absent in many modern Teleostei, it bears teeth in the Albulidae. Also called mesopterygoid, endopterygoid and entopterygoid).

os nasale (plural ossa nasalia) = nasal bone (a paired dermal bone occurring between the premaxilla and the prefrontal, antorbital or lachrymal on either side of the snout and usually enclosing the nares. *Lepisosteus* has three nasals, prenasal or rostral, adnasal or nasal and premaxillo-nasal or antorbital).

os operculare (plural ossa opercularia) = opercle (the principle and largest, paired dermal bone comprising the upper part of the gill cover above the subopercle. Sometimes used in aging studies).

os operculum (plural ossa opercula) = opercle (the principle and largest, paired dermal bone comprising the upper part of the gill cover above the subopercle. Sometimes used in aging studies).

os opisthoticum (plural ossa opisthotica) = opisthotic (a deep, endochondral bone forming the ventral element of the otic capsule, covering the ampulla of the posterior semicircular canal. Sometimes applied to the autoptotic. Present in fossil Crossopterygii and Actinopterygii, lost in *Amia*, *Lepisosteus* and modern Teleostei and therefore the name intercalar is more accurate for these fishes).

os orbitosphenoideum (plural ossa orbitosphenoidea) = orbitosphenoid (a deep, median or paired, endochondral bone underlying the frontal bone forming the floor and walls of the

anterior end of the cranium. Visible in the wall of the orbit. Absent in Salmonidae and Gadidae, for example).

os palatinum (plural ossa palatina) = palatine (a paired, endochondral bone on the roof of the mouth lateral to the (pre) vomer. Properly called the autopalatine since it has a double nature, being covered ventrally by the dermal dermopalatine, which is often dentigerous. The palatine is cartilaginous in *Lepisosteus* and in *Amia* the dermopalatine is independent, not fused to the autopalatine).

os parasphenoideum (plural ossa parasphenoidea) = parasphenoid (the median dermal bone extending along the base of the cranium, posterior to the prevomer (or vomer). May bear teeth, e.g. in *Amia*, or molariform teeth, e.g. in Albulidae).

os parietale (plural ossa parietalia) = parietal (a dermal paired bone on each side of the top rear of the head over the auditory region, behind the frontals and partly or wholly separated by the supraoccipital. In *Amia* and Elopidae both parietals meet in the midline and separate the frontals and the supraoccipital, forming a type of skull called medioparietal. In contrast, a lateroparietal skull has the frontals and supraoccipital meeting in the midline, separating the parietals, e.g. in Gadidae. In an aparietal skull, the parietals are absent, e.g. in Syngnathiformes, Siluridae).

os parietooccipitale (plural ossa parietooccipitalia) = parietoccipital (dermosupraoccipital (the superficial, paired dermal bone covering the supraoccipital with which it may fuse. In many Teleostei it is a hinge for the skull articulation with the circumorbital ring. Siluridae have a posterior toothed process that secures the nuchal disc. Also called postparietal or dermal supraoccipital).

os pharyngeum inferior (plural ossa pharyngea inferiora) = lower pharyngeal bone (the fifth ceratobranchial, especially that in Cyprinidae and relatives, which is strengthened and tooth-bearing. Also called infrapharyngobranchial dental plate).

os pharyngobranchiale (plural ossa pharyngobranchialia) = pharyngobranchial (the deep, endochondral bone at the top of the gill arch. May bear the upper pharyngeal and a dentigerous plate. May occur on arches 1, 2, 3, 4. Also called super-pharyngeals or superior pharyngeals. Suprapharyngobranchials are never associated with teeth while infrapharyngobranchials may be associated with dermal plates bearing teeth).

os pleurosphenoideum (plural ossa pleurosphenoidea) = pleuroosphenoïd (misnomer for pterosphenoid, q.v., since it is not homologous with the reptilian pleuroosphenoïd).

os postcleithrum (plural ossa postcleithra) = postcleithrum (a dermal bone of the pectoral girdle posteroverentral to the cleithrum which supports it dorsally. There may be one to several postcleithra (absent in some species). Also called metacleithrum and postclavicle).

os postorbitale (plural ossa postorbitalia) = postorbital (behind the orbit or eye; a bone in the series behind the eye, part of the infraorbital series. They are SO<sub>3</sub>, SO<sub>4</sub>, SO<sub>5</sub> and SO<sub>6</sub> or IO<sub>3</sub>.....IO<sub>6</sub>. IO<sub>6</sub> is also called the dermosphenotic, q.v.).

**os posttemporale** (plural *ossa posttemporalia*) = posttemporal (the superficial, Y-shaped dermal bone connecting the pectoral girdle with the skull, namely the epiotic or supraoccipital (upper part of the bone) and the opisthotic (in primitive fishes) or the intercalar (in modern fishes)(lower part of the bone). Traversed by the posttemporal lateral line canal. Also called suprascapula, suprascapular, supracleithrum I and supraclavicle I).

**os præarticulare** (plural *ossa præarticularia*) = prearticular (1) the paired dermal bone of the lower jaw covering the articular mesially, bearing teeth and having a well-developed coronoid process, (2) coronoid (a paired dermal bone bearing teeth located on the upper edge of Meckel's cartilage. One pair is found in Acipenseridae and two pairs in *Amia* and *Lepisosteus*. Also called presplenial, splenial and intradentary)).

**os præethmoideum** (plural *ossa præethmoidea*) = pre-ethmoid (one of the paired deep bones lying above the vomer in *Amia* and *Esox*. Similar bones occur in Catostomidae and Cyprinidae. Formerly called septomaxilla but not homologous with that bone in tetrapods).

**os præfrontale** (plural *ossa præfrontalia*) = prefrontal (a superficial, paired, dermal bone lying in front of the eye between the lacrymal and first supraorbital and covering and fusing with the parethmoid; a term often used for the lateral ethmoid or a portion of the lateral ethmoid of dermal origin).

**os præmaxilla** (plural *ossa præmaxillæ*) = premaxilla (one of the paired, superficial, usually toothed, dermal bones of the upper jaw, proximal or anterior to the maxillaries; in primitive Teleostomi they comprise the middle, in more advanced forms they may comprise the whole, of the oral edge of the upper jaw. Teeth may be present. In Diodontidae, the premaxillæ are ankylosed and form a single bone. Absent in Chondrostei. In Holostei (*Lepisosteus* and *Amia*) the bone has two ossification centres and therefore is a double bone. Holostei and Teleostei have an ascending process anteriorly but these may not be homologous. Posterior to the ascending process in Teleostei there may be an articular and a postmaxillary process, and a posterior extension, the caudal process. Also called premaxillary, surmaxillary, bimaxillary or intermaxillary).

**os prænasale** (plural *ossa prænasalia*) = prenasal (an anterior dermal bone near the snout tip, bearing a sensory canal. Also called rostral).

**os præoperculum** (plural *ossa præopercula*) = preopercle (the L-shaped dermal bone which lies in front of the gill cover and which bears the upper part of the preoperculo-mandibular lateral line canal. It may bear spines or fine teeth. It belongs to the suspensorium rather than the opercular series and acts to prevent the suspensorium from moving laterally).

**os præorbitale** (plural *ossa præorbitalia*) = preorbital (the usually large bone lying anterior and slightly ventral to the eye. Also known as the lachrymal or first suborbital. The preorbital is the first of the circumorbital series. In *Lepisosteus* comprises 6-8 ossicles, joined by teeth and forming the border of the upper jaw. Also refers to the area anterior to or below the eye).

**os prævomere** (plural *ossa prævomeria*) = prevomer (a frequently toothed median or paired dermal bone in the middle of the roof of the mouth covering the ethmoid ventrally and in front

of the parasphenoid. Often incorrectly called vomer, but this bone in mammals is not homologous with the bone in fishes).

os priapium (plural ossa priapia) = the bones of the priapium, *q.v.*

os proethmoideum (plural ossa proethmoidea) = proethmoid (one of the paired dermal bones resting behind on the frontals and in front on the cartilage above the prevomer, e.g. in *Esocoidei*).

os prooticum (plural ossa prootica) = prootic (the anterior, deep dermal bone of the otic capsule. In *Amia* it is the only bone of the otic capsule).

os pterosphenoideum (plural ossa pterosphenoidea) = pterosphenoid (the paired, deep, endochondral bone roofing the skull lying under the frontal, and posterior to the orbitosphenoid. Mislabelled alisphenoid and pleurosphenoid but these bones in mammals and reptiles respectively are not homologous).

os pteroticum (plural ossa pterotica) = pterotic (the paired, deep, endochondral bone and the superficial dermal bone covering it in Actinopterygii forming the lateral roof of the skull between the parietal and the hyomandibular, covering the ampulla of the horizontal semicircular canal. Also called autopteryotic, which is strictly used for the endochondral element. In *Amia* it is a paired dermal bone carrying a sensory canal and occupying the dorsal side of the otic capsule. Also called squamosal or squamous but this tetrapod bone is not homologous (but see squamosal)).

os pterygoideum (plural ossa pterygoidea) = pterygoid (a paired dermal bone between the autopalatine and the endopterygoid in the roof of the mouth (of the palatoquadrate). See also ectopterygoid).

os quadrato-jugale (plural ossa quadrato-jugalia) = quadratojugal (a paired dermal bone behind the quadrate, e.g. in *Lepisosteus* and *Acipenseridae*. It may be an independent ossification, e.g. in *Salmo* and *Syngnathus*. Sometimes called interopercle or preopercle from its position).

os quadratum (plural ossa quadrata) = quadrate (a paired, triangular, deep, endochondral bone on which the mandible hinges, connecting the lower jaw to the palatine and hyoid arches. During evolution becomes the incus bone of the inner ear of mammals).

os radiiferum (plural ossa radiifera) = axonost or pterygiophore (the cartilage or bone on the outer end of which sit the median fin rays or spines, sometimes the proximal pterygiophore).

os radiale (plural ossa radialis) = radial (a bony or cartilaginous support for a fin ray or spine. Usually three - the proximal, middle and distal radials. If the proximal radial is notably larger it is spoken of as a basal. Teleosts have only one row of radials between the fin rays and the supporting skeleton and these are called actinosts. More primitive fishes have more, e.g. *Polyodon* has 13, *Acipenser* has 9).

os retroarticulare (plural ossa retroarticularia) = retroarticular (the triangular, endochondral, dermal or mixed origin bone on the back, hind corner of the lower jaw. Often called the angular, Bridge's ossicle *a*, lower articular or angulo-retroarticular).

os rostrale (plural ossa rostralia) = rostral bone (the paired superficial dermal bone covering the ethmoid anterior to the eye in Holostei).

os scapulum (plural ossa scapula) = scapula (the upper, paired endochondral bone on which the pterygials, actinosts or radials of the pectoral fin rest. It articulates ventrally with the coracoid an anteriorly with the cleithrum. A notch on the lower edge of the scapula matches a similar notch on the coracoid to frame the scapular foramen).

os sclerotiale (plural ossa scleroticalia) = sclerotic bone (one of a series of bones in the sclera of the eye, e.g. in *Salmo* there are anterior and posterior sclerotic bones, in *Gasterosteus* dorsal and posterior, and in *Xiphias* the entire sclera ossifies with two openings, one for the cornea and one for the optic nerve).

os sphenoticum (plural ossa sphenotica) = sphenotic (a deep bone below the frontal, above the pterosphenoid (or alisphenoid) and under the dermosphenotic. Also called autosphenotic).

os spleniale (plural ossa splenalia) = splenial (a dermal bone carrying a sensory canal, e.g. in *Amia*. Also called sesamoid angular or submandibular).

os squamosum (plural ossa squamosa) = squamosal (a paired endochondral bone found in *Latimeria* but incorporated in the preopercle of modern Actinopterygii. Also a term misapplied to the pterotic in fishes).

os suboperculare (plural ossa subopercularia) = subopercle (the paired dermal bone lying below the opercle in the gill cover. Also called subopercular and suboperculum).

os suboperculum (plural ossa subopercula) = subopercle (the paired dermal bone lying below the opercle in the gill cover. Also called subopercular and suboperculum).

os suborbitale (plural ossa suborbitalia) = suborbital (below the eye. Name applied to the first six circumorbital bones: suborbital 1 (lachrymal or preorbital), suborbital 2 (jugal), suborbital 3 (true postorbital), suborbitals 4 and 5, and suborbital 6 (dermosphenotic). Also called infraorbital bones. Associated with the infraorbital lateral line. Sometimes reserved for a chain of small bones below the infraorbitals and unrelated to the infraorbital sensory canal, e.g. in palaeoniscoids, usually absent in advanced fishes).

os supraangulare (plural ossa supraangularia) = supraangular (coronomeckelian (a small bone on the postero-lateral part of Meckel's cartilage of the lower jaw. Often a point of insertion of the adductor mandibulae muscle. Also called sesamoid angular, sesamoid articular, articular sesamoid, splenial, os meckeli or *d* bone)).

os supracleithrum (plural ossa supracleithra) = supracleithrum (the paired dermal bone of the secondary pectoral girdle above the cleithrum and below the posttemporal. Also called hypercleithrum).

os supraethmoideum (plural ossa supraethmoidea) = supraethmoid (one of the paired dermal bones above the ethmoid, anterior to the frontals. Also called dermethmoid, dermal ethmoid, mesethmoid, dermal mesethmoid rostral).

os supramaxillare (plural ossa supramaxillaria) = supramaxilla (the dermal bone(s) on the upper side of the posterior end of the maxilla. Salmonidae have one supramaxilla while Sternopychidae have two. Lost in more advanced Teleostei. Also called supramaxillary, surmaxilla, surmaxillary, malar and jugal).

os supraoccipitale (plural ossa supraoccipitalia) = supraoccipital (a median, mixed-origin bone at the upper rear end of the cranium, often bearing a crest, and forming the upper edge of the foramen magnum. In most bony fishes its origins are from the ossification of the otic roof (tectum synoticum) and the connective median septum separating the anterior trunk muscles. Absent in Chondrostei and Holostei).

os supraorbitale (plural ossa supraorbitalia) = supraorbital bone (one of the 1-3 dermal bones of the circumorbital series forming, when present, the dorsal margin of the orbit and lacking sensory canals. The fossil Pholidophoridae had 3 supraorbitals, many modern fishes have 1 or 2, *Amia* and more advanced Teleostei have none).

os suprapharyngobranchiale (plural ossa suprapharyngobranchialia) = suprapharyngobranchial (pharyngobranchial (the deep, endochondral bone at the top of the gill arch. May bear the upper pharyngeal and a dentigerous plate. May occur on arches 1, 2, 3, 4. Also called superpharyngeals or superior pharyngeals. Suprapharyngobranchials are never associated with teeth while infrapharyngobranchials may be associated with dermal plates bearing teeth)).

os suprapræoperculum (plural ossa suprapræopercula) = suprapreopercle (a small, paired dermal tube bone carrying the lateral line canal across the gap between the preopercle and supratemporal, often absent. Also called supratemporal, subtemporal and suprapreoperculum).

os suspensorium (plural ossa suspensoria) = a suspensory bone of the Weberian apparatus, q.v., being a modified fourth rib and parapophysis supporting the anterior gas bladder and dorsal mesentery.

os symplecticum (plural ossa sympectica) = symplectic (the small, paired, deep, endochondral bone joining the quadrate and the hyomandibular and supporting the interhyal in the hyostylic jaw (q.v.). It is cartilaginous in *Acipenser* and absent in Siluroidei and Anguilloidei).

os tabulare (plural ossa tabularia) = tabular bone (extrascapula (a small bone bordering the posterior margin of the skull roof in primitive Teleostomi. These bones apparently originate from enlarged scales. One of a series of from 2-8 bones known variously as cervicals, nuchals, postparietals, scale bones or supratemporals. Often small and thin dermal bones on the nape or above the opercular membrane related to the supratemporal sensory canal)).

os urodermale (plural ossa urodermalia) = urodermal (paired, thin dermal bones at the rear of the caudal fin skeleton, derived from scales).

os urohyale (plural ossa urohyalia) = urohyal (a flat, median, deep, endochondral bone below the ceratohyal; a tendon bone arising in the septum between the longitudinal muscles of the isthmus. Absent in such primitive fishes as *Lepisosteus*. Also called clidost, episternal, interclavicle and parahyoid).

os uroneurale (plural ossa uroneuralia) = uroneural (one of the paired, elongate, endochondral bones projecting from the lateral surfaces of the urostyle).

os vomere (plural ossa vomeria) = vomer (prevomer, a frequently toothed median or paired dermal bone in the middle of the roof of the mouth covering the ethmoid ventrally and in front of the parasphenoid. Incorrectly called vomer).

oscillatory swimming = use of the paired fins, pectorals and pelvics, to generate highly manoeuvrable movement. See also undulatory swimming.

osel = ossil.

O'Shaugnessy hook = a hook with the point bent slightly outward, similar to the sproat and Limerick.

osmoregulation = maintenance of a proper balance of salts and water within an organism. Freshwater fish regulate hyperosmotically as they tend to lose salts and take up water. They have a glomerular kidney which secretes very dilute urine (up to 20% of body weight each day), kidney tubules are impermeable to water, sodium ions are actively pumped from the distal kidney tubules and across membranes of chloride cells (*q.v.*) in the gills while chloride ions passively follow the gradient established, and the sodium and potassium pump across the gills involves an exchange of ammonium ions for sodium or potassium ions so ammonia is eliminated while salts are gained. Marine fish regulate hypo-osmotically as they tend to gain salts and lose water. They have an aglomerular kidney which produces very little urine while secreting magnesium and sulphate ions, seawater is drunk copiously (up to 12% of body weight per day), sodium ions are actively pumped from the gut to body fluids and chlorine ions and water follow passively, the gut is relatively impermeable to magnesium and sulphate ions, the chloride cells actively secrete sodium and chlorine ions follow, and the gill membranes are relatively impermeable to water. Sharks use urea to maintain internal osmotic levels above sea water while excess salt from food is excreted via a rectal gland, (*q.v.*). Fish living in euryhaline waters have a glomerular kidney that can be shut down by arteriole constriction and chloride cells that can switch between taking up salt and secreting it. Based on [www.csuchico.edu/~pmaslin/ichthy/xcrtn.html](http://www.csuchico.edu/~pmaslin/ichthy/xcrtn.html), downloaded 29 December 2003.

ossa = plural of os.

ossa actinosta = plural of os actinostum.

ossa adnasalia = plural of os adnasale.

ossa alisphenoidalia = plural of os alisphenoidale.

ossa angularia = plural of os angulare.

ossa antorbitalia = plural of os antorbitale.

ossa articularia = plural of os articulare.

ossa auditoria = plural of os auditorium.

ossa autopalatina = plural of os autopalatinum.

ossa autopterotica = plural of os autopteroticum.

ossa autosphenotica = plural of os autosphenoticum.

ossa basibranchialia = plural of os basibranchiale.

ossa basihyalia = plural of os basihyale.

ossa basioccipitalia = plural of os basioccipitale.

ossa basipterygia = plural of os basipterygium.

ossa basipsphenoidea = plural of os basisphenoideum.

ossa branchiopercula = plural of os branchioperculum.

ossa branchiostegalria = plural of os branchiostegale.

ossa circumorbitalia = plural of os circumorbitale.

ossa cleithra = plural of os cleithrum.

ossa coracoidea = plural of os coracoideum.

ossa coronomeckelia = plural of os coronomeckelium.

ossa coxae = plural of os coxa.

ossa dentalia = plural of os dentale.

ossa dermoarticularia = plural of os dermoarticulare.

ossa dermopalatina = plural of os dermopalatinum.

ossa dermosphenotica = plural of os dermosphenoticum.

ossa dermosupraoccipitalia = plural of os dermosupraoccipitale.

ossa ectocoracoidea = plural of os ectocoracoideum.

ossa ectopterygoidea = plural of os ectopterygoideum.

ossa epihyalia = plural of os epihyale.

ossa epioccipitalia = plural of os epiocciptale.

ossa epiotica = plural of os epioticum.

ossa epuralia = plural of os epurale.

ossa ethmoidalia = plural of os ethmoidale.

ossa ethmoidea lateralia = plural of os ethmoideum laterale.

ossa frontalia = plural of os frontale.

ossa glossohyalia = plural of os glossohyale.

ossa gularia = plural of os gulare.

ossa gularia laterale = plural of os gulare laterale.

ossa hypobranchialia = plural of os hypobranchiale.

ossa hypohyalia = plural of os hypohyale.

ossa hypuralia = plural of os hypurale.

ossa infraorbitalia = plural of os infraorbitale.

ossa innominata = plural of os innominatum.

ossa intercalaria = plural of os intercalare.

ossa interhyalia = plural of os interhyale.

ossa intermuscularia = plural of os intermusculare.

ossa interopercularia = plural of os interoperculare.

ossa interopercula = plural of os interoperculum.

ossa investientia = plural of os investientium.

ossa jugalia = plural of os jugale.

ossa jugostegalia = plural of os jugostegale.

ossa lacrimalia = plural of os lacrimale.

ossa lacrimojugalia = plural of os lacrimojugale.

ossa lingualia plattum = plural of os linguale plattum.

ossa maxillaria = plural of os maxillare.

ossa meckelia = plural of os meckelium.

ossa mentomeckelia = plural of os mentomeckelium.

ossa mesethmoidea = plural of os mesethmoideum.

ossa mesocoracoidea = plural of os mesocoracoideum.

ossa mesopterygoidea = plural of os mesopterygoideum.

ossa metapterygoidea = plural of os metapterygoideum.

ossa nasalia = plural of os nasale.

ossa opercularia = plural of os operculare.

ossa opercula = plural of os operculum.

ossa opisthotica = plural of os opisthoticum.

ossa orbitosphenoidea = plural of os orbitosphenoideum.

ossa palatina = plural of os palatinum.

ossa parasphenoidea = plural of os parasphenoideum.

ossa parietalia = plural of os parietale.

ossa parietooccipitalia = plural of os parietooccipitale.

ossa pharyngea inferiora = plural of os pharyngeum inferior.

ossa pharyngobranchialia = plural of os pharyngobranchiale.

ossa pleurosphenoidea = plural of os pleurosphenoideum.

ossa postcleithra = plural of os postcleithrum.

ossa postorbitalia = plural of os postorbitale.

ossa posttemporalia = plural of os posttemporale.

ossa præarticularia = plural of os præarticulare.

ossa præethmoidea = plural of os præethmoideum.

ossa præfrontalia = plural of os præfrontale.

ossa præmaxillæ = plural of os præmaxilla.

ossa prænasalia = plural of os prænasale.

ossa præopercula = plural of os præoperculum.

ossa præorbitalia = plural of os præorbitale.

ossa prævomeria = plural of os prævomere.

ossa priapia = plural of os priapum.

ossa proethmoidea = plural of os proethmoideum.

ossa prootica = plural of os prooticum.

ossa pterosphenoidea = plural of os pterosphenoideum.

ossa pterotica = plural of os pteroticum.

ossa pterygoidea = plural of os pterygoideum.

ossa quadrato-jugalia = plural of os quadrato-jugale.

ossa quadrata = plural of os quadratum.

ossa radiifera = plural of os radiiferum.

ossa radialia = plural of os radiale.

ossa retroarticularia = plural of os retroarticulare.

ossa rostralia = plural of os rostrale.

ossa scapula = plural of os scapulum.

ossa scleroticalia = plural of os scleroticale.

ossa sphenotica = plural of os sphenoticum.

ossa splenalia = plural of os spleniale.

ossa squamosa = plural of os squamosum.

ossa subopercularia = plural of os suboperculare.

ossa subopercula = plural of os suboperculum.

ossa suborbitalia = plural of os suborbitale.

ossa supraangularia = plural of os supraangulare.

ossa supracleithra = plural of os supracleithrum.

ossa supraethmoidea = plural of os supraethmoideum.

ossa supramaxillaria = plural of os supramaxillare.

ossa supraoccipitalia = plural of os supraoccipitale.

ossa supraorbitalia = plural of os supraorbitale.

ossa suprapharyngobranchialia = plural of os suprapharyngobranchiale.

ossa suprapræopercula = plural of os suprapræoperculum.

ossa suspensoria = plural of os suspensorium.

ossa symplectica = plural of os symplecticum.

ossa tabularia = plural of os tabulare.

ossa urodermalia = plural of os urodermale.

ossa urohyalia = plural of os urohyale.

ossa uroneuralia = plural of os uroneurale.

ossa vomeria = plural of os vomere.

ossel = 1) gill net (Scotland).

ossel = 2) norsel (a short piece of line on a drift net used to attach the hanging line to the head or float line at regular intervals).

osseus = bony; of or pertaining to bone.

ossicle = small bone, e.g. Weberian ossicles, ossicles of Gemminger.

ossicula auditus = bones of the ear.

ossiculith = a minute (0.05-0.5 mm) irregular, plano-convex, ellipsoidal calcareous concretion from the labyrinth of Teleostomes. Usually formed in the sacculus adjacent to the external side of the sagitta or in the lagena. Also used for statoconia, *q.v.*

ossify (ossification) = to become bony.

ossil = a short line to which a hook is attached (Shetland Isles dialect).

osteoblast = a cell which deposits calcium salts and forms bone, the precursor cells of osteocytes. Osteoblasts migrate to centres of bone formation during early development.

osteoclast = a bone cell which is involved in bone resorption, may be mononucleated in fish.

osteocrania = plural of osteocranum.

osteocranum (plural osteocrania) = the bony part of the skull, becoming more developed as the cartilaginous elements ossify during development or evolution.

osteocyte = a cell derived from an osteoblast responsible for building the hard matrix of bone (supportive fibres impregnated with calcium hydroxyapatite). Osteocytes are usually found in lacunae embedded in the hard matrix but may be superficial to the matrix, e.g. in some fish scales.

osteoderm = scute; dermal bone lying over the epidermis as armor or ornamentation.

osteodont = a type of tooth vascularisation in Chondrichthyes without an internal pulp cavity but by scattered tiny cavities and canals penetrating the osteodontine layer of the root and the internal crown material (Herman *et al.*, 1994).

osteology = study of the structure and development of bones.

ostium = a small opening into a duct or space.

ostolite = fossilised otoliths.

ostraciform = a type of undulatory locomotion in which the body is inflexible and only the tail undulates, e.g. in Ostraciidae. See also anguilliform, carangiform, labriform, thunniform.

ostracin = ostracitoxin.

ostracitoxin = the fish poison secreted into the water by fishes of the genus *Ostracion* (Ostraciontidae). The poison is heat stable, non-dialysable, hemolytic, and non-protein in nature.

ostracophil = 1) a reproductive guild (*q.v.*) of snail loving, referring to small members of some African Cichlidae that live in empty snail shells.

ostracophil = 2) a reproductive guild (*q.v.*) of snail loving, but referring to fish hiding eggs in invertebrates. Eggs are deposited by an ovipositor inside clams but also in crabs or ascidians. The eggs have large, dense yolks, lobes or unculi, photophobia prevents expulsion of free embryos, and there are large embryonic respiratory plexuses and carotenoids, e.g. the cyprinid *Rhodeus sericeus*.

ostracophilous = adjective for ostracophil.

otarena (plural otarenae) = a mineral particle entering through the endolymphatic pore and combining with calcareous granules to form the otoconia in cartilaginous fishes.

otarenae = plural of otarena.

other fish to fry = other matters to attend to, other concerns or interest to pursue. A variant is bigger fish to fry.

other jal = a large cast net in Bengal, India.

otic = relating to hearing, to the ear.

otic capsule = the skeleton surrounding the inner ear or otic vesicle, composed of the prootic, opisthotic, exoccipital, and supraoccipital.

otic region = the skull area containing hearing and equilibrium organs and including endochondral bones (autosphenotics, autopterotics, opisthotics, epiotics), dermal bones (intercalaries, pterotics) and mixed origin bones (sphenotics, prootics).

otic shelf = the basioccipital is divided on either side of the basicranial fenestra to form two shelves in Sarcopterygii. The jugular vein runs along the top of these shelves toward the intracranial joint.

otic vesicle = an epithelial sac behind the fifth rhombomere forming the semicircular canals dorsally and the otolith organs ventrally.

otoccipital = the area of the posterior braincase containing the otic and occipital regions in Sarcopterygii.

otoconia = plural of otoconium.

otoconium (plural otoconia) = ear dust; a minute transparent calcite crystal with well developed faces secreted within the labyrinth and mixed with mineral particles or otarenæ.

otocyst = a cyst or large vesicle that contains the otoliths. Divided into an upper portion with three semicircular canals and the utricle and a lower or vestibular portion containing the saccule and the lagena.

otolin = a protein comprising 0.2-10.0% of the otolith.

otolith = a free body in the inner ear used for perception of acceleration including gravity. Composed of aragonite, a form of calcium carbonate, with up to 10% otoxin, a protein. The lapillus lies in the utricle, the sagitta in the saccule, and the asteriscus in the lagena. Also called statoliths or ear stones, and incorrectly ear bone. See otoconium, marginaria and jewellery.

otolithometry = age estimation from zones in the otoliths.

otolithi = plural of otolithus.

otolithus (plural otolithi) = otolith.

otoro = the fattest form tuna from the lower belly as served in a sushi restaurant. See chutoro.

otter = 1) a short weighted plank with fish lures, controlled from shore and tending to shear outwards when pulled through the water.

otter = 2) paternoster rig (a fishing rig where the hooklength branches from the mainline. Various styles exist and may have rigid wire branches with several hooklengths. St. Peter is supposed to have used a paternoster ("our father") rig to catch fish, hence the name).

otter = 3) the barb of a hook, in reference to those used by poachers since the barb was as apt at catching fish as otters.

otter = 4) a piece of wood or metal attached to a fishing line and manipulated to disengage the hook if it becomes entangled under water.

otter board = 1) a large, heavy, flat piece of wood and metal on each side of the mouth of an otter trawl; the boards plane or shear through the water and keep the net mouth open. Also called otter door, trawl door, trawl board. The term is also used for any shearing device used to separate lines or drive a line deeper in the water. Various models and designs exist.

otter board = 2) originally a spiked board used by poachers. It was trailed in the water and made to rear like an otter. Salmon were attracted to it and impaled on the spikes.

otter board stow net = a bag net with two wings, one connected to the river bank and the other to a floating otter board. The otter board keeps the mouth of the net open. The otter board can be manipulated to close the mouth of the net to allow boats to pass.

otter fishing = use of trained otters to catch fish in China. The otter is muzzled to prevent it eating the fish and is tied by a line to its trainer. The otter may catch the fish or chase them into nets which are then hauled out with the otter and the captured fish, cf. cormorant fishing. Also carried out in India, Burma, Malaysia, Thailand Sumatra and Sri Lanka, as well as in various parts of Europe, central and south America.

otter trawl = a towed net that strains demersal fish out of the water. Rectangular otter boards of wood or steel on the tow ropes plane through the water and help keep the mouth open and give the trawl its name; floats on the headrope and weights on the ground line also assist in this.

otter twin trawl = two trawl nets working together with a single pair of otter boards and the inner wings attached to a sledge.

ouananiche = land-locked Atlantic salmon, *Salmo salar*.

oulgit = tainted fish or meat (Shetland Isles dialect).

ounce = 28.3495 g (avoirdupois, abbreviated as oz), 29.573 g water (fluid ounce, abbreviated as fl oz), 28.413 cm<sup>3</sup> (Imperial fluid ounce, abbreviated as fl oz<sub>BI</sub>), 31.103 g (troy ounce, abbreviated as oz tr).

out of the hettle, into the kettle = a Scottish expression used to impress a purchaser with the idea that the fish is perfectly fresh, hettle being a rocky bottom lying between the roadstead and the shore on the Firth of Forth.

out migration = the seasonal migration of salmonids and other fishes from a stream to a lake or the sea, e.g. American shad, *Alosa sapidissima*.

out sea = deep sea.

outbreeding = in aquaculture, the use of unrelated individuals for reproduction.

outer net = armouring (the outer wall of large mesh netting forming part of a trammel net, q.v. Also called outer wall, outwall, outwalling, trancher, wall, walling, windows).

outer slope = reef slope (the reef seaward of a reef crest). It is sometimes used to represent the lower reef slope.

outer wall = outer net.

outfall = 1) the mouth or outlet of a river, stream, lake, drain or sewer.

outfall = 2) the first salmon falling from a net after a haul.

outfish = to catch more fish than someone else.

outfit = the supplies and gear needed for a man or vessel to prosecute the cod fishery off Newfoundland.

outflow = 1) flowing out, efflux.

outflow = 2) amount of water flowing out.

outgoing loan = a specimen(s) loaned by a museum to another institution or to a researcher.

outgroup = one or more species or other higher monophyletic taxa used to determine polarisation of character states, not including the taxa under study.

outlet = the point where water exits a water body such as a river or lake.

outlet box = monk (a weir structure used to regulate water depth in a pond with a screen to retain fish).

outlier male = a male *Oncorhynchus gorbuscha* which is smaller than the dominant male, is coloured like a female, and maintains a position to one side of a spawning pair; in this fashion it is able to deposit sperm since the dominant male does not chase it away.

outlying tackle = fishing tackle set in the water.

outmigration = the seasonal migration of salmonids and other fishes from a stream to a lake or the sea, e.g. American shad, *Alosa sapidissima*.

outplanting = hatchery-reared fish released into streams for rearing and maturing away from the hatchery sites.

outport = a small Newfoundland fishing community.

output controls = management methods aimed at directly limiting fish catch or landings through total allowable catch and quotas.

outrigger = 1) a long and thin float attached to a vessel, such as a canoe, by projecting spars. This serves to prevent capsizing. Also refers to any vessel fitted with such a float.

outrigger = 2) in sea angling, long fibreglass or metal poles used for trolling baits away from the side of a boat.

outrigger trawl = beam trawl (a trawl with short wings and a head rope attached to a metal or wooden beam, 10 m or more long, which keeps the net open horizontally and scrapes the bottom to scoop or startle fish into the net. Metal frames on each end of the beam keep the net open vertically. Beam trawls are used mainly for flatfish (and shrimp)).

outside bend = the curve on the outside line of a water channel or grass bed. In a channel, water depth is greatest there.

outside door = the seaward entrance to a cod trap.

outside stage = a part of the elevated platform on the shore at which fish are landed and prepared for salting in the Newfoundland cod fisheries.

outstafe = a wooden spar used for stretching out a fishing net (Scottish dialect).

outwall = outer net.

outwalling = outer net.

ova = plural of ovum.

oval = a portion of the gas bladder, rich in capillaries, for the absorption of gases. Circular muscles surround the organ and in contraction shut the oval off from the bladder; longitudinal muscles contract to re-expose it.

ovarian = of or pertaining to the ovary.

ovarian artery = a branch of the coeliac artery extending on the left side of the intestine to the dorsal surface of the ovary.

ovarian flap = a flap of tissue or trophonema, a structure in *Jenynsia lineata* used to absorb histotrophe or ovarian milk.

ovarian milk = histotrophe (or uterine milk, a secretion produced by teleost livebearers for absorptive feeding during fish ontogeny).

ovarian tunic = the membrane covering the ovary.

ovary = the female reproductive organ, producing eggs.

ovary cyst = a disease evidenced by swollen ovaries filled with a yellowish or reddish fluid, of unknown cause.

ovate = egg-shaped.

over stock = to stock with fish in excess of the carrying capacity of the water body.

over yearling = Salmonidae having spent at least one winter in a stream.

over-capacity = a situation where the fishing capacity of a fleet exceeds the availability of fish to it.

over-compensation = a cycling or maturation technique that involves adding much more pollution to an aquarium than fish will create when the tank is fully stocked. This allows stocking with many fish at once.

over-exploitation = rate of exploitation where the resource stock is drawn down below the size that would, on average, support the long term maximum potential yield of the fishery.

over-feeding = excessive feeding in aquaculture leading to abnormalities in development and growth or economic loss.

over-harvested = slaughtered.

over-ripening = unfertilised eggs that are aging and losing quality or viability.

overall mortality rate = an average mortality rate calculated over several length or age classes. May be an average of rates of several classes weighted by the time they have acted or an average of rates of several classes weighted by the number of individuals they have acted on.

overbreeding = aquarium fish may breed or be bred more often than in nature because of the controlled conditions and ready food supply. This may result in stress-related problems and retarded growth. See also precocious breeding.

overcapacity = too many boats chasing too few fish.

overcapitalization = where the amount of harvesting capacity in a fishery exceeds the amount needed to harvest the desired amount of fish at least cost. Too many boats, too much fishing effort. May be addition of new technology rather than new boats.

overcollecting = the capture of fishes where the numbers taken threaten the numbers in the wild, e.g. taking of wild fish for aquaria.

overexploited = a stock abundance that is too low; overfished.

overfall = 1) a structure for the overflow of water, when it reaches a certain level.

overfall = 2) a waterfall.

overfeeding = excessive feeding leading to growth and developmental abnormalities in fish and to the fish not being economically useful.

overfished = a stock exploited beyond which its abundance is considered too low to ensure safe reproduction.

overfishing = 1) a level of fishing effort or fishing mortality such that a reduction of this level would, in the medium term, lead to an increase in the total catch. For long-lived species, overfishing starts well before the stock becomes overfished. See also growth overfishing (average fish caught when too small), economic overfishing (less profitable than it could be) and recruitment overfishing (too few fish left to spawn).

overfishing = 2) illegal fishing, e.g. where more than the quota is taken or other regulations are broken.

overfishing limit = the point at which fishing seriously compromises continued and sustained productivity. May be determined from biological, economic and sociological considerations relevant to that particular fishery.

overflow = water flowing from a reservoir when filled beyond capacity.

overflow prefilter = a device removing particles of algae, detritus, and other small particles before the water enters a trickle filter in aquaria. The floss in the prefilter should be replaced weekly as it soon clogs.

overgrow = 1) to grow too large.

overgrow = 2) to grow over, covering.

overhand knot = a knot tied by hagfish (Myxinidae) at the head and slid down the body to remove excess slime.

overhaul = to pull a fishing-line or net to the surface in order to determine the catch.

overhead cover = shelter protecting fish from overhead; defined by height above water level, usually less than 1 metre.

overprint = offprint.

overstock = to stock in excess of the carrying capacity of a water body.

overturn = circulation of water in lakes or the sea where seasonal temperature changes cause density differentials.

overyearling = Salmonidae having spent at least one winter in a stream.

overwinter = to keep over winter as with brood stock or to survive winter conditions.

overwork = a dangerous disorder affecting high public functionaries who want to go fishing (from "The Devils' Dictionary" by Ambrose Bierce).

oviduct = a tube used to carry eggs away from the ovary.

oviform = egg-shaped.

ovigerous = bearing eggs.

oviparity = production of eggs that hatch and develop outside the body.

oviparous = adjective for oviparity.

oviphagous = adjective for oviphagy.

oviphagy = eating eggs. See also oophagy.

oviposit = to deposit an egg during spawning.

ovipositor = a tubular extension of the female genital opening used to facilitate egg deposition, e.g. in *Rhodeus sericeus*.

ovo-testes = gonad containing both male and female primary reproductive tissue, e.g. in *Centropristes*.

ovoholotype = the holotype of an ootype.

ovoid = round or nearly round.

ovoparatype = the paratype of an ootype.

ovophile = members of the Cichlidae where the male excavates a pit in his territory for the eggs. The female takes these eggs into her mouth. In some species, the female attempts to suck up egg dummies, q.v., on the male, the male then releases sperm that the female inadvertently takes into her mouth to fertilise the eggs, e.g. in *Aulonocara*, *Haplochromis* and *Pseudotropheus*.

ovotype = ootype.

ovoviviparity = production of eggs that are fertilised and hatch inside the mother but the embryos lack a placental connection to the oviduct or uterus and so do not feed off the mother. The young are born as miniature adults, free-swimming and feeding, e.g. *Gambusia holbrooki*. See also oviparity, viviparity.

ovum (plural ova) = egg.

oxbow = a u-shaped or looping bend in a river, cut off from the main flow by formation of a new channel.

oxbow lake = a u-shaped section of river isolated from the main channel when a meandering river cuts across the neck of a meander.

oxycercal = a tail fin of tapering form (as opposed to expanded or fan-shaped form (rhipidocercal)), e.g. in *Chlamydoselachus*, *Anguilla*, *Mastacembelus*, *Fierasfer*.

oxygarum = garum (*q.v.*) mixed with vinegar.

oxygen factor = the amount of dissolved oxygen necessary to sustain fish.

oxygen minimum layer = a layer in the deep sea where oxygen levels are at their lowest level, usually about 600-900 m.

oxygen-poor layer = tropholytic layer (the deep zone of a lake where food is used faster than it can be produced).

oxygen-rich layer = trophogenic layer (the water layer where photosynthetic production of organic matter exceeds destruction).

oxygenation = any method of introducing air into water.

oxyluciferin = a substance concerned in production of living light (bioluminescence), luciferin being oxidized in the presence of the enzyme luciferase to produce oxyluciferin and light.

Oxyrhynchus = a famous archeological site at the town of el-Bahnasa on the Nile in Egypt. The Greek name was Oxyrhynchon Polis, meaning "town of the sharp-nosed fish". The town was named for the fish that ate the penis of Osiris in Egyptian mythology. The species of fish is probably a mormyrid. Egyptian priests were forbidden to eat fish.

oxytetracycline = an antibiotic injected into fish that leaves marks on growth structures such as otoliths. When the fish is recaptured, the elapsed time is known and the mark of the antibiotic can be used to validate age estimates.

oyster bar = a shallow reef area where oysters are exposed at low tide; a good fish habitat.

oz = ounce (28.3495 g avoirdupois).

oz tr = troy ounce (31.103 g).

ozle = the line by which cork buoys are attached to a herring net (Scotland).

## P

P = 1) abbreviation for pectoral fin.

P = 2) Permian, a geological period of the Palaeozoic ca. 290-245 million year ago.

P = 3) symbol for the (parental) generation in which fertilization produces hybrids.

P1 = abbreviation for pectoral fin.

P2 = abbreviation for pelvic fin; V is an alternate abbreviation.

p = probability.

p. (plural pp.) = page.

p.m. = post meridiem, for after noon indicating time after 12.00 noon.

p. p. = *pro parte*.

p.p.m. = parts per million.

p.p.t. = parts per thousand.

Pacific Trash Vortex = Great Pacific Garbage Patch (a gyre in the central North Pacific Ocean between about 35-42°N and 135-155°W, having large amounts of plastic and other garbage trapped by the currents of the North Pacific Gyre. The size of the patch has been estimated at 700,000 km<sup>2</sup> to 15 million km<sup>2</sup> with perhaps over 100 million tons of debris. A major source of pollution and of plastics ingested by marine organisms as it resembles zooplankton. May form a habitat for fishes in the featureless open ocean. Also known as the Eastern Garbage Patch.

Pacini's Law = the nervous face of the electroplax of an electric organ becomes electrically negative to the non-nervous face during the discharge, whatever the orientation of the organ as a whole (except in *Malapterurus*).

pachy- (prefix) = thick.

pack = 1) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for perch.

pack = 2) a large school of dogfish (*Squalus acanthias*), a term used by fishermen.

pack = 3) a quantity of fishing line belonging to a member of a boat's crew, the amount varying with the district (Scottish dialect).

pack ice = floating ice that has been driven together into a single mass.

pack rod = a fishing rod that can be disassembled into short sections for easy transport.

package = 1) any type of barrel for shipping dried fish (Newfoundland).

package = 2) cured herring (Newfoundland).

packed like sardines = anything tightly packed or confined, after the appearance of sardines in a can. Usually refers to people in overcrowded conditions.

packie = a bundle of fishing lines. Each bught is fitted with from nine to fourteen hooks. It is usual to call twenty buughts a packie, and the whole of the packies that a boat carries is a fleet of tows (Shetland Isles dialect).

packing fish = a method for keeping partially dried and dried cod-fish from spoiling or developing dun, q.v., when damp weather conditions prevailed that did not allow for spreading. Salted and drying fish would be moved from one pile and repacked into another to keep dun and other conditions from harming the fish.

packload = a dry measure, used sometimes for fish, although mainly for salt and corn.

pad = a wicker basket used as a fish measure.

padda = fish slices dipped in a paste of clarified butter or oil with chilies, mustard and other spices (Malabar, India). Packed in jars.

paddy = a field for growing rice, flooded with water and often stocked with fish.

paddy-cum-fish culture = the combined culture of rice in flooded fields or paddies with fish during the flooded stage. Canals, pools and trenches can be constructed around the fields to maintain fish during dry seasons.

padec= fermented fish paste made with rice husks (Laos).

padell = paidle.

paedomorphosis = phylogenetic retention of juvenile or larval characters in the adult.

paedophage = a feeder on larval or embryonic forms; larvivore.

paedophagous = larvae or embryo eating; larvivorous, e.g. some *Haplochromis* which feed on cichlid embryos and larvae, sucking them out of the maternal mouth using thick, rubbery lips, as opposed to post-larval to adult stages.

paedophore = paedophage.

paellick = pelek.

paellik = pelek.

page precedence = when two names for the same taxon are first published in the same publication, then the one which appears on the earlier page has precedence. Page precedence does not necessarily mean priority as well; this is determined by the action of the first reviser.

page reference = citation of the page or pages where an item of interest occurs. May be of particular significance in reference to names in publications concerning taxonomy and nomenclature.

pagophilic = ice-loving, applied to organisms for which ice is important in some part of their life cycle.

PAH = abbreviation for polycyclic aromatic hydrocarbons.

pahutoxin = ostracitoxin.

paidle = 1) a pocket in a fish net, especially that in a small stake-net used for catching flounders and trout (Scottish dialect). Also spelled padell, peddle, pydle and pyddle.

paidle = 2) a net with a paidle (1) (Scottish dialect).

paidle = 3) a cone made of rushes and set in a river to catch fish such as trout on their downward migration (Scottish).

pain = fish have nociceptors, a peripheral nervous receptor, sensitive to noxious stimuli and reporting to the central nervous system where the stimulus is perceived and motor responses initiated. Fishes can sense stimuli but these receptors provide no evidence of a psychological experience of pain as felt by humans. The concept of pain in fishes in the psychological sense is a hotly debated topic. The cortical regions where humans experience pain are lacking in fishes. The word "pain" should perhaps be used only where there is a conscious mind having an unpleasant psychological experience.

painted fish = aquarium fishes that have been artificially coloured by injection with a dye, dipping in dye or by feeding with dyed food. This marketing ploy fades after several months. Fatality levels are high and campaigns to ban this process have been mounted. Also called juicing. See also GloFish.

pair bond = the temporary or permanent association formed between a female and male fish during courtship and mating.

pair trawling = bottom or mid-water trawling by two vessels towing the same net. Very large nets can be towed in this manner by relatively small boats and the net is generally hauled alternately aboard the two vessels for processing of the catch. The net mouth is kept open by the outward pull of the two vessels.

paired appendage = paired fin.

paired fin = the pectoral and the pelvic fins (as opposed to the vertical fins).

paitie = patie.

paksiw = gutted or un-gutted fish, boiled with coconut or vinegar, and other spices and simmered over a slow fire (Philippines). See also sinaeng.

palace = a cellar or first floor of a house for curing and storing pilchards (Devon and Cornwall dialect).

palaeo- (prefix) = old, ancient.

Palaearctic = the biogeographic realm comprising Europe, northern Asia and North Africa.

Palaeocene = a geological epoch within the Tertiary Period ca. 65-54 million years ago.

palaeochannel = a former river channel.

palaeogenetic = a disjunct distribution, where remnant populations are indicative of a once wider distribution.

palaeoichthyologist = one who studies fossil fishes.

palaeolake = an ancient lake.

Palaeozoic = a geological era ca. 570-245 million years ago comprising the Cambrian, Ordovician, Silurian, Devonian, Carboniferous and Permian periods. Also spelled Paleozoic.

palatal = of or pertaining to the roof of the mouth.

palatal organ = a structure on the roof or palate of the mouth used to taste and touch food items in *Carassius auratus*.

palate = the roof of mouth; may be used to include the bones of the roof of the mouth, especially the vomer, palatine, pterygoid, ectopterygoid and parasphenoid; may include also the maxilla and premaxilla, as well as any braincase elements which are exposed on the roof of the mouth.

palatine = a paired, endochondral bone on the roof of the mouth lateral to the (pre) vomer. Properly called the autoplatine since it has a double nature, being covered ventrally by the dermal dermopalatine, which is often dentigerous. The palatine is cartilaginous in *Lepisosteus* and in *Amia* the dermopalatine is independent, not fused to the autoplatine.

palataobasal ridge = a ridge formed by the ventral part of the ethmoid articulation of the palatoquadrate in sharks.

palatoquadratal bar = palatoquadrate.

palatoquadrate = the cartilaginous, functional upper jaw of Elasmobranchii and Holocephali and the embryonic upper jaw of other gnathostome vertebrates. In adult Dipnoi, Crossopterygii and Actinopterygii, produces the autoplatine, metapterygoid and quadrate bones. Also called palatoquadrate or palatoquadratal bar, palatoquadrate cartilage, pterygoquadrate bar, epimandibular cartilage and maxillar cartilage.

palatoquadrate bar = palatoquadrate.

palatoquadrate cartilage = palatoquadrate.

pale around the gills = nauseated, as applied to humans.

pale cure = lightly salted and cold smoked haddock split so the bone is on the right hand side.

pale smoked red = lightly smoked red herring.

paleo =palaeo.

Paleozoic = Palaeozoic.

palingman = 1) a seller of eels (archaic).

palingman = 2) a fishmonger (archaic).

Palissy ware = dishes covered with coloured models from nature, such as fish, in high relief. After Bernard Palissy (1510–1590).

palistrophy = the coalescence or fusion of vertebrae.

pallace = palace.

pallet = the glass or metal float on a fishing net (Scottish dialect).

palm = a heavy mitten (glove without fingers) used to protect the hand in splitting fish or hauling lines (Newfoundland).

palmata zone = the region of a reef crest of a bank or barrier reef that is closest to the water surface.

palmate = shaped like a hand or palm.

palmered = feathers wound perpendicular to the shank of a hook on an artificial fly.

palming = use of the hand against the spool edge of a reel to control drag in fighting a fish.

palomar knot = an easily tied knot used by anglers to attach a hook, swivel, snap or lure to a line. Has a strength of 85% and the double loop through the eye provides a cushion for added strength. Ideal for braided lines. Various websites have animated steps showing how to tie this knot.

palu hook = a wooden hook used in the south-central Pacific Ocean to capture oilfish, *Ruvettus pretiosus*. Protective sticks (usually 6-8) are lashed to the line near the hook to prevent the sharp teeth of the fish from severing the line.

paludal = of a marsh or marshes.

paludarium = an aquarium with a dry land area as well as water.

palustrine = pertaining to swamps or marshy habitats, usually shallow and of limited extent.

pan = 1) a large depression without an outlet, periodically flooded with water, often salt-encrusted.

pan = 2) a shallow, circular container used in rendering fish oil (Newfoundland).

pan = 3) a dense shoal of small fish (Shetland Isles dialect). See also panner.

pan- (prefix) = all, all pervading.

pan fish = any kind of small fish suitable for cooking, often fried in an open pan, and generally affording but minor sport. Used in contrast to the larger species of game fish.

pan-dressing = a means of cleaning small fish that are to be cooked whole rather than filleted.

pan-global = all the globe or world; although global would seem to suffice.

pan-ready fish = 1) fish ready prepared for cooking. Also called kitchen-ready.

pan-ready fish = 2) fish specially prepared to make a good presentation. Also called kitchen-ready.

pan-size fish = any small fish that can be fried whole.

pan-temperate = throughout the temperate zone.

pan-tropical = throughout the tropics.

pancake ice = mostly circular pieces of ice from 3 cm to 3 m across, less than 10 cm thick, and with raised edges.

pancaking = skimming along the surface on one side. Usually seen in compressed fish having a panic reaction.

pancreas = endocrine gland containing islets of Langerhan(s) which produces secretions controlling carbohydrate metabolism. Often located diffusely in the region of the gall bladder, spleen, pyloric caeca and small intestine in fishes. Size and number of islets of Langerhans increase during the spawning season.

pancreas disease = a probable viral infection of salmonids causing a degeneration of the pancreas causing high mortality in the salmonid marine phase.

pancreatic islets = the endocrine part of the pancreas producing hormones and, in particular, insulin. Also called islets of Langerhan(s).

pancreaticoduodenal vein = delivers blood from the pancreas, pyloric caecae and adjacent duodenum to the hepatic portal vein.

panel = a sheet of netting made of two or more sections joined together.

panes = rows on a flake, *q.v.*, formed by loose longers, *q.v.*, that held flake boughs in place and between which fish were laid in the Newfoundland fisheries. Also called lists.

panmictic population = one in which all members are equally likely to mate.

panner = a heavy catch of herring (from pan (3) above (Shetland Isles dialect).

pannibrad = a pot for melting or rendering fish livers (Shetland Isles dialect).

pannibrod = pannibrad.

pannier man = a fishmonger, a hawker of fish (archaic).

pannyman = pannier man.

pantothenic acid = a B vitamin essential in the diet of many cultured species.

paper fish = a TAC, *q.v.*, much greater than real fishing possibilities.

paperfish stage = a prolonged pelagic phase in development characterised by a deep, strongly compressed, silvery body with a naked ventral keel in Cheilodactylidae.

papilla (plural papillae) = a small, nipple-like, fleshy protuberance.

papilla neglecta = macula neglecta (macula neglecta = a sensory structure located in Teleostomi in the utriculus of the inner ear near the opening of the ampulla of the posterior vertical semicircular canal, in selachians within a duct (posterior canal duct) through which the posterior vertical semicircular canal connects with the sacculus, while in the batoids it lies in the wall of the sacculus adjacent to the opening of the duct. It may have a neuromast associated with its sensory tissue. This structure has been demonstrated to be a sensitive vibration receptor in *Raja*. Also called crista neglecta and crista quarta).

papillae = plural of papilla.

papillary = a trio of small bones lying at the hind end of the priapium (*q.v.*) surrounding wholly or partly the genital pore and sometimes bearing a number of thin bony projections with hooklets, in the Neostethidae.

papillate = papillose.

papilliferous = papillose.

papilliform = slender, elongate and pointed, e.g. teeth.

papilliform hyoid barbel = a short fleshy protuberance in the hyoid region.

papillon = trade name for salted cod weighing less than 400 g at landing.

papillose = covered with papillae.

para- (prefix) = beside, by, along, beyond.

paraallotype = parallotype.

parabranchial chamber = the portion of the gill cavity lying between the gills and the gill cover; also called branchial chamber. See orobranchial chamber.

paracaudal organ = a fatty organ opening through pores on the caudal fin of Engraulidae. The organ is hypothesised to release stock specific fatty substances.

parachondral bone = bone formed from the ossification of connective tissue surrounding cartilage. Later the ossification penetrates the cartilage so the final bone has a mixed origin. Also called chondral or endochondral bone.

parachordal plate = an embryonic cartilaginous rod on either side of the notochord between the hind brain and the otic capsules, and which help form the skull.

parachute fly = a type of dry fly with the hackle wrapped horizontally under the hook or at the base of the wings providing an outrigger flotation.

paradentary = a bone lying in the maxillomandibular ligament with the proximal end of the bone forming a ball and socket joint with the dentary near the symphysis in *Ceratostethus* (Neostethidae).

parafluvial = pertaining to groundwater or areas adjacent to the main river channel.

paraformaldehyde = a white crystalline solid, the polymerized form of formaldehyde gas (usually 90-97% pure). It has an irritating odor and can emit potentially flammable and explosive formaldehyde vapors at room temperatures. Dissolved in water, it can be used to fix and preserve fish specimens in the field, having less weight in transport than liquid formalin solution. As a white powdery substance, it is best transported across borders in its fully-labeled container.

paragenotype = a genotype (*q.v.*) designated later than one by the first revisor.

parahyoid = urohyal (a flat, median, deep, endochondral bone below the ceratohyal; a tendon bone arising in the septum between the longitudinal muscles of the isthmus. Absent in such primitive fishes as *Lepisosteus*. Also called clidost, episternal and interclavicle).

paralectotype = any one of the original syntypes remaining after the selection of a lectotype.

parallel drainage system = a pattern of rivers caused by steep slopes with some relief, often found in mountainous areas. The rivers are fast and straight with few tributaries. See also annular, dendritic, deranged, rectangular and trellis drainage systems.

parallel evolution = the development of similar forms by related but distinct phylogenetic lineages.

parallel key = bracketed key (a dichotomous key in which contrasting parts of a couplet are numbered and presented together, without intervening couplets (the brackets are omitted). Used in some fish keys).

parallel ponds = in aquaculture, a series of diversion ponds, arranged in parallel and each having an individual inlet and outlet for water.

parallelism = possessing similar characters by two or more related taxa in separate lineages.

paralliconic species = one described in terms of its difference from another species, instead of in absolute terms, e.g. certain species pairs of *Coregonus* and *Ammodytes*. Opposite to staticonic.

parallotype = paratypes of the same series and sex as the allotype (*q.v.*) described by an author other than the original author.

paramorph = a taxonomic variant within a species, so named because lack of data prevents a more accurate determination.

paraneotype = a figured specimen used in addition to the neotype. Neoparatype is also used.

parapatric = adjacent but non-overlapping distributions.

parapatric speciation = the differentiation into distinct species of populations experiencing some gene flow.

paraphyletic = adjective for paraphyly. "Fishes" as a group are paraphyletic.

paraphyly = a taxon that does not include all descendants from the common ancestor of its members.

parapineal organ = the left side counterpart of the pineal organ, *q.v.*, in the dorsal midline between the telencephalon and the optic lobes. It is reduced or absent in some fishes.

parapophyses = plural of parapophysis.

parapophysial stay = a transverse bony bridge which connects the parapophyses of the abdominal vertebrae and separates the dorsal aorta from the kidneys, e.g. in Stichaeidae.

parapophysis (plural parapophyses) = a long, transverse process arising from the abdominal vertebral centrum. Parapophyses serve to support epipleural ribs (*q.v.*) when present and, in Gadidae, the gas bladder. In Clupeiformes they are not fused to the vertebrae. Also called transverse process, basal process and basopophysis.

pararostrum = a projection of the posterior part of an otolith, somewhat anterior to the postrostrum, the most posterior point.

parasagittal = a plane parallel to the sagittal plane which divides the left and right sides.

parasitic male = complemental male (the small, usually degenerate (except for gonads) male which lives attached to the female, e.g. some Ceratioidei. Parasitic male is the less preferable name).

parasitic spawning = fertilisation of eggs by a subordinate male while the female and dominant male are spawning.

parasitism = the manner of life in which an organism lives for some period of time, to its own benefit, in or on another organism (the host) to the host's detriment, e.g. *Ichthyomyzon* on *Esox masquinongy*; *Vandellia* in the gill cavity of *Platystoma*.

parasitofauna = the diversity of parasitic animals on a host such as a fish.

parasphenoid = the median dermal bone extending along the base of the cranium, posterior to the prevomer (or vomer). May bear teeth, e.g. in *Amia*, or molariform teeth, e.g. in Albulidae.

parasymphysial = the first anterior tooth row in Chondrichthyes, if a symphysial tooth row is absent (Herman *et al.*, 1994).

parataxon (plural parataxa) = 1) a fossil taxon based on a part of the organism, e.g. fossilised fish teeth.

parataxon (plural parataxa) = 2) a taxon based on only a particular stage in the life history of an organism.

parataxon (plural parataxa) = 3) a domesticated taxon, isolated from its wild ancestors by human intervention.

parataxa = plural of parataxon.

paratenic host = a fish which serves as an additional or optional intermediate host for a parasite. No development of the parasite occurs but the host fish may serve as an essential link in the parasite life cycle. Also called transport host.

parathyroid gland = absent in fishes, function being replaced by corpuscles of Stannius, *q.v.*

paratotype = a paratype from the same locality as the holotype.

paratype = every specimen, other than the holotype, in the type-series; all the specimens on which the author bases the series, except any that (s)he refers to as variants, or doubtfully associates with the nominal species, or expressly excludes from it.

paratype allotype = a paratype from a different locality than the holotype.

paratype omotype = a paratype from the same locality as the holotype.

paravane = a flat board used in angling and commercial fishing to make the line shear laterally or downward. Lateral shearing enables two lines to be towed behind a boat and downward shearing helps send the baited hook into deep water. Also called shearing boards and otter boards.

paravertebral = along the same plane as the spinal column.

paraxial hypoblast = found lateral to the axial hypoblast and formed mostly or entirely of mesoderm. It forms somites and their derivatives in the trunk and muscles and endothelium in the head.

pardaxin = a man-made chemical from the Moses sole (*Pardachirus marmoratus*). The sole produces a milky chemical from its dorsal and anal fins that freezes the shark jaw and generally repels sharks. It was only effective when squirted into the shark's mouth (rather risky).

parent population = any population considered as the source or origin for the population under study or analysis.

parental biomass = the weight of the adult spawning population of a species. Also called spawning stock biomass.

parental family = where both parents equally share the duties of caring for the young; usually formed by monogamous, open-water brooders, although exceptions are common, e.g. in the Cichlidae. Sexes are difficult to separate on external experience. Also called nuclear family.

parenteral = entry not through the intestine but through skin, cuts, etc.

paresthesia = numbness, tingling, burning, prickling and increased sensitivity, all human neurological symptoms of ciguatera poisoning (q.v.).

parethmoid bone = a paired deep bone of perichondral origin lying in the front of the orbit under the prefrontal. Also called pleurethmoid, lateral ethmoid, prefrontal, exethmoid, and also ectethmoid (latter only present in birds so not be used in fishes).

parhypural = the last haemal spine that forms part of the the hypural plate. It is considered as a typical haemal spine or a hypural by authors but is recognised as distinct because it bears a hypurapophysis (q.v.), is notched to allow the caudal artery to exit the haemal canal and supports the lowermost principal caudal fin ray, e.g. in Siluriformes.

parietal = a dermal paired bone on each side of the top rear of the head over the auditory region, behind the frontals and partly or wholly separated by the supraoccipital. In *Amia* and Elopidae both parietals meet in the midline and separate the frontals and the supraoccipital, forming a type of skull called medioparietal. In contrast, a lateroparietal skull has the frontals and supraoccipital meeting in the midline, separating the parietals, e.g. in Gadidae. In an aparietal skull, the parietals are absent, e.g. in Syngnathiformes, Siluridae.

parietal body = a dorsal evagination of the diencephalon. See epiphysial apparatus.

parietal head spine = a spine on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

parietal pericardium = the single membrane lining the pericardium or heart cavity.

parietal peritoneum = the single layered membrane lining the pleuroperitoneal cavity.

parietal shield = a set of bones covering the skull roof posterior to the intracranial joint in Crossopterygians.

parietolateral skull = one in which the parietal bones are separate allowing the frontals to suture with the supraoccipital.

parietooccipital = dermosupraoccipital (the superficial, paired dermal bone covering the supraoccipital with which it may fuse. In many Teleostei it is a hinge for the skull articulation with the circumorbital ring. Siluridae have a posterior toothed process that secures the nuchal disc. Also called postparietal or dermal supraoccipital.

parity = the number of times a female has produced young (0 = none, 3 = three times but does not indicate number of young).

parlour trap = a trap with one or more funnels which lead into a central area, the parlour, where the fish are retained as they cannot find the narrow end of the funnel to exit. The trap may be baited.

paronym = in nomenclature, a name related etymologically to another name but spelled differently.

parotic process = a posterior lateral process of the skull formed by the pterotic and opisthotic.

-parous (suffix) = producing.

parr = a young salmonid (salmon or trout) with parr-marks before migration to the sea and after dispersal from the redd.

parr mark = one of the large dark bars or blotches found along the sides of certain young salmonids.

pars sustentaculum = fused anterior second, third and fourth vertebrae in e.g., *Ictalurus punctatus*, which supports the pars auditum, q.v.

parasuditum = a chain of ossicles on each side of the pars sustentaculum connecting the swimbladder to the inner ear in the Weberian apparatus, q.v.

pars inferior = part of the internal ear of fishes comprising two sac-like structures, the sacculus and lagena, both q.v. These function principally in sound reception. The endolymphatic duct rises upwards from the sacculus and, in Myxini ends blindly in a cartilaginous capsule, in cartilaginous fishes opens to the outside via a narrow aperture, in chondrosteans and Clupeidae is open in young but ends near the endolymphatic sac in adults, and in most teleosts is absent or short without an external opening, terminating in the endolymphatic sinus.

pars superior = part of the internal ear of fishes comprising three semicircular canals, q.v., and the sac-like utriculus, q.v. Function is mainly in motion detection but may have some sound

reception. Connected to the pars inferior by a short utriculus-sacculus canal in gobies and many cyprinids.

parsimony = in phylogenetic systematics, the principle that the phylogeny requiring the least number of character changes is most likely correct (simpler is better). Use of many characters may swamp reversals and convergences as these are relatively rare and this is another form of parsimony.

*part.* = abbreviation for *partim*.

parthenogenesis = production of eggs without genetic recombination or a reduction in ploidy. The eggs develop without sperm and are clones of the female parent, e.g. in captive hammerhead and white-spotted bamboo sharks.

partial recruitment = the degree to which a year class has joined the fishable stock. When a year class is young, only some of its fish are big enough to be caught, so it is partly but not fully recruited. Very young fish are not caught at all and have a partial recruitment of zero; when a year class is half as vulnerable to fishing as it will be when fully recruited, its partial recruitment is 0.5 or 50%.

partial spawner = fish that spawn over a long time span, having eggs at various stages of development in the ovaries.

partially suppressed name = the older of two objective synonyms which is suppressed for the Principle of Priority (*q.v.*) alone, without also being suppressed for the Principle of Homonymy (*q.v.*).

particle = a small bait used in angling, e.g. hemp seed, pellets, maggots, casters, beans, peas or nuts.

particle glue = in European angling, a tasteless, odourless and colourless glue used to attach large numbers of small baits like hemp to a hook.

particle size = size ranges for sediments. The Wentworth-Udden scale is an international standard as follows:-

Size Range	Particle Name
>256 mm	boulder
64-256 mm	cobble
4-64 mm	pebble
2-4 mm	gravel, granule

1/16-2 mm	sand
1/256-1/16 mm	silt
<1/256 mm	clay

particulate feeding = catching each prey item individually, whether a zooplankter or a whole fish.

*partim* = in part, partly. May be used in citations to indicate scientific names used partly in one sense.

parts per million = "parts" by weight of a substance per million parts of water; used for pollution concentrations. 1.0 µg/mL water, 1.0 mg/L water, 1.0 mg/kg. Abbreviated as p.p.m.

parts per thousand = a chemical concentration used to express salinity. 1.0 mg/mL water, 1.0 g/L. Symbol ‰ or abbreviated as p.p.t.

parturition = the process of giving birth, e.g. said of male seahorses.

party = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for rainbowfish.

partyboat = a charter boat carrying more than six anglers and as many as 100. There is a per capita fee on a first-come, first-served basis.

parurohyal = a bone lying medially behind the ventral hypohyals and connected to them by two ligaments, e.g. in Heteropneustidae.

paso = looping (the local name of a fishing technique in Nepal, used for migratory fish such as *Schizothorax* and *Labeo* species (Cyprinidae). A nylon line with 3-5 loops is placed in a river with a coloured lead weight acting as bait. Fish, shrimps and aquatic insect larvae may also be used as bait. The fish is attracted by the bait, swims into the loop and becomes stuck by its dorsal and pectoral fins).

pass = fish passage facility.

passage = 1) the movement of migratory fish through, around, or over dams, reservoirs and other obstructions in a stream or river.

passage = 2) a leg of a voyage, which is an extended offshore trip that involves a return to the point of origin.

passage centre = a centre that plans and implements an annual smolt monitoring program, developing and implementing flow and spill requests; and monitoring and analyzing research results to assist in implementing a water budget.

passage efficiency = the proportion of juvenile fish passing a project through the spillway, sluiceway, or juvenile bypass system, as opposed to passing through the turbines.

passage facility = a feature of a dam that enables fish to move around, through, or over without harm. Generally an upstream fish ladder or a downstream bypass system.

passenger = a person carried seasonally by water to participate in the fishing enterprise in Newfoundland.

*passim* = here and there.

passing by prey = food for those fishes that lie in wait for prey that swims by.

passive gear = fishing equipment that is left to catch fish and is not actively moved through the water or attended.

Passive Integrated Transponder (PIT) tags = an integrated microchip about 11 mm long that is programmed to include specific fish information and inserted into the body cavity of the fish and decoded at selected monitoring sites. Used for identifying individual fish for monitoring and research purposes. The tag is activated by passing a hand-held scanner over the fish.

passway = fish passage facilities.

paste = 1) fish mixed with salt and ground to a fine consistency with or without added fat, spices and other seasonings. Should contain 70% or more fish. Used as a sandwich spread.

paste = 2) a bait used in Europe in angling, such as cheese mixed with a bread base.

pasteurellosis = an acute systemic bacterial disease caused by *Pasteurella piscicida* in marine fishes.

pasteurised = fish packed in airtight containers and preserved by heating at below 100°C for a limited time and stored chilled.

pasteurized caviar = caviar sealed in jars and then immersed in a water bath at about 60°C. The jars are labeled in traditional colors: sevruga (red), oscietre (yellow), beluga (blue). Pasteurised eggs may be firmer and will keep unrefrigerated for up to one year but, once opened, need to be consumed within a few days.

patch = a term describing small teeth grouped together rather than isolated.

patch reef = a section of coral reef inshore of the main reef. Usually of less than 70 m depth and unattached to a major reef structure.

patchiness = unevenly distributed in a given area. Also called patchy distribution.

patchy distribution = unevenly distributed in a given area. Also called patchiness.

patent anchor = a type of folding anchor.

paternoster rig = a fishing rig where the hooklength branches from the mainline. Various styles exist and may have rigid wire branches with several hooklengths. St. Peter is supposed to have used a paternoster ("our father") rig to catch fish, hence the name.

patey = patie.

patie = a club for killing salmon (Scottish dialect, apparently from priest, *q.v.*, and a jocular association with Pat or Patrick, a typical name for an Irishman). Also spelled paitie, patey, peatie and pettie.

patis = the free liquid extracted during fermentation of bagoong (*q.v.*) and used as a sauce (Philippines).

patriarch/matriarch family = the condition in Cichlidae where the male defends a large territory, which includes multiple spawning sites of several females. Each female assumes the responsibility of her own brood. The male is polygamous, and clear sexual dimorphism is present. This form takes place among cavity brooders. Also called male-with-harem family.

patriarchal family = the condition where no bond is formed between the parents, known only in the cichlid *Sarotherodon melanotheron*. The male carries the eggs and the fry, and there is no sexual dimorphism or dichromatism.

patrick = a fisherman or fisherman's servant of Irish extraction (Newfoundland).

patronym (adj. patronymic) = a taxonomic name derived from the name of a male person. Often used to honour a scientist or collector. Not the author or describer of the taxon. See also matronym.

patronymic = adjective for patronym.

patronymotype = a joke name for the type specimen of a new species that the owner/collector will donate to a museum if the new species is named after him/her.

pattern = 1) the way in which fishing operations are conducted.

pattern = 2) distribution of fishing mortality among age groups.

pattern = 3) in angling, any location, rig or presentation situation that can be duplicated elsewhere in the body of water being fished.

pattern = 4) the specific arrangement of fly-tying materials when tying a particular fly.

Patterson's Rule = instances of fossils overturning theories of relationship based on Recent organisms are very rare, and may be non-existent (Grande, 2000).

pauciglomerular = with few glomeruli in the kidney.

paupiette = a stuffed roll of fish fillet.

pavé = supreme cut (a slice cut off a fillet, often at a slant. Pavé (slab or block) is a term usually used for cakes and desserts).

pavement teeth = the series of rows of flat teeth found in rays and skates, and some sharks (*Hexanchus*, *Heterodontus*, *Mustelus*), used for crushing such hard foods as molluscs and crustaceans. Also called mosaic teeth.

pawl = the clicking drag mechanism in a fly reel.

pay lake = a lake where a fee is charged for fishing.

payaos = a bamboo and palm fronds raft found in southeast Asia, particularly the Philippine. The raft attracts pelagic fish seeking shelter and food. Fishermen use handlines to catch the fish, even tuna. Modern gear can be made of stainless steel, involve fish lights and sonar gear, and be used with gill nets, pump fishing equipment and purse seines, leading to overfishing.

paying away = laying out (paying out a line or net. Also called setting).

paying out = paying away.

payusnaya = caviar pressed into cakes that last for months and can be sliced like cheese (from the Russian "to shave").

pb = abbreviation for personal best, the largest fish of a particular species caught by an angler. Seen particularly in British fishing magazines.

pea = a fish egg (usually used in the plural).

pea gravel = small rocks less than half an inch (1.25 cm) in diameter often favoured as spawning areas by such fishes as basses (Centrarchidae).

peak period = a highly active part of the annual life cycle of a fish when anglers most easily make catches.

peal = a salmon of the first season, a grilse, or by extension any young salmon (British dialect).

peal stream = a salmon stream.

pearl essence = a nacreous pigment containing guanine crystals derived from scales, e.g. from herrings, used to produce sparkle in metallic paints, lip gloss and iridescent eye shadow and used in simulated pearls and plastics. Guanine crystals are rhombic platelets composed of multiple, transparent layers but they have a high index of refraction that partially reflects and transmits light from layer to layer thus producing a pearly luster. It is usually a liquid suspension of the guanine crystals that can be applied by spray, painting or dipping. Also called essence d'Orient.

pearl organ = see preferred term: tubercle, breeding. The term pearl organ has been applied vaguely and is not apt since the structure is often not pearl colored (usually small, raised, epidermal structures on regions of the head, body, or fin rays where two individuals come in

contact. May consist of aggregations of non-keratinized epidermal cells, the same with a light, superficial keratinized cuticle, or with substantial number of fully keratinized cells that are organized to form a discrete, usually conical cap. Breeding tubercles may function to maintain body contact between the sexes during spawning; in the defence of nests and territories; in the stimulation of females in courtship; and in some forms perhaps in sex and species recognition. Also called nuptial tubercles. Found in 15 families of 4 orders; Salmoniformes, Gonorynchiformes, Cypriniformes, and Perciformes (Wiley and Collette, 1970)).

pearl sharkskin = a shagreen or sharkskin leather made from a Japanese ray and used for trim on pocketbooks. Also called galuchat leather.

pearl thorn = a thorn resembling half a pearl in colour and shape in Chondrichthyes.

pearl tubercle = see pearl organ.

pearlescent = coloured like the surface of a pearl.

peat-diver = peat-spawner.

peat-spawner = killifishes (Cyprinodontidae) that deposit their eggs within a substrate. In aquaria this substrate is boiled peat moss. The fish are removed after spawning, and the peat can be removed, placed in a plastic container and wetted after the appropriate diapause, q.v., for hatching.

peatie = patie.

pebble = small and rounded rock fragments 2 or 4-64 mm in diameter (sources differ).

peck = a heading knife used by fishermen (Kentish dialect).

pectinate = comb-like.

pectinate scale = a scale with a comb-like posterior edge as in *Brevoortia* (Clupeidae).

pectiniform = pectinate.

pectoral = pertaining to the pectoral fin, its skeleton, or the adjacent region.

pectoral fin = the paired fin borne by the pectoral girdle, usually just behind the gill opening or slightly dorsal or ventral to this position. Also called omopterygium or homopterygium. This fin is generally larger than the pelvic fin and less variable in position and structure. The pectoral is low on the body in more primitive bony fishes and higher in more advanced ones. It functions to steer, brake and propel the fish. Pectoral fin ray counts include all the rays branched and unbranched. The length is measured from the origin (upper or outer part of base) to the distal tip of the fin. Abbreviated as P, P<sub>1</sub> or P<sub>1</sub>.

pectoral fin abductores = muscles originating on the medial surface of the scapula and coracoid and inserting on the medial surface of the radials.

pectoral fin adductores = muscles originating on the scapula and coracoid and inserting on the radials and base of the lepidotrichia.

pectoral fin rotatores = muscle fibres on the leading and trailing edges of the pectoral fin, continuations of the abductores and adductores.

pectoral girdle = the bony support of the pectoral fin behind the gills and usually attached to the posterior part of the skull; the "shoulder" girdle. Composed of the following basic elements (some of which may be lost): coracoid, scapula, pterygials, postcleithrum, cleithrum (main bone), supracleithrum and posttemporal. The "primary" pectoral girdle includes actinosts, scapula, coracoid, and sometimes mesocoracoid cartilage or endochondral bones and supports the fins directly. The "secondary" (and more primitive) pectoral girdle encloses the dermal post-temporal, supracleithrum, cleithrum, and two postcleithra, which are membrane bones and is only indirectly related to the fins. Also called scapular girdle, shoulder girdle.

pectoral photophore = old name for the PVO photophores in Myctophidae.

pectoral propterygium = the outer or anteriormost basal cartilage in the paired fins.

pectoral radial = one of the bony or cartilaginous supports for the pectoral fin.

pectoral ring = one of the dermal plates in members of the Syngnathidae forming a series of rings enclosing the body; the first trunk ring, just behind the head.

ped = a wicker basket or hamper in which fish such as plaice or herring were offered for sale or hawked around the country (English dialect).

pedah = salted *Scomber* spp., ripened by fermentation (Thailand).

peddle = paidle.

pedicel = a stalk-like supporting structure. Also called pedicle or peduncle.

pedicle = pedicel.

pedlar = 1) an entrepreneur and vessel owner who purchases fish from fishermen in exchange for cash or supplies, operating outside the established system (Newfoundland).

pedlar = 2) a vessel engaged in collecting fish from fishermen and in carrying supplies (Newfoundland).

peduncle = 1) caudal peduncle, pedicel (the wrist-like portion of the posterior part of the body between the end of the anal fin and the base of the caudal fin. Its length is measured between the insertion of the anal fin and the caudal flexure (the fold shown by the hind edge of the hypural plates when the caudal fin is flexed). Depth is measured vertically at the narrowest point).

peduncle = 2) pedicel.

peduncle disease = coldwater disease (a bacterial disease of juvenile and yolk-sac fry of salmonids caused by *Cytophaga psychrophila* (or *Flexibacter psychrophilus*). It occurs at temperatures below 10°C and is an external and systemic disease with lesions on the fins skin and muscles, often concentrated on the caudal peduncle. Survivors may lose the caudal fin. Severe outbreaks leave fish lethargic and spinal deformities develop, or some fish may show spiral swimming, dorsal swelling and dark pigmentation on one side of the body; mortality is common. Also called low temperature disease).

peduncular plate(s) = the bony plate(s) on the caudal peduncle of some Acanthuridae which become sharply keeled forming a defensive weapon, e.g. in Prionurinae and Nasinae (in Acanthurinae there is a posteriorly hinged erectile sharp spine in a groove).

peel = 1) a flexible mold formed by applying a thin layer of the molding material (usually a plastic compound) to an object such as a fish fossil. The peel can then be studied or sent to a researcher without the need to examine the original fossil.

peel = 2) peal.

peel stream = peal stream.

peg = 1) a swim for match fishing, i.e. a section of river, canal or lake bank is split evenly into sections for an angling contest with numbered pegs. Anglers pick a peg number at random and are only allowed to fish within the limits of the peg.

peg = 2) to throw a fly in angling (British dialect).

peg board = a piece of wood with numbered holes once used to record the weight of fish catches. Pegs were placed in the appropriate hole and catches were usually recorded as quintals.

peg-down = used in reference to a fishing competition which uses pegs to mark fishing spots for the competitors, e.g. anglers will fish a peg-down match.

pegging = use of a slip sinker and worm bait with a peg to prevent the sinker sliding up the line.

pelagic = oceanic or lacustrine waters occurring above the bottom; non-benthic. See also epipelagic and bathypelagic, holopelagic and mesopelagic.

pelagic egg = an egg which floats above the bottom.

pelagic fish = fish living in the open ocean or lake water at or near the surface and, in the sea, often undergoing lengthy migrations, e.g. tunas, sharks.

pelagic fishery = a fishery targeting pelagic species.

pelagic seine = a seine net fished almost vertically in deep water.

pelagic trawl = a net shaped like a bag which is dragged through open waters above the bottom. Lacks chafe protection gear, bobbins, discs and rollers.

pelagophil = 1) a reproductive guild (*q.v.*) of a pelagic spawner with numerous buoyant eggs, not guarded, none or poorly-developed embryonic respiratory organs, little pigment and no photophobia, e.g. *Anguilla anguilla*, *Platichthys flesus*.

pelagophil = 2) a reproductive guild (*q.v.*) of a pelagic spawner with buoyant eggs guarded at the surface of hypoxic waters and having extensive embryonic respiratory structures, e.g. *Anabas testudineus*.

pelagophil = 3) favouring surface waters for feeding, reproduction, schooling, etc.

peld = pelit.

pelek = the membrane of the roe of a fish (Scottish dialect). Also spelled paellik, paellick, pyalick, pyaellick, peyailack, pjelek and pilek.

pelit = fish not treated, e.g. as by drying, and bulk packed (Scottish dialect).

pellet = 1) a food particle compounded with all the essential nutrients needed for aquaculture species, shaped into a standard form and stored frozen or dried. It must retain its shape for some time and not disintegrate in water but be easily digestible.

pellet = 2) animal feed, typically trout pellets, fished on a hair rig, used as loose feed or crushed and used as a paste.

pellet = 3) pallet.

pellicle = a glossy film on the cut surface of a fish during dripping due to swelling of protein under the influence of brine and subsequent surface drying in the smoking kiln.

pellock = a wooden vessel for carrying bait for fishing lines (Cumberland dialect).

pellucid = transparent.

pelometoxin = a little used synonym for scombrotoxin (the poison in scombrotoxic fishes, believed to consist of histamine, saurine and possibly other toxic by-products resulting from bacterial action on histidine, a normal muscle constituent of dark-meat fishes).

pelvic = relating to the pelvic fins or girdle.

pelvic bone = 1) innominate bone (the pelvic fin bone in Gasterosteidae, sometimes a misnomer for the ectocoracoid. Also called pelvic plate, posterior process, pubic bone and medial plate).

pelvic bone = 2) the ventral element in the priapium of the Phalostethidae on which articulate the ctenactinia (*q.v.*). Also called aproctal bone.

pelvic fin = the paired fin which is located posterior, ventral or anterior to the pectoral fins (abdominal, thoracic or jugular in position). Also called ischiopterygium. It functions to steer, brake and propel the fish and acts as a keel. In the pelvic fin ray count usually all the rays are

counted except a small ray preceding the first ray and usually bound so closely to it so as to require dissection to be seen. In some fishes with reduced pelvics, the spine and the first ray may be bound together by a membrane and appear as one; both are counted, e.g. in Cottidae. Abbreviated as P2, P<sub>2</sub> or V.

pelvic fin abductores = muscles originating on the outer surface of the pelvic plates and inserting on the outer surface of the fin radials.

pelvic fin adductores = muscles originating on the medial surface of the pelvic plates and inserting on the medial surface of the radials.

pelvic girdle = the skeletal support of the pelvic fins. May be free, or may attach anteriorly to the pectoral girdle. Consists of paired bones, the basipterygia. Absent in some species, the apodal fishes.

pelvic plate = innominate bone (the pelvic fin bone in Gasterosteidae, sometimes a misnomer for the ectocoracoid. Also called pelvic bone, posterior process, pubic bone and medial plate).

pelvic terminus = a small spinous knob at the end of the long pelvic girdle of Balistidae.

pen = 1) an enclosure in the water for aquaculture made of netting on a frame; it serves to keep desired fish in and unwanted species out.

pen = 2) a place in the hold of a ship where fish are kept while fishing or transporting the catch or where fish are iced or salted.

pen = 3) pan (2).

pen board = one of a series of boards in the hold of a ship that prevent fish movement.

pen culture = cage culture on a large scale (rearing of fish in cages, on the bottom or floating. Cages may be made of wire or netting).

pencil float = a large, slim balsa or hollow plastic float used in fishing live or dead baits for pike (*Esox lucius*) or zander (*Sander lucioperca*) in Europe. Attached by the bottom only and used in still or slow waters.

pendle = in Cichlidae the behaviour where two fish face each other, advancing and retreating in turn.

pendulum feeder = demand feeder (a device allowing measured amounts of food to be delivered when triggered by fish in aquaculture, operating on a pendulum).

penis = male copulatory organ, e.g. in Bythitidae, although intromittent organ is to be preferred.

pennant = a handling wire connecting warp to bridle and allowing the bridle to by-pass the otter board of a trawl.

penner = a trunk or box for keeping fish alive (Sussex dialect).

pennyman = pannier man.

penstock = a gate or sluice used to control water flow.

penultimate = the one before the last; the second from the end.

pep = pip.

pepper fish = not a fish but a cultivar of the chili pepper plant *Capsicum annuum*. The fruit resembles a swimming fish because of its variegation.

peppered = used to describe a pigment pattern of dark stippling.

pepple = to come up suddenly to the surface as a fish does to take a fly (Lancashire dialect).

pepsin digestibility = a measure of the nutritional availability of protein in fish meal, determined by the amount of protein digested by pepsin under controlled conditions.

per- (prefix) = through.

per capita consumption = the amount of fish eaten per person in a given area or country, usually on an annual basis.

perch = 1) a member of the family Percidae, more specifically *Perca fluviatilis* in Eurasia and *P. flavescens* in North America.

perch = 2) an old English measure of distance, also called a rod or pole, equivalent to 5.5 yards (5.03 metres), sometimes encountered in older scientific literature.

perch punch = bait made of chopped worm and some liquid flavouring frozen with small rocks in a convenient container. Removed from the container, they can be thrown into a fishing area to slowly melt and attract perch and trout. Used in Europe.

perched culvert = a culvert whose outlet is too high to allow passage of fish.

perennial = said of a stream with continual flow. Opposite of intermittent, q.v. Also said of lakes of other water bodies with water year round.

perfect loop knot = a knot used by anglers to connect lures or flies to a heavy leader; does not affect the action of the lure or fly. Various websites have animated steps showing how to tie this knot. Also called perfection loop knot.

perfect name = *nomen perfectum* (a perfect name, an available name which when originally published met all mandatory requirements of the Code and needed no correction of any kind, but which is validly alterable by change of ending).

perfection loop knot = perfect loop knot.

perforate = pierced.

peri- (prefix) = near, around, enclosing.

perianal = near or surrounding the anus; peritroct.

perianal organ = an organ near or surrounding the anus, e.g. in the Chlorophthalmidae.

periblast = a thin membrane in Teleostei lying below the embryo and surrounding the yolk. An old term for the yolk syncytial layer.

peribranchial chamber = the chamber exterior to the branchial bars and which communicates with the outside by an atrial pore in Amphioxo.

pericardial cavity = the coelomic cavity containing the heart.

pericardial sac = parietal pericardium.

pericardium = a coelomic chamber around the heart.

perichondral bone = formed from an ossification starting at the perichondrium of a cartilage and rapidly extending internally. Also called chondral or endochondral bones.

perichondria = plural of perichondrium.

perichondrium (plural perichondria) = a sheath of connective tissue covering a cartilage.

periderm = specialised, impermeable epithelial cells covering the entire embryo after epiboly ends and representing the sole derivative of the enveloping layer.

perigean range = the average semi-diurnal range occurring at the time of perigean tides; larger than the mean range where the type of tide is either semi-diurnal or mixed and of no practical significance when the tide is diurnal.

perigean tidal current = a tidal current of increased velocity occurring monthly as a result of the moon being in perigee (nearest earth).

perigean tide = a tide of increased range occurring monthly as the result of the moon being in perigee (nearest earth).

periglacial = areas, objects or processes near the edge of a glacier.

perinasal groove = a cleft or groove around the nasal opening in Chondrichthyes. Also called circumnarial fold or groove.

period of catchability = the time when a given species is permitted to be caught.

periodic parasite = parasitic for part of its life cycle.

periodical = a publication issued at intervals; a serial.

periosteum = a sheath of connective tissue covering a bone.

peripatric speciation = populations isolated at the periphery of a species range may diverge morphologically and/or ecologically, eventually forming distinct species.

peripharyngeal groove = a ciliated groove around the inside of the pharynx connecting the hyperpharyngeal and hypopharyngeal grooves.

peripheral = the division of fishes that occurs in freshwater but which is very tolerant to salt water, e.g. Petromyzontidae, Acipenseridae, Anguillidae, Gobiidae.

peripheral isolation = the process that allows peripatric speciation, *q.v.*

peripheral nervous system = nervous structures such as ganglia outside the central nervous system.

periphyton = plants and animals adhering to parts of rooted aquatic plants.

periphyton collector = a fish that combs algae from plants without eating or damaging the plants.

periphytonophagy = feeding on periphyton.

perisopterygia = plural of perisopterygium.

perisopterygium (plural perisopterygia) = median fin (one of those fins located on the sagittal plane of the body, the dorsal, caudal and anal fins).

peristaltic pump = a dosing pump for aquaria which works by using rollers to squeeze flexible tubing.

peritonea = plural of peritoneum.

peritoneal canal = a canal permitting the sperm to leave the body cavity in certain Teleostei.

peritoneal cavity = the coelomic cavity containing the viscera.

peritoneal membrane = peritoneum.

peritoneum (plural peritonea) = a membrane covering the body cavity (coelomic cavity) including the viscera. Often its color, light, speckled or black is of taxonomic significance. There are visceral and parietal peritonea, *q.v.* A black peritoneum may prevent luminescent prey from lighting up the stomach of deepsea fish, leaving them apparent to even larger predators.

peritroct = the area surrounding the anus; perianal region.

perivisceral cavity = coelom; the main body cavity.

perivitelline space = the fluid-filled space between the embryo and chorion of an egg. The width varies between fish groups and so can be used in identification.

permanent collection = specimens owned by a museum.

permanent current = a continuously running current independent of tides such as a river and the ocean currents.

permanent parasite = parasitic for its entire life cycle.

Permian = a geological period of the Palaeozoic ca. 290-245 million year ago. Abbreviated as P.

permit = a permit is a document giving the holder the right to operate in a fishery according to the terms established by the regulating authority. Also called a license.

permit stacking = cumulative limit stacking (the association of cumulative limits with permits rather than vessels. A vessel with multiple limited entry permits can harvest multiple cumulative limits. Also called permit stacking).

pers. comm. = personal communication. Used to document information received from another, as in a scientific paper.

pers. obs. = personal observation. Used to document information seen by the writer, as in a scientific paper.

persistence = the tendency of a population to continue to exist in the long term, despite short-term fluctuations.

personal best = the largest fish of a particular species caught by an angler. Abbreviated as pb, particularly in British fishing magazines.

personal communication = unpublished information communicated to the author verbally, or in personal correspondence. Abbreviated pers. comm.

personal flotation device = a life jacket or life vest used to support a person in the water and prevent drowning. Abbreviated as PFD.

personal observation = information or data obtained by the actions of the author. Abbreviated pers. obs.

pescaphile = presumably similar to pescophile; a name for a registered user on Flyfishing Forum web site.

pescatarian = a person who eats fish but not meat.

pescavore = a person who eats fish but not meat.

pesco-vegetarian = a person who eats fish but not meat.

pescophile = lover of fish (Time, Canadian Edition, 2 December 2002, 160(23):75). Not in any dictionary at this date! (and only 3 Google hits as of 24 May 2005; but more all the time).

pessoner = a fishmonger (archaic).

pet fish = an aquarium or pond fish kept as a pet, rather than for food or for scientific study.

peter man = a fisherman (archaic), presumably from St. Peter in the Bible. Used in England for those unlawfully fishing in the Thames River (archaic).

peter-boat = a fishing boat with a sharp bow and stern for quick handling; from peter man.

Peterson method (of aging) = the calculation of age by the size distribution of a population.

Petersen tag = a tag composed of two plastic discs fastened by a pin through the back muscles of a fish.

petfish = pet fish.

petite = bite (a small piece of fish breaded or coated with batter, weighing less than 1 oz. Of various shapes such as round, square, or irregular. May be cut from regular blocks or blocks of minced fish. Generally sold by count, 25-35 per lb. Also called cubes, nuggets, and tidbits).

petrosal = the old term applied to otic bones, the pterotic.

pettie = patie.

pew (noun) = 1) fish fork with a long stick handle and a sharp prong or tine affixed to its end. Used to prong fish from the boat onto the fishing stage in Newfoundland.

pew (verb) = 2) the process of using a pew.

pewer = the person who handles the pew.

peyailack = 1) pelek.

peyailack = 2) the roe entire (Shetlands and Orkneys dialect).

pezac = a pilchard with a broken back; hence pezzacky meaning offish, poorly, sickly (Cornish dialect).

pezzack= pezac.

PFD = personal flotation device.

Pfiesteria = a toxic dinoflagellate, *Pfiesteria piscicida*, implicated in lesions on fish and in major fish kills both in aquaculture and the wild. Warm water, high nutrient levels and low dissolved oxygen levels appear to favour the development of this dinoflagellate which becomes toxic in

the presence of fish schools. The trigger for toxicity may be fish secretions or faeces. This toxicity is controversial and still under investigation.

pH = a measure of how acidic or alkaline a solution is, i.e. the concentration of hydrogen ions in a solution (log to base 10 of the reciprocal of the hydrogen ion concentration). pH 7.0 is neutral, lower values are acidic and higher values are alkaline. Acid rain decreases the natural pH of rivers and lakes. Some fish require a specific pH, others will live at wide range of values: the general range for fish is 6-9. The internal pH of a fish falls after death but rises as amines are formed during spoilage.

pH controller = a device used to control the pH of the aquarium through the addition of carbon dioxide to the system.

phaenotype = phenotype.

-phagous (suffix) = feeding on, eating.

phantom nomen = a scientific name accidentally published in an amateur publication without a proper description.

phantom reference = a reference cited in a published work as in preparation or in press but which is never subsequently published.

phantom taxonomy = a name for the trend to include taxonomic information from phylogenetic studies in on-line appendices in order to save space. These risk rejection by the International Code of Zoological Nomenclature or may simply be ignored.

phantom trawl = a form of pelagic or midwater trawl.

pharotaxis = moving towards a place in response to a learned or conditioned stimulus.

pharyngeal = pertaining to the region of the pharynx.

pharyngeal apophysis = the apophysis in Cichlidae that supports the upper pharyngeals comprised of elements of the parasphenoid, basioccipital and prootic or only the parasphenoid. Probably of little value in assessing relationships.

pharyngeal arch = a segment of the lateral wall of the pharynx that will form jaw and gill structures. The anterior two arches form jaw structures and the following 5 arches form gill structures. Each arch is separated from its neighbours by an endodermal outpocketing or pharyngeal pouch which meets an ectodermal inpocketing or pharyngeal cleft. Between the second and last arches the gill slits develop during the hatching period.

pharyngeal bar = branchial bar (the vascularized cartilaginous bars serving as gills in Amphioxus).

pharyngeal jaw = fused left and right fifth ceratobranchial bones, e.g. in Cichlidae, Embiotocidae, Labridae and Pomacentridae. The suture may leave no trace and have teeth over the symphysis.

pharyngeal mill = molar teeth in the pharyngeal region used to crush shellfish, e.g. in Sparidae; in Poeciliidae the roof plates in the throat are on pharyngobranchials 2-4 and the floor plates are on ceratibranchials 4 and/or 5.

pharyngeal organ = diverticulum pharyngealis (epibranchial organ (a paired dorsal diverticulum at the posterior limit of the pharynx in certain microphagous fishes. Also called gill-helix, pharyngeal organ, or pharyngeal pocket. In all forms with these organs, except some characids, prominent gill rakers extend into the organ dividing its cavity into two parts, one confluent with the pharynx, and one with the opercular cavity. Small food particles, generally plankton, are retained by the rakers, consolidated by mucus and squeezed out into the oesophagus. Found in Heterotidae, Characidae, Chanoidei, Gonorynchoidei, Clupeidae and Engraulidae)).

pharyngeal pad = the covering of the pharyngeal process against which the pharyngeal teeth grind food.

pharyngeal pocket = an outpocketing of the gill cavity in certain teleosts (having different origin). Functioning as accessory digestive, sensory (?) organs, e.g. *Dorosoma* (Clupeidae), Ophiocephalidae, *Heterotis* (Osteoglossidae), Anabantidae.

pharyngeal process = a large posterior expansion of the basioccipital above the pharyngeal tooth plates of the fifth ceratibranchials in Cyprinidae and related fishes.

pharyngeal sac = the paired toothed pockets projecting laterally from the gullet immediately behind the last gill arch in most Stromateoidei.

pharyngeal teeth = teeth on the pharyngeal bones. May be placed in a dorsal and ventral pair, as in most teleost fishes, or in laterally opposing pairs, one set on each side, as in Cyprinidae and Catostomidae. The upper pharyngeal teeth are located on a dentigerous plate on the fourth pharyngobranchials and the lower pharyngeal teeth on the dentigerous plate on the fifth ceratibranchials. The pharyngeal teeth of minnows and suckers are processes on the dentigerous plate of the fifth ceratibranchials and are thus homologous to the lower pharyngeal teeth of other fishes; these oppose a prominent horny pad which rests on a projection from the basioccipital.

pharyngeal tooth count (or tooth formula) = pharyngeal tooth counts (of Cyprinidae) are presented in a formula from the outer to the inner rows of the left arch, then the inner to the outer rows of the right arch, e.g. 2,5-4,2 means 2 teeth in the outer and 5 teeth in the inner row of the left arch and 4 teeth in the inner and 2 teeth in the outer row of the right arch. If variation in the outer row occurs it may be written as 1 or 2, 5-4, 2 or 1; or as 2,5-4,2 or 1,5-4,1. Periods and colons are sometimes used to separate the inner and outer rows; 1.4-4.1; 1:4-4:1. The third row, if present, is placed at the beginning and end of the formula 1,3,4-4,2,1. There may be no teeth in outer rows, e.g. 5-4. As there is only one row on pharyngeal arches of Catostomidae usually the count of only the left arch is given.

pharyngobranchial = the deep, endochondral bone at the top of the gill arch. May bear the upper pharyngeal and a dentigerous plate. May occur on arches 1, 2, 3, 4. Also called super-pharyngeals or superior pharyngeals. Suprapharyngobranchials are never associated with teeth while infrapharyngobranchials may be associated with dermal plates bearing teeth.

pharyngognathus = having lower pharyngeals united.

pharyngula = an embryo that has developed to the phylotypic stage.

pharynx = the portion of the intestine between the mouth and the oesophagus, or the oral cavity posterior to the mouth if it is distinguished and the oesophagus

phase type = an unofficial term in nomenclature for a type showing a different phase from the holotype, e.g. different sex.

phena = plural of phenon.

phenetics = classification based on grouping by overall similarity, not recency of common descent.

phenology = the study of the timing of recurring biological phases, the causes of their timing with regard to biotic and abiotic forces, and the interrelation among phases of the same or different species.

phenols = chemicals in wood smoke used in smoking fish, mainly responsible for retarding bacterial activity.

phenome = the phenotype as a whole, not as manifested by a specific genotype.

phenon (plural phena) = a group of phenotypically similar organisms (the numerical taxonomy equivalent of taxon; may be a taxon).

phenotype = the observable structural and functional properties of an organism, produced by the interaction between the genotype and the environment.

phenotypic = adjective for phenotype.

pheromone = a chemical secreted by an organism which affects the behaviour of others of the same species.

philopatry = the tendency of an individual to stay in its birth site, home area or other locality, or to return to such areas. This condition is opposed to dispersal or roaming behaviour; both are found in fishes.

-philous (suffix) = loving or thriving in.

phinnick = finnock (immature sea trout, *Salmo trutta* (Scottish dialect). Also spelled finnack, finneck, finnoch, and phinnock).

phinnock = finnock (immature sea trout, *Salmo trutta* (Scottish dialect). Also spelled finnack, finneck, finnoch) and phinnick).

phish = pronounced fish, an American rock band founded in Vermont playing an eclectic mix of rock, jazz, bluegrass, heavy metal, blues, progressive rock, acoustic, and classical.

phishing = pronounced fishing; identity theft by false representation in an email which requests personal information. While many people ignore this, some people take the bait as fish do in real fishing.

-phobic (suffix) = intolerant of, lacking affinity for.

phoneses = a temporary attachment of one animal to a faster one, e.g. in remora fishing (a captured remora is released from a boat with a line attached through its tail or to a ring through the tail. The remora then attaches to a turtle or shark which can be pulled to the boat) (von Brandt, 1964).

phosphorescent organ = an obsolete term for photophore, *q.v.* The basis for light production is not phosphorescence so this is a misnomer.

photic zone = surface waters where there is enough light for photosynthesis.

photo-engraving glue = a glue made from fish skins, with an added preservative to prevent bacterial growth. Used as a coating on colour television picture tubes.

photocyte = light-producing cell.

photogenic = light producing.

photogenesis = light production.

photographotype = a prototype.

photoperiod = the length of sunlit portion of the day, which changes seasonally and latitudinally. Also refers to the lighting regime set up for an aquarium or for an experiment.

photophore = a light-producing organ. Light may be produced from compounds produced by the fish itself or from prey it has ingested, or by symbiotic bacteria. The organ may be simple or variously equipped with reflectors, lenses, shutters, etc., e.g. in Myctophidae, Gonostomatidae, Batrachoididae. Various abbreviations are used for light organs in descriptive works, e.g. AC, Ant, AO, AOa, Aop, BR, Dn, IC, IV, OA, OP, ORB, PLO, PO, Pol, Prc, PVO, SAO, So, SO, VAV, Vn and VO.

prototype = iconotype (an illustration on which a new species or subspecies was based). Iconotype is preferred. May be merely a photograph of the type.

phrase name = 1) a polynomial.

phrase name = 2) an element in a taxon label (*q.v.*).

phreatic = of or relating to ground water.

phreatic surface = water table (top of the zone of saturation).

phthitic = shrinkage and wastage of an organ.

**PhyloCode** = a phylogenetic Code of biological nomenclature. Principles and rules governing the naming of taxa and application of taxon names based on the principles of common descent.

**phylogenetic definition** = a statement explicitly linking a taxon name with a particular clade.

**phylogenetic hypothesis** = an hypothesis on the relationships of taxa based on a common ancestry.

**phylogenetic specificity** = closely related fish parasites which are found on phylogenetically related hosts. Compare physiological specificity.

**phylogenetic system** = in nomenclature, the principles and rules which cover the naming of taxa based on common ancestry.

**phylogenetic systematics** = the study of systematics aiming to infer the phylogeny of the organisms investigated. In a more restricted sense, the study of systematics using cladistics, *q.v.*

**phylogenetic tree** = a branching diagram or tree showing phylogeny with the minimal number of connections.

**phylogeny** = the evolutionary descent and interrelationships of a group of organisms; an evolutionary history.

**phyogeography** = relationships between gene genealogies (phylogenetics) and geography.

**phylotypic stage** = the stage at which an embryo develops characters defining it as a vertebrate or chordate such as the notochord, neural tube, pharyngeal arches, somites and postanal tail.

**physiological specificity** = fish parasites, not necessarily closely related, restricted to certain hosts by having similar physiological factors for development.

**physoclist** = a species having the the gas bladder closed, with no connection to the gut. There is supposedly a connection in larvae to allow for first inflation. Adult fish must secrete gases against a pressure gradient using a gas gland and rete mirabile. The gas gland secretes lactic acid into the blood, causing a decrease in pH which results in haemoglobin releasing oxygen which diffuses across the rete. An organ known as the oval body is the re-absorbent organ when the partial pressure of gases in the swim bladder is greater than that of the dissolved gases in the blood.

**physoclistous** = having the gas bladder closed, with no connection to the gut.

**physostome** = a species having the gas bladder connected by a tube to the gut.

**physostomous** = having the gas bladder connected by a tube to the gut.

**phytobenthophagous** = eating plant food from bottom sediments.

**phytolithophil** = a reproductive guild (*q.v.*) of a non-obligatory plant spawner characterised by adhesive eggs scattered on submerged objects, late hatching, cement glands in free embryos,

showing photophobia, and moderately developed respiratory structures, e.g. *Perca flavescens* (Percidae).

phytophagy = plant eating; herbivorous.

phytophil = 1) a reproductive guild (*q.v.*) of an obligatory plant spawner characterised by an adhesive egg envelope sticking to submerged plants (both live and dead), by late hatching, cement glands, by not being phototactic, and by having very well developed embryonic respiratory structures, e.g. *Cyprinus carpio*.

phytophil = 2) a reproductive guild (*q.v.*) of adhesive eggs attaching to aquatic plants but tended by the adult. Extended embryonic period, free embryos without cement glands swim instantly, e.g. *Pomoxis annularis* (Centrarchidae).

phytophil = 3) a reproductive guild (*q.v.*) of adhesive eggs attaching to plants in a nest with the embryos hanging onto the plants by cement glands. Embryos have well-developed respiratory structures but are also fanned by the parents, e.g. *Amia calva*.

phytoplankton = plant plankton; minute, floating aquatic plants.

phytoplanktophagy = feeding on phytoplankton.

piabas = local term for aquarium fishes captured in the Amazon basin.

pick = 1) an unsuccessful oral grasp, *q.v.*

pick = 2) to separate male from female capelin (*Mallotus villosus*) in a fish-processing plant (Newfoundland).

pick = 3) a gaff used in sea fishing.

pick = 4) an eel spear.

pick = 5) a fisherman's heading knife.

pick-up = clems (fish and potatoes fried together (Cornish dialect)).

pick-up and lay-down = a fly fishing cast using only a single back cast followed by a forward cast onto the water.

picarooner = a small herring-fishing boat (Devon, England).

picker = 1) a young fish, such as a cod too small to swallow bait (Scottish dialect).

picker = 2) a person cleaning and preparing fish industrially.

pickerel = a common name used by anglers for walleye (*Sander vitreus*, Percidae) but strictly speaking the name for the smaller species of the pike family, Esocidae Pickerel is the Middle English for a small pike.

picket = a hook attached to the end of a small stick and used by fishermen in landing their fish (Northumberland dialect).

pickie = a wooden pole, furnished with a strong iron hook, used for striking fish into the boat (Shetlands and orkneys dialect).

pickle = 1) a mixture of brine and the body fluids of fish extracted by the brine. Also called brine pickle, brine liquor.

pickle = 2) to steep in pickle or brine.

pickle cured fish = fish treated with salt in a watertight container such that they are cured in the resulting pickle drawn out from the flesh by the salt.

pickle salted fish = pickle cured fish.

pickled fish = 1) fish that have been pickle cured.

pickled fish = 2) fish preserved in scientific collections, usually first fixed in formalin and later transferred to ethanol for long-term storage.

pickled grainy caviar = caviar immersed in a saturated salt brine pickle before packing.

pickled herring = 1) gutted herring, dry salted in barrels and allowed to cure in the resulting pickle.

pickled herring = 2) a buffoon (slang).

pickled salmon bellies = Pacific salmon ventral sections hard salted in pickle. Also called salmon bellies.

pickled salted fish = pickle cured fish.

pickling = 1) making a pickle.

pickling = 2) buckling (a large fat herring, sometimes headed, lightly salted and hot smoked).

pico reef = a small marine aquarium of less than 3 gallons. Cheaper than larger setups but difficult to maintain and very restricted in the fishes it can support. The smallest version of the nano reef, *q.v.*

pie = a fish pie comprises minced fish baked with potatoes, and sometimes mixed with vegetables, in a pastry.

piebald = with two colours irregularly arranged, usually black and white.

pieces = individual fish.

pier = a narrow platform providing access from the shore to deeper water for landing or as a recreational facility. May be floating or fixed on pilings built out into the water but usually of open construction. Often used for fishing.

pier fishing = catching of fish from artificial structures raised out of the water on supports. These structures often form good habitat for fishes.

pier rat = a fisherman (mostly men) who spend inordinate amounts of time on large piers waiting for fish to bite, even sleeping there and developing their own customs.

piesmotype = an unofficial term in nomenclature for an illustration prepared from a plate with an imprint made mechanically from a merotype (*q.v.*).

pig catcher = madrague (a trap used for tuna in the Mediterranean Sea).

pigeon droppings = dried and powdered these are used in groundbaits in Europe especially for roach (*Rutilus rutilus*).

pike = *Esox lucius*, said to be the only fish that did not dive underwater at Christ's crucifixion. It lifted its head and saw this event which is recognisable on its head, showing a cross, three nails and a sword.

pike bung = a large rounded float used to support a live or dead bait when fishing for pike (*Esox lucius*).

pike fly = a large artificial fly imitating a fish and used to catch pike.

pike fry rhabdovirus = a virus found in fry and fingerlings of northern pike (*Esox lucius*).

pike grey = a greyish colour like that of a pike.

pike pest = motile aeromonad septicaemia or bacterial haemorrhagic septicaemia (a bacterial infection with *Aeromonas liquefaciens*, *Aeromonas hydrophila* or *Pseudomonas* affecting fishes of all ages, usually in spring. Usually associated with stress and overcrowding. Haemorrhages occur in the skin, fins, mouth cavity and muscles. Exophthalmia and cavity ulcers may occur. Also called infectious dropsy, red pest, freshwater eel disease, and redmouth disease).

pike rod = a rod for pike fishing, about 3.7 m long with a test curve of 0.9-1.4 kg.

pike slider = a streamlined balsa or hollow plastic float with a hole through its length, sliding along the line until stopped at the desired distance from the bait by a bead and stop knot.

pike tube = a long mesh tube conforming to the shape of a pike and used to keep captured fish temporarily.

pikemonger = a person who sells pike and other freshwater fishes (obsolete).

pilchard = *Sardina pilchardus*, a member of the family Clupeidae and an important food fish. Many terms were associated with the fishery for this species, particularly in Cornwall in

southwest England. These terms in Cornish dialect are now archaic. The season in Cornwall lasts from June until the following March, and is carried out by fishing boats, regulated by size. Traditional drift or ring nets with a species specific mesh size are fished for a few hours in the evening, icing the catch as it is caught, before landing later the same evening. See also sardine.

pile (noun) = 1) a stack of split and salted cod at various stages of the drying and curing process.

pile (noun) = 2) the motion of the water, caused by a fish when it rises to the surface (English dialect).

pile (noun) = 3) one of the heaps of sand used in the ancient Annan practice of casting the mell (*q.v.*) by which poke-net fishing rights in the Solway are allotted.

pile (verb) = 4) to place split and salted cod in a stack at various stages of the drying and curing process.

pile-builder = one who takes part in casting the mell (*q.v.*).

pileate (adjective) = having a cap.

pileus (noun) = a cap marking on the head.

pilger = an implement for catching eels; a three-pronged spear (British dialect).

pilik = pelek.

pilk = 1) jig (one to several bare hooks attached to a weighted line. The hook(s) may have a lead head (lead molded around the hook) and be dressed with, or have a skirt of, rubber, hair, silicone or plastic).

pilk = 2) to pull out of the water with a jerk.

pilk = 3) to remove a hook with a stick or disgorger.

pilk = 4) a gaff (*q.v.*).

pillow = polster.

pilly ground = a fishing term for alternate stretches of sand and rocks covered with sea-weed, under water (Cornish dialect).

piloting = swimming within the friction layer of a larger fish, thus reducing energy expenditure, e.g. from the pilotfish, *Naucrates ductor*.

pimple = wedge (a small, cut-out and lens-less portion of the pupil margin of the eye. This widens the field of vision and allows more light to enter the eye, rather than falling on the iris. Usually found antero-ventrally for improving forward vision. Found in a various species of salmonids and cyprinids, for example. Also called notch or notche. See also aphakic space).

pimple disease = knot disease (a disease characterised by small knots formed in the skin of fishes. Found in *Cyprinus carpio* and caused by the protozoan *Myxobolus exiguum*).

pin = to attach the snood of a fishing line to the main line (Scottish dialect).

pin bone = 1) a small, fine bone in the middle of fish fillets (intermuscular bones).

pin bone = 2) the rib bones remaining at the anterior end of a fillet from round white fish.

pin bone trimming = pieces cut out of a j-cut fillet (a cut made through a skinned fillet from the neck end of the fillet, dorsal to and along the line of the pin bones (q.v.) towards the last pin bone and then curving sharply down to the ventral edge of the belly flap (q.v.). Also called j-cuts.

pindang = un-gutted small fish or chunks of bigger fish, usually Scombridae, salted and boiled or steamed (Indonesia).

pine = 1) to dry or cure fish by exposure to the weather (Scottish dialect).

pine = 2) to shrink during curing (Scottish dialect).

pineal eye = median, eye-like structure on the top of the head in members of the Petromyzontidae, e.g., developing from the pineal organ.

pineal foramen = a small opening in the skull roof in the pineal plate of Placoderms and Agnatha and between the frontals in Osteichthyes - the "third eye".

pineal organ = the light sensitive dorsal evagination of the diencephalon part of the brain. See also epiphysial apparatus. This large and dark body lies to the right of the midline while its left side counterpart is the parapineal, not always present or reduced in some fishes. Secretes melatonin which is thought to be important in reproduction, migration and growth.

pineal shield = a set of bones covering the skull roof posterior to the intracranial joint in Crossopterygians.

pineapple disease = pinecone disease.

pinecone disease = dropsy (a swelling of the fish's body usually caused by bacterial infection, and also by viral infection, osmoregulatory problems, a flagellate protozoan (*Hexamita*), aggravated by poor environmental conditions. Serous fluid accumulates in any body cavity. Other symptoms are lethargy, gasping, increased respiration, colour loss, skin ulceration and exophthalmia. Also called vertical scale disease (and pinecone disease) because the scales stick out, and ascites).

pinger = a sound-emitting device. Attached to static nets to discourage dolphins and porpoises from their vicinity so that the mammals do not become entangled. Also called acoustic device.

pinhole camera eye = a teratological condition in which the size of the eye is reduced, the lens is absent and the pupil is very small, acting as a pinhole camera, e.g. observed in white crappie, *Pomoxis annularis* (Centrarchidae) and *Kurtus gulliveri* (Kurtidae).

pink fish = salted dry fish with halophilic bacterial growth causing a pink or reddish colour. The fish eventually turn brown and have a foul odour.

pinkstern = chebacco boat (a fishing vessel employed in the Newfoundland fisheries. The word may be a corruption of Chedabucto, a bay in Nova Scotia, from which vessels are fitted out for fishing or the same as the chebec).

pinna (plural pinnæ) = fin.

pinna abdominalis (plural pinnæ abdominales) = pelvic fin.

pinna adiposa (plural pinnæ adiposæ) = adipose fin (a small fleshy fin lacking rays or spines but reinforced by actinotrichs posterior to the soft dorsal fins (rarely a hard ray or a few soft rays may be developed in the adipose fin of certain catfishes), e.g. in Salmonidae, Osmeridae, Argentinidae, Myctophidae, Ictaluridae, Percopsidae).

pinna analis (plural pinnæ anales) = anal fin (the median ventral fin or fins behind the anus. Abbreviated as A, or A1 and A2 if there are two. Also called proctopterygium, it functions to maintain equilibrium against rolling).

pinna ani (plural pinnæ ani) = pinna analis.

pinna caudalis (plural pinnæ caudales) = caudal fin (the tail fin, aiding movement. Also called the uropterygium. The fin at the posterior end of the vertebral column (but in Centriscidae the hind end of the body rotates so that the caudal fin is ventral, and in some Trachipteridae the upper lobe of the caudal may be dorsal (the separate lower lobe may disappear). In other families, such as the Zoarcidae and Anguillidae, dorsal, caudal and anal fins are united and are externally indistinguishable. Abbreviated as C).

pinna cercalis (plural pinnæ cercales) = caudal fin.

pinna dorsalis (plural pinnæ dorsales) = dorsal fin (the unpaired fin(s) on the midline of the back. Also called the notopterygium. In Pleuronectiformes it is on the opposite side to the anus. In Centriscidae the hind end of the fish has been rotated under the fish so the dorsal fin is on the under surface. Abbreviated as D, D1, D2, or D3 respectively for the only, first, second or third dorsal fins (or their rays and spines). It functions to prevent rolling).

pinna impar (plural pinnæ impares) = median fin (one of those fins located on the sagittal plane of the body, the dorsal, caudal and anal fins. Also called perisopterygium).

pinna imparile (plural pinnæ impariles) = median fin (one of those fins located on the sagittal plane of the body, the dorsal, caudal and anal fins. Also called perisopterygium).

pinna mediana (plural pinnæ medianæ) = median fin (one of those fins located on the sagittal plane of the body, the dorsal, caudal and anal fins. Also called perisopterygium).

pinna parilis (plural pinnæ pariles) = paired fin.

pinna paris (plural pinnæ pares) = paired fin.

pinna pectoralis (pinnæ pectorales) = pectoral fin.

pinna ventralis (plural pinnæ ventrales) = ventral or pelvic fin, *q.v.*

pinnæ = plural of pinna.

pinnæ abdominales = plural of pinna abdominalis.

pinnæ adiposæ = plural of pinna adiposa.

pinnæ anales = plural of pinna analis.

pinnæ ani = plural of pinna ani.

pinnæ caudales = plural of pinna caudalis.

pinnæ cercale = plural of spinna cercalis.

pinnæ dorsales = plural of pinna dorsalis.

pinnæ impares = plural of pinna impare.

pinnæ impariles = plural of pinna imparile.

pinnæ medianæ = plural of pinna mediana.

pinnæ pariles = plural of pinna parilis.

pinnæ pares = plural of pinna paris.

pinnæ pectorales = plural of pinna pectoralis.

pinnæ ventrales = plural of pinna ventralis.

pinnate = feather-like, having parts arranged on each side.

pinner = a small mackerel (Scottish dialect).

pinnula = finlet (one of a series of small fins consisting of a few rays each, separate from each other and found posterior to the dorsal and anal fins, e.g. in Scombridae).

pinny = a fish which is just hatched (Yorkshire dialect).

pint = 568.26 cm<sup>3</sup> (Imperial, abbreviated as pt<sub>BI</sub>), 550.6 cm<sup>3</sup> (U.S. dry, abbreviated as pt, dry), 473.17 cm<sup>3</sup> (U.S. liquid, abbreviated as pt).

pinwiddie = a whole smoked haddock with its backbone retained, usually gutted and headed (Scotland). Initially cold smoked for several hours, then hot smoked. Also known as Arbroath smokie, Auchmithie cure, close fish.

pip = 1) the entrails of a fish.

pip = 2) to remove the gills and abdominal organs of a herring (Newfoundland).

pipe = extension piece (tapered sections of netting between the belly and the batings and the cod end of a trawl. Also called swallow piece, tail, tail piece, taper, Y-piece).

pipe trap = a trap associated with a weir on Japanese rivers. Two gravel dikes, parallel with the river flow, direct fish to a small weir, 30-40 cm high. A pipe just below the weir carries fish blocked by the weir to a holding tank or net just outside the gravel dike.

ipseys = pipsi.

ipseys = pipsi.

pipsi = cod and trout preserved by drying in the sun and wind without salt, an Inuit technique (Newfoundland).

piquoir = a sharp instrument used to spear and pick up fish in greenfishing, *q.v.* (Canada).

piracy = the action of a pirate stream.

pirate fishing = undertaken by large-scale fishing vessels registered under flags of convenience, the vessels being owned in one country but registered in another to avoid fisheries regulations. Not only are fish taken illegally but many seabirds are also killed incidentally by net entanglement, particularly albatrosses. See also white gold.

pirate stream = a stream that has captured the headwaters of another stream by deepening its valley more rapidly until it breached the divide between the streams.

pirn = the reel of a fishing rod (Scottish).

pirogue = a small, flat-bottomed boat often associated with West Africa and Louisiana, as well as other parts of the world. Small and light enough to be easily taken onto land, to move through very shallow water, and be easily turned over to drain water. Usually propelled by paddles that have one blade (as opposed to a kayak paddle, which has two). Can also be punted with a pole in shallow water. May have a small sail and/or an outboard motor.

piscage = 1) a fishing right (obsolete).

piscage = 2) payment for fishing rights (obsolete).

piscan = of or relating to fishes.

piscary = 1) the right to fish in another man's waters (legal). Also called common of piscary.

piscary = 2) a fishing place or fishing ground where fish may be caught.

piscary = 3) a fishery.

piscary = 4) a fish market.

piscary = 5) a fisherman.

piscary = 6) a fish monger.

piscation = fishing, fishery.

piscatology = the science of fishing; erroneously ichthyology.

piscator = a fisherman, an angler.

piscator non solum piscatur = there is more to fishing than catching fish; motto of the Flyfishers' Club.

piscatorial = pertaining to fishing or fishes or fishermen.

piscatorial pornography = pictures of large fish that anglers drool over (from "The Economist" 22 December 2007, online edition).

piscatorian = 1) a fisherman.

piscatorian = 2) piscatorial.

piscatorical = of or relating to fish; piscatorial.

piscatorius = that catches fish; a humorous nickname for an angler.

piscatory = 1) of or pertaining to fish or fishing or fishermen.

piscatory = 2) living by or given to fishing.

piscean = 1) one born under the zodiacal sign Pisces.

piscean = 2) relating to fish (presumably a misuse of the above).

Pisces = 1) fishes, the twelfth sign of the zodiac represented as a fish.

Pisces = 2) a southern constellation.

Pisces = 3) a class of vertebrates, no longer in use.

Pisces = 4) a general term for fishes.

pisci- (prefix) = pertaining to fish, from the Latin *piscis*, fish.

piscian = 1) a fish (noun; presumably a misuse of piscean (1).

piscian = 2) relating to fish (adjective; presumably a misuse of piscean (1).

pisciculture = the catching of fish.

pisciculturist = one who catches fish, fisher.

piscicidal = adjective for piscicide.

piscicide = 1) extermination of fish.

piscicide = 2) an agent used to exterminate fish. Plant extracts are widely used around the world and are usually alkaloids. There are thousands of plants used in capturing fish, either as the whole plant, as bark, leaves, roots stems, pods, fruits and seeds, often crushed or fermented.

piscicle = a little fish.

piscicolous = parasitic on fishes.

piscicultural = adjective for pisciculture.

pisciculture = the artificial rearing of fish.

pisciculturist = a specialist in fish culture; superintendent of a fish hatchery.

piscifauna = a fish fauna; fish life of an area. The synonym ichthyofauna is more generally used.

pisciform = fish-shaped.

*piscina* = 1) a Roman pond for fishes.

*piscina* = 2) a pond or other facility for bathing or swimming, e.g. the swimming venue at the 2000 Olympic Games.

*piscina* = 3) a stone basin used in church services for carrying away the water used in rinsing the chalice and the hands of the priest.

*piscina dulcis* = a Roman freshwater pond for fishes, more plebeian than marine ones.

piscine = 1) of or pertaining to fish.

piscine = 2) a pond or pool, used for bathing.

piscine erythocytic necrosis-associated virus = a virus found in Atlantic cod and other marine species associated with erythrocytes; possibly an iridovirus and relationship to piscine erythocytic necrosis unknown.

piscine tuberculosis = myxobacteriosis (a disease of fish caused by any member of the Myxobacteria, e.g. coldwater disease, columnaris disease, fin rot, peduncle disease, etc.).

piscinity = the quality or state of being a fish, fishiness or fishhood (humorous).

piscocephalic = having an overwhelming ego and thus leaving oneself open to ridicule. From an African saying "The fish whose head gets too large swims with his tail out of the water."

pisciponic system = a recirculating fish culture system.

piscis = Latin for fish, and the basis for many fish words.

Piscis Australis = Pisces Austrinus.

Piscis Austrinus = the Southern Fish, a constellation in the southern autumn sky. Represents the Babylonian fish-god Oannes (*q.v.*) and was sacred to the Egyptians. Also called Piscis Australis. See also Fomalhaut.

Piscis Volans = flying fish, a southern hemisphere constellation of stars.

piscivore = a feeder on fish.

piscitarian = fish monger (obsolete).

piscivorous = fish-eating or subsisting on fish.

pisculent = abounding in fish, full of fish.

pisiform = pea-shaped, the size of a pea.

pissala = variety of garum (*q.v.*) made in Nice, France.

piston cartilage = a retractable cartilage support of the three lingual laminae in Petromyzontiformes enabling a rasping action.

pistris = a sea monster sent to devour Andromeda. Usually depicted with a dragon's head, the neck and head of a beast, fins for the forelegs and the body and tail of a fish. In Christian art, the pistris was usually employed to represent the whale which swallowed Jonah. Also spelled pistrix, pristis or pristix.

pistrix = pistris.

PIT = pit tag.

pit = 1) a deeper hole or sump in a fish pond where fish gather and can be caught.

pit = 2) an area excavated for gravel, sand or other materials and later naturally filled with water; often stocked for fishing.

pit lines = the series of dimples left on bones or fossil bones by the overlying lateral line.

pit organ = a neuromast set in a small depression in the skin, not enclosed in a lateral line canal.

pit tag = passive integrated transponder. Also spelled PIT.

pitch = to fish with a boat and a pitchin net (English dialect).

pitchin net = a large triangular net attached to two poles, and used with a boat to catch salmon. The boats are flat-bottomed, about seventeen feet long, about four feet and a half wide, and pointed at both ends. They can easily be managed by one person and rarely overturn (English dialect).

pitching = underhand pendulum method of casting when fishing to avoid tree limbs of to deliver bait to a particular spot. Similar to flipping, *q.v.*, but not as stealthy and done from further distances.

pitfall trap = a hole dug into the ground to trap fish migrating overland. Seen in Myanmar and China.

pithing = killing a fish by means of inserting a sharp object into the brain.

pituitary gland = the endocrine gland located below the diencephalon just posterior to the crossed optic nerves. It controls the thyroid and interrenal gland, the gonads, growth, protein and carbohydrate metabolism, and chromatophore concentration and dispersion.

pizza and caviar = an unlikely combination offered on the ski slopes of St. Moritz to cater to Russian visitors.

pizza fish = anchovies (*Engraulidae*) used as a topping on pizzas. Rather strong-tasting and not always favoured.

pjelek = pelek.

PKD = proliferative kidney disease (a temperature-dependent disease of salmonids caused by a myxosporean protozoan causing gross changes in the kidney).

pl. = abbreviation for plate (3).

Pl. = abbreviation for plate (3).

pla thu nung = gutted fish, salted and then boiled in saturated brine (Thailand).

pla-ra = headed, gutted fish or pieces of fish salted and then fermented (Thailand).

place names = many geographical localities are based on fish, using this and related words in English. There are also many place names in other languages based on fish, e.g. and *q.v.* Fishguard, Iqaluit, *Oxyrhynchus*, Siskowit, Tippecanoe. Self-evident names are Alewife, Boston; Big Salmon, Yukon; Carp, Ontario; Catfish Paradise, Arizona; Fishkill (New York although here kill

probably means stream); Herring Neck, Newfoundland; Herringfleet (Suffolk); King Salmon (Alaska); Little Salmon, Yukon; Poissant (= fish), Québec; Salmon Arm, British Columbia; Trout (Kentucky).

placenta = a close association or fusion of maternal and foetal tissues for feeding and physiological exchange, e.g. in Poeciliidae.

placental matrotrophy = nutrients provided directly via a placenta in endogenous feeding, q.v.

placentotrophic live bearer = a reproductive guild (q.v.) where eggs, embryos and juveniles develop within the maternal reproductive system. Food and gas exchange is via a yolk sac placenta, a buccal and branchial placenta, or follicular and trophataenial placenta, e.g. *Sphyrana tiburo*.

placentrotrophy = nutrient transfer via a placenta.

placode = a thickened or plate-like region within an epithelium.

placoid scale = a type of scale, typically thorn-shaped, found on the skin of Elasmobranchii and claspers of Holocephali. Consists of a spine and a basal plate which is usually rhomboidal. It contains a pulp cavity and is composed of an inner layer of dermal bone, a middle layer of dentine and is covered by enamel-like vitrodentine. Also and less preferably called denticle, dermal denticle or odontoid.

plaice = flatfishes of the righteye flounder family (Pleuronectidae). The word comes from a Greek root meaning flat. Plaice is both singular and plural and plaices is seldom used.

plaice mouth = having a mouth like a plaice, i.e. wry or pursed.

plain = uniformly coloured or unadorned with structures.

plaited = folded longitudinally.

planer = a flat metal device attached to a troll line such that it dives or planes downward with the baited hook; lighter than downrigger cannonball (q.v.).

plank cooking = baking a fish in an oven or roasting it over open flames or coals while it is attached to a plank. The natural oils and moisture from the plank season the fish. Pre-cut planks are now available and can be used on barbecues.

planked shad = a split American shad (*Alosa sapidissima*) traditionally nailed to a plank and baked in the radiant heat from the coals of a fire.

plankter = an individual planktonic organism.

planktivore = consumer of plankton.

plankton = small aquatic organisms with weak locomotory powers living above the bottom. Fish eggs and larvae are often planktonic and some adults are. Opposite of nekton.

plankton feeder = planktivore.

plankton net = a fine-meshed net used to catch plankton and larval fishes.

plankton rain = the gentle falling of dead plankton from surface waters into the deeper part of the sea or a lake where they form food for other organisms, including fish directly or indirectly. Also called marine snow.

planktonivorous = plankton feeding.

planktophagy = feeding on plankton.

plant = a specific area of the Newfoundland foreshore with structures upon it for the landing and curing of fish. See also plantation.

plant eater = a fish feeding on higher aquatic plants or phytoplankton.

plantation = fishing room (a lot on a beach used as a base by fishermen and where drying of the catch is carried out (Newfoundland)).

planter = 1) a fisherman and owner of a fishing room or plantation and a boat in Newfoundland. Supplied by a merchant, he engaged a fishing crew.

planter = 2) a migratory fisherman from Newfoundland who conducts summer fishery from a station, room or harbour on the coast of Labrador.

planter = 3) a log lodged in the river bed with the other end at or below the water surface, dangerous to boats. See also deadhead.

planter fishery = the fishery carried out by planters (2).

planting = the addition of eggs, young or adults of a species of fish to a body of water by humans.

plaque = 1) a small flat formation or area.

plaque = 2) the bony covering of lateral line scales in Paralepididae.

plara = headed, gutted fish or fish pieces salted and then fermented. Made in India.

plash = to break the water surface.

plastic = skirted, brightly-coloured baits containing a large hook, trolled at high speed for such fish as marlin.

plastic worm = a plastic, flexible, and coloured worm with hooks.

plasticity = variation in form, ecology or behaviour, e.g. phenotypic plasticity.

plastotype = an unofficial term in nomenclature for an artificial specimen moulded directly from a type (used for fossils).

plate = 1) any flattened structure, usually an external armament in certain fishes.

plate = 2) the flattened part of the shank of a hook.

plate = 3) an illustration in a book, usually filling a whole page. May be a drawing or a photograph, in colour or in black and white, and may be divided into separate elements usually called figures and numbered or labelled sequentially.

plate freezing = freezing of fish product between two hollow plates with refrigerant flowing through them. The plates also compress the fish so that freezing is uniform.

plate-gill = a gill with laminae in Elasmobranchii and Holocephali.

plateau = flat or nearly flat area of considerable extent, dropping off abruptly on one or more sides. Includes undersea features of this form.

platelet = former name for loculus (one of the minute subquadrate bead-like elements forming the circuli in scales of Anguilliformes) or small plate-shaped segments of bone in some Gobiidae.

platform reef = a large reef of variable shape lacking a lagoon, seaward of a fringing reef and/or a barrier reef, for which the width is more than half its length.

platybasic skull = a skull with widely separated trabeculae, e.g. in *Amia*, *Polypterus*, *Acipenser*, Cypriniformes. The skull is dorsoventrally flattened, generally broad, lacks an interorbital septum, and the brain extends up to the ethmoid. Also called platytrabic.

platytrabic = platybasic.

play-ground = a tract of water at an estuary in which salmon may not be caught.

playa = a low, flat area in an arid or semi-arid region underlain by lacustrine sediments deposited in periods of higher precipitation than prevailing at present. May be covered in water in periods of high rainfall or runoff.

playing fish = in angling, the fighting of a hooked fish. This may be extended and necessary to land very large fish or deepwater fish to avoid narcosis. Care should be taken to avoid excessive playing as lactic acid buildup can be fatal.

PI\*co = an internet urban legend or superstition which maintains that if Pleco (for *Hypostomus plecostomus*, a suckermouth catfish, Loricariidae) is spelled correctly, then the aquarium pet will soon die - hence the asterisk.

plectospondylus = fishes with the anterior 4 or 5 vertebrae modified into ossicles connecting the gas bladder with the inner ear in Cypriniformes and Siluriformes.

pleio- (prefix) = more.

Pleistocene = a geological epoch of the Quaternary Period ca. 1.6-0.01 million years ago.

Plenary Power = the International Commission on Zoological Nomenclature is empowered by use of its Plenary Power to prevent the application of a rule of the International Code of Zoological Nomenclature where such application in a particular case would disturb the stability or universality or cause confusion in zoological nomenclature.

plenty more fish in the sea = many other possibilities; said when current ones unsuitable or unsuccessful. Applied to people, things and situations.

plenum system = Jaubert plenum (a natural method of filtration for a reef tank using a plastic grid (called an egg-crate) to suspend a thick (8-10cm) layer of coral or aragonite sand above a 2 cm water-filled void called the plenum. The system helps in lowering of nitrate through the presence of denitrifying bacteria deep within the bed).

pleo- (prefix) = multiple, excessive.

pleomorphic = variable in size, form and shape.

pleonasm = in nomenclature the use of generic names and specific epithets which are identical or similar in meaning, or are different words having identical or similar meaning.

plesiogenotype = a specimen provisionally included in a genus at the time of description but which was subsequently designated as the type of that genus.

plesiomorphy = an ancestral character state; the state from which an apomorphy is derived; usually and correctly applied to a specific character and not to a taxon. Note that derived states need not be more complex than plesiomorphic states and so the plesiomorphic state should not be referred to as primitive.

plesion = a group consisting of a series of successive branches from a stem lineage united by plesiomorphies or homoplasies, a paraphyletic group.

plesiotype = 1) a specimen identified by a subsequent author as belonging to a particular species or the same as a type.

plesiotype = 2) a specimen related to the type specimen but from another biological province or geological formation.

plesiotype = 3) a described or figured specimen which has been compared with the type specimen or original figure.

plesodic = said of a cartilaginous pectoral fin where ceratotrichia, *q.v.*, reach the border and offer better support than in the aplesodic fin, *q.v.*

pleural rib = pleuroperitoneal rib.

pleurethmoid = parethmoid (a paired deep bone of perichondral origin lying in the front of the orbit under the prefrontal. Also called prefrontal, exethmoid and, incorrectly, ectethmoid as this latter is only in birds).

pleurocentra = with two intercentra, the two pleurocentra unite to form the centrum of a vertebra. The pleurocentrum is formed between adjacent myomeres while the intercentrum is formed in the centre of a single myomere.

pleurodont = teeth implanted in the side of a bone, e.g. in Scaridae and Balistidae.

pleuroperitoneal cavity = the peritoneal cavity if lungs are also present along with the viscera.

pleuroperitoneal rib = a rib lying just outside of the body cavity, articulating with the parapophysis of the vertebrae and protecting the viscera. Also called ventral rib.

pleurosphenoid = misnomer for pterosphenoid, *q.v.*, since it is not homologous with the reptilian pleurosphenoid.

pleurostyle = the upturned strut in the tailfin skeleton of Cluapoidei, Gonorynchiformes and Cypriniformes, composed primarily of uroneurals rather than centra, unlike the typical teleostean urostyle made up of upturned caudal centra.

pleuston = 1) organisms living in the thin surface layer at the air-water interface in fresh water.

pleuston = 2) plants floating on the surface of fresh water bodies.

plica (plural plicae) = a small fold in the skin, e.g. diagonal skin folds along the side of *Ammodytes*.

plicae = plural of plica.

plicate = having plicae or a series of folds, grooves or wrinkles in the skin; plaited.

plication = a series of small folds or pleats.

Pliocene = a geological epoch within the Tertiary Period ca. 5-1.6 million years ago.

pliogenotype = an unofficial term in nomenclature for the type of a generic name which is a synonym of an earlier generic name.

PLO = a photophore above the base of the pectoral fin in Myctophidae.

plonger = plunger.

plosher = 1) a small coble (*q.v.*) used in herring fishing.

plosher = 2) a half-grown bream (unclear on which species this is, possibly the cyprinid *Abramis brama*).

plotolysin = the haemotoxic fraction of the catfish poison plototoxin, *q.v.*

plotospasmin = the neurotoxic fraction of the catfish poison plototoxin, *q.v.*

plototoxin = the poison derived from the catfish *Plotosus lineatus* (Plotosidae).

plucked = said of fish broken or injured, e.g. herrings removed from a net but stuck so fast that they cannot be shaken out but have to be plucked by hand, pulling their heads off.

plug = a fishing lure resembling a fish made of wood, plastic or metal with treble hooks attached. Available in many sizes, shapes, colours and actions and may be jointed or unjointed. Also called crank bait, jerk bait, minnow.

plugging = a nineteenth century "sport" of boys where a cork was affixed to the dorsal spines of fish. The fish dives but the cork brings it back to the surface.

plum-bob = the float of a fishing line.

plumb = a lead weight on a line, using for measuring water depth.

plumb line = plummet (1).

plumb the depths = 1) using a plumb.

plumb the depths = 2) to sink in misfortune or unhappiness.

plumbeus = lead colored; dull bluish grey.

plume = water, often turbid, beyond its usual confines, e.g. a river plume beyond the estuary or river channel.

plummet = 1) a cone-shaped lead weight with a loop at the top and a cork base. A hook at the end of a fishing rig is threaded through the loop and embedded in the cork. The rig is cast out and the plummet takes it to the bottom. The position of the float can be adjusted so that just its tip is visible above the water surface. The plummet is then removed and the rig fishes on the bottom.

plummet = 2) a metal weight with barbed points used to pierce flatfish lying on the sea bed.

plunge basket = cover pot (a wide-mouth basket with a smaller hole in the opposite end, plunged into the water over a fish spotted by a wading fisher, the fish being caught and extracted by hand through the smaller hole. Often used in turbid water or areas of rich plant growth. See also lantern net).

plunge pool = a basin scoured out by a waterfall.

plunger = a long shaft used in fishing with a trammel net. The shaft is plunged into the water to scare fish into the net (English dialect).

pluricuspid = tooth with many cusps or points.

pluriserial = arranged in two or more rows. Also pluriseriate.

pluriseriate = pluriserial.

plurivorous = feeding on a variety of different foods.

plus class = plus group.

plus group = the last age or size class which includes all the larger or older individuals than the nominal number of the class, e.g. 3+ is all individuals aged three years or more. Also called plus class.

pluvial = referring to a time period when precipitation is high and evaporation low, streamflow is strong and lake levels are high.

pluviotype = a joke name in nomenclature for a type specimen encrusted in silt after a flood.

PM = abbreviation for preoperculo-mandibular canal.

pm or p.m. = *post meridiem*, for after noon indicating time after 12.00 noon.

P<sub>MAX</sub> = the probability of re-building a fish stock by T<sub>MAX</sub>. A higher P<sub>MAX</sub> probability is associated with a lower fishing mortality rate.

pneumatic artery = a branch of the coeliac artery that serves the swimbladder and anterior dorsal mesentery.

pneumatic duct = a tube connecting the pharynx to the gas bladder; ductus pneumaticus. Open in some fish, closed in others.

PO = a row of photophores on the breast in front of the pelvic fin in Myctophidae.

poach = 1) to catch and take away fish illegally.

poach = 2) to cook in boiling or simmering liquid.

poach = 3) to poke or stir with a stick, as applied to driving fish into cover or flushing them out of hole and overhanging bank.

pock = a bag-shaped fishing net especially one fastened to an iron ring.

pock net = 1) the stomach of a fish.

pock net = 2) to catch fish in a net.

pocket = 1) fish court (the holding chamber in a trap net or the last chamber in any net).

pocket = 2) a small indentation of a shoreline.

pocket = 3) an indentation in the stream bottom below a run, a riffle or a rock where water is calmer and fish hold position. Also called pocket water.

pocket = 4) any small, deep section in a lake or river.

pocket beach = a small beach between two headlands.

pocket water = pocket (3).

pocosin = a swamp partially or completely enclosed by a sandy rim.

pod = 1) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for billfish.

pod = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for sailfish.

pod = 3) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for whiting.

pod = 4) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for tarpon.

pod = 5) a tight school of fish with individuals in contact with each other.

pod = 6) a group of fish related by a common factor, e.g. spawning males.

pod = 7) a folding stand on which carp rods are placed. It has a bite alarm at the front of the stand and a normal rod rest at the rear; can be set up on hard ground where bank sticks cannot be pushed into the soil.

pod = 8) a net used for fishing in small streams; an eel net or a purse-net.

pod net = pod (8).

podpod = boiled, smoked and seasoned fish product (Philippines).

pogey oil = a golden oil from menhaden or pogey (*Brevoortia tyrannus*) used in chumming (q.v.).

poikilo- = (prefix) = various, variable.

poikilosmosis = the ability of organisms to have an internal osmotic pressure which varies, following closely that of the environment, e.g. Myxinidae.

poikilosmotic = the adjective for poikilosmosis.

poikilotherm = an organism whose body temperature follows closely that of their environment as in most fishes, "cold-blooded". Opposite of homoiotherm.

point = 1) a narrow extension of land into the water, often sloping into deep water. Fish often congregate on and around points.

point = 2) tippet (the very end of a tapered leader that attaches to the fly in fly-fishing. It is the same diameter along its length and ranges from 7X (very fine) to 0X (very heavy)).

point = 3) the sharp end of a hook, *q.v.*

point = 4) poaching a fish with the point of a rod.

point bar = a stream bar deposited on the inside of a curve in the stream where water velocity is low.

point cut = n-cut (a net cut at right angles to the general course of the netting).

point fly = the lead fly in a two-fly rig.

point source pollution = pollution occurring from a discrete location such as a factory outlet.

pointing = fishing with a rod and line.

poison fishing = catching fish by means of a poison, usually one harmless to higher vertebrates, the poison being spread in the water or enclosed in a bait.

poisoning = 1) use of a chemical spread on water or added to a bait to poison fish and facilitate capture. See fish poisoning.

poisoning = 2) illness caused by eating poisonous fishes, *q.v.*

poisonous fishes = any fish containing a poison (exclusive of bacterial poisons). Sometimes restricted to those fishes whose poisons enter the victim's body orally, excluding venomous fish whose poison is introduced from glands by means of spines. For treatment of poisoning from spines, see venomous fishes, treatment of poisoning of; for poisoning from eating ciguotoxic fishes, see ciguatera poisoning; from clupeoid fishes, see clupeotoxicism; hallucinogenic fishes, see ichthyoalleinotoxicism; poisonous fish eggs or roe, see ichthyotoxicism; improperly preserved scombrotoxic and other marketed marine fishes, see scombrotoxicism; pufferfish or tetraodontiform fishes, see tetrodotoxin.

poisson d'Avril = "April fish", French for April fool, based on a newly spawned, naive and easily-caught fish. A paper fish is attached to a victim's back without him noticing.

poke = 1) cod-end (the end of a trawl net which retains the catch and the part of the net where most size-selection takes place. Cod end mesh sizes and structure are usually regulated).

poke = 2) a fish salad in Hawaiian cuisine comprising raw fish cubes with various vegetables and condiments.

poke end = the bottom of the bag part of an eel trap.

poke line = lazy deckie (a rope to haul the cod end to a ship's side).

poke net = halve net (a bag-shaped net set or held to retain fish as the tide ebbs (Scottish dialect)).

poker = a wood or metal stick used to disturb fish from crevices; may be combination poker and gaff (*q.v.*).

poking = catching fish with a net or spear where a pushing, jabbing or poking motion is used.

pokkali field = a traditional brackish-water fish and prawn culture used in paddy fields of Kerala, India. Fry enter the fields at high tide and are prevented from leaving by fine mesh nets at the sluices. Mullets (Mugilidae) and cichlids (Cichlidae) are harvested in December after growth from October when the rice was harvested and the fields turned over to fish culture.

Pol = ventrolateral photophore(s) above the AO series which lie along the base of the anal fin but below the lateral line in Myctophidae. Sometimes spelled POL.

polarity = referring to the genealogical position (advanced or primitive) of a character state of a taxonomic character.

polarisation = the process of determining polarity.

polder = land reclaimed from a body of water and protected by dikes.

pole = 1) any fishing rod (a device to carry and project a fishing line, hook(s) and bait or lures. The construction of rods is both a craft and a science and there is an immense variety of types).

pole = 2) a very long rod blank, held by hand and fished directly over the water, and used in matches and speed coarse fishing. It is made of sections that can be disassembled for carrying or be telescopic. Size range is 12.5 to 20 metres. A whip pole has the line tied directly to the end of the pole and is used to catch very small fish while elasticised poles have elastic threaded through the top three sections. These long poles enable a float rig to be placed exactly in position without casting, directly under the pole tip. Various other equipment items are used to manage the long pole and are mentioned below. Others include pole U rests (a rod rest set up as a U nearer the water with a second one set up as an inverted U to the rear - the rod rests in the forward U and hooks under the rear U), pole seats which have a central groove running between the sitting angler's legs where the pole fits, pole winders which are H-shaped plastic structures for storing the float rig on and protecting it, and pole winder anchors that are silicone rubber structures used to hold the loose end of a rig on a pole float winder to stop the rig unraveling.

pole buoy = a float with an upright stick to mark the position of stationary fishing gear (Newfoundland).

pole feeder pot = a cup clipped onto the end of a match fishing pole containing ground bait which can be tipped out, the pole pulled in and the cup removed before putting out the float rig.

pole float = a very small and sensitive float with a thin tip, balsa wood body, a thin wire stem and about 15-20 cm long. Body up floats have a wider bulge at the top of the flat body, body down bulge at the bottom, slims have very long and thin bodies, dibbers have the float tip as part of the thin float body instead of a separate tip section, and continental floats are large and are designed to use olivettes, *q.v.*, in large rivers.

pole hook = a large hook on the end of a pole used to impale a fish by sight or feel. Similar to a gaff, *q.v.*.

pole line = a hook, baited or not, attached to a line from a pole of similar length to the line. Usually fished from a boat.

pole roller = a mechanism to allow the very long pole rod to be slid back as sections are added or removed. Various models exist but have a stand supporting horizontal rollers and vertical end rollers on both sides.

pole-and-line fishing = surface schooling fish such as tuna are attracted to a vessel and driven into very active feeding behavior by throwing live or dead bait into the water, by spraying water onto the sea surface to simulate the escape behavior of small prey, and sometimes by use of lights. The fish are lured with a line and a barbless hook attached to a pole and pulled off the water by manual (sometimes with two people to each pole) or powered devices.

pole-and-live bait fishing = pole-and-line fishing.

policy = a course of action in relation to fisheries selected from alternatives by an authority.

poling = pole-and-line fishing.

polje = a large depression in karst with a flat floor. Stream water runs in and exits via underground holes (called ponors). Flood waters are too heavy to exit through ponors and the polje becomes a seasonal lake.

polled = of fish, beheaded.

pollutotype= a joke name in nomenclature for a type so damaged by pollutants or encrusted that it is not recognisable.

polster = the hatching gland rudiment when it underlies the forebrain during the early segmentation period. Also called pillow.

poly- (prefix) = many, several, excessive, generalised, affecting many parts.

poly vinyl alcohol = polyvinyl alcohol.

Polyacmic = referring to many periods of seasonal change in an aquatic population.

**polyandry** = a female mating with more than one male.

**polyaulacorhizid** = vascularisation of a tooth root through many small foramina concentrated in several grooves running parallel from the outer to the inner face, e.g. in Myliobatidae (Herman *et al.*, 1994).

**polybasic** = an unofficial term in nomenclature for a genus-group name which had several species included in it when first published.

**polycentric distribution** = the establishment of a population, species or other taxonomic unit in several widely separated geographic places.

**polyculture** = the practice of raising several species of fish together in aquaculture, or of fish with other species like shrimps, in either case the species are not competitors or predators.

**polycyclic aromatic hydrocarbons** = chemicals found in fish products as environmental contaminants, usually at low concentrations, much higher where there is contamination from petroleum and petroleum products. Found in smoked fish at 10 times or more than unsmoked fish. Some PAHs are carcinogenic.

**polycyclic fishes** = those fishes which spawn intermittently throughout their lives (as opposed to monocyclic fishes, *q.v.*), e.g. *Salmo*.

**polygamy** = both sexes mating with more than one other individual.

**polygyny** = a male mating with more than one female.

**Polyhaline** = 1) water with a salinity between 18.1-30.0 p.p.t. from ocean-derived salts.

**Polyhaline** = 2) sea water having a salinity greater than 34 p.p.t.

**Polyhalophile** = an organism thriving in a wide range of salinities.

**Polyhalophilic** = thriving in a wide range of salinities. Adjective for polyhalophile.

**Polyhymic tendon** = a tendon bound to the ventral face of the gas bladder for its entire length and connecting the anterior end of the gas bladder to the first haemal spine in *Velifer* (*Veliferidae*).

**Polymorphic** = 1) species having two or more distinct variants in the same population and sex, not recognised taxonomically.

**Polymorphic** = 2) a character having two or more states.

**Polynomial** = a scientific name comprised of the original genus and species but adding the name of the genus in which the organism is now classified. A subgenus and subspecies may also be added.

**Polynominal** = polynomial.

polynya (polynia) = open water surrounded by ice in the Arctic, formed by wind displacement or warm upwelling (Russian).

polyonym = a name of different and confused meanings, e.g. *nomen ambiguum*, *nomen confusum*, both *q.v.*

polyparasitism = parasitised by more than one species, often the case in fishes.

polyphagous = adjective for polyphagy.

polyphagy = feeding on a wide variety of foods.

polyphasic = in taxonomy, the use of many different techniques used to produce a classification.

polyphil = a reproductive guild (*q.v.*) having various spawning substrates. Adhesive eggs are attached singly or in clusters. The eggs have dense yolk with high carotenoid content, embryonic respiratory structures are well-developed, and feeding of young on parental mucus is common, e.g. *Sympysodon discus*.

polyphydont = a type of dentition where the teeth are continuously replaced as in most fishes excepting Holocephali and Dipnoi.

polyphyletic = having more than one origin or lines of descent, not closely related. Species may be grouped polyphyletically as a convenience until a monophyletic classification can be made.

polyphyodont = polyphydont.

polyploid = having more than twice the haploid number of chromosomes, e.g. 3n, 4n, 5n, etc.

polysaline = water with a salinity between 18.1-30.0 p.p.t. from land-derived salts.

polyspondylic = adjective for polyspondyly.

polyspondylous = adjective for polyspondyly.

polyspondylous vertebra = vertebra showing polyspondyly (1).

polyspondyly = 1) notochord surrounded by many serially arranged calcified rays, in effect having several centra e.g. *Chimaera* has 5-9 centra, *Amia* has 2 in the caudal region.

polyspondyly = 2) calcified rings around the notochord at intervals which do not seem to correspond in a regular way to the placement of body segments, found in some Chondrichthyes.

polystenohaline = organisms that only inhabit oceanic waters of relatively constant high salinity.

**polythetic** = a classification where taxa are defined by a combination of characters. These may be possessed by other taxa and any of the taxa under consideration may not have any of the characters. Taxa with the most shared characters are grouped together.

**polytomy** = multifurcation (a node in a tree that connects more than three branches. If the tree is rooted or directed, one branch represents the ancestral lineage and the other branches descendent lineages. A multifurcation often results because of a lack of data to resolve the branches although it could be the simultaneous splitting of several lineages).

**polytrophic** = an ecological term used to describe an organism which has more than one mode of feeding.

**Polytypic** = a taxon including several subordinate taxa, e.g. a polytypic genus is one containing several species.

**Polyunsaturated fatty acids** = fatty acids with 18 or more carbon atoms and two or more double bonds, very important in the early development of marine fish larvae. Also important in human nutrition and health. Abbreviated PUFAs.

**Polyvinyl alcohol** = a water soluble plastic used by anglers in Europe as bags to hold ground bait or as string for tying on boilies, q.v., or pellets. The bags or strings dissolve gradually in water and release the baits to attract fish. See PVA bag and PVA tape. Abbreviated as PVA.

**pond** = 1) a small, shallow, confined body of water, fresh or salt; technically less than 8 ha.

pond = 2) a pond stocked with fish for commercial or ornamental use.

pond = 3) an attraction at a fair where miniature fishing gear is used to hook fish-shaped tokens from a small pool to win prizes.

pond = 4) the ocean or sea, as a joke, e.g. the herring pond.

pond = 4) as a verb, to obstruct the flow of water to create a pond or small lake.

**pond carp** = the common carp, *Cyprinus carpio*, as raised in pond in historical times.

**pond culture** = the raising of fish in ponds on land, e.g. carp and rainbow trout.

**pond fish** = fish usually reared in a pond.

**pond grate** = a screen installed at the inlet or outlet of a water body to prevent entry or escape of fish.

**pond spawning** = spawning in a pond specifically designed for that activity, often equipped with nests for egg deposition or other suitable substrates.

**pondage** = 1) small-scale storage of water at a power plant to equalise daily or weekly fluctuations in river flow or to allow for fluctuations in power requirements.

pondage = 2) water capacity of a pond.

ponding = 1) an increase in water level caused by a blockage to stream flow.

ponding = 2) formation of a pond by damming a water course.

pondkeeper = a person who stocks and maintains a pond with various organisms including fish, usually for display rather than food, e.g. koi. Curiously not a word generally found in dictionaries although there are magazines with this term in their title.

ponor = a small hole forming an exit from a polje (*q.v.*).

pons moultoni = a loop of bone projecting from the inner wall of the chondrocranium appearing to arise from the sphenotic and spanning the anterior vertical canal of the ear medially, usually across the canal's anterior (lower) half in certain genera of Beryciformes, Polymixiiformes and Perciformes.

pony board = a small otter board used in place of a dan leno, *q.v.*

pool = 1) stream habitat having smooth surface, slow current and some moderate to deep water.

pool = 2) a small, deep confined body of water fed by springs or streams or flushed by the sea such that there is water circulation.

pool = 3) a small pond.

pool cue = a fishing rod with stiff action and therefore undesirable.

Pool of Sacred Fish = found at Şanlıurfa in southeastern Turkey in the courtyard of the Halil-ur-Rahman mosque dating from 1211. Legend has it that this is the site where Abraham was thrown into the fire by Nimrod, the fire miraculously becoming the pool and the burning logs the fish. The Turkish name is Balıkligöl.

poor man's lobster = the tail meat of monkfish (*Lophius* species, anglerfishes).

pool quality = an index of the suitability of a pool for supporting fish. Factors involved are cover, dimensions, and velocity.

pool shark = a hustler at the game of pool or billiards; a hustler misrepresenting his skill level in order to cheat the other player out of money. Based on the predatory reputation of the shark. See also cardshark and loan shark.

pool/riffle ratio = the ratio of surface area or length of pools to the surface area or length of riffles in a given stream reach used to describe fish habitat rearing quality.

pool-and-weir ladder = a series of small dams making pools of regular length in a long, sloping channel for fish to travel around a dam. Fish jump from pool to pool in the ladder. See also rock-ramp fishway, vertical slot fish passage and DeNiel fishway.

pooler = a salmon which has lain a long time in a river but not yet spawned (Newfoundland).

poor fish = hapless, unfortunate.

poor john = dried and salted cod (Newfoundland).

poorly nourished = in aquaculture, fish receiving too small amounts of food, or a deficient diet.

pooty = a small cod (Orkney dialect).

pop corn = bass (*Micropterus* spp., Centrarchidae) too short to meet tournament standards; usually less than 14 inches (ca. 36 cm). Also called baby, dink, throw back, nubbin, and slick.

pop-up bait = a bait, usually a boilie, q.v., which float or pop-up off the bottom. Flotation is achieved by microwaving the boilie or inserting foam.

pop-up archival tag = pop-up tag.

pop-up tag = a tag that detaches itself from the fish after a pre-determined period has elapsed since tagging. The tag then sends a signal via satellite, providing its position and downloading any other available information. The fish or tag need not be retrieved for the data to be used.

popeye = protrusion of the eyeballs. Usually results from liquid or gas accumulation at the rear of the eye socket or by diseases. Also called exophthalmia.

popper = 1) a lure with a flat face that makes a popping sound and surface disturbance when retrieved by a jerk and pause method. Used for bass, other warmwater species and some marine fishes.

popper = 2) a fly with foam or cork in its makeup and a flat or cup-shaped design causing the popping sound. Used for bass and panfish in North America.

Popper's dictum = a theory should be tested with the direct aim of trying to refute it.

popping cork = a styrofoam device shaped to make a popping sound when retrieved, imitating the sound of fish feeding at the surface, thus attracting game fish.

population = a local group of individuals which form a potentially interbreeding community with other such populations. Usually populations have little demographic or genetic exchange with other such populations. Also defined as the total number of individuals of the species. May be used to mean a stock in fisheries work.

population density = the number or mass of individuals of a given population occupying a given space.

population dynamics = the study of fish populations and how fishing mortality, growth, recruitment, and natural morality affect them over time.

population model = a component of a stock assessment model describing how the population changes over time. May be age/size structured or biomass based, deterministic or stochastic, density-dependent or density-independent, spatially structured or spatially aggregated, equilibrium or non-equilibrium.

population structure = the characteristics of a given population such as age, size composition, sex ratio, etc.

population viability analysis = a quantitative analysis which estimates the extinction probability of a species or population based on the known life history and specified management or non-management options. Abbreviated as PVA.

pore = a tiny opening in the skin, often associated with sensory perception in fishes.

pored scale = a lateral line scale with a pore.

pork rind = a bait or lure made from pig skin cut into strips or shapes and preserved chemically. Used for bass, pike and muskellunge in fresh water and used in saltwater fishing in association with various jigs, spoons, feathers, etc.

pornotype = a joke name in nomenclature for a type based principally on characters of the genitalia.

porpoising = feeding in slow surface rolls, e.g. trout taking surface insects. See also priming behaviour.

port = 1) the land base for a fishing vessel (or any other type of vessel).

port = 2) the left side of a vessel when facing the pointy end.

port sampler = a scientist who samples fish catches at the point of unloading from fishing vessels. Usually length is recorded and some structure taken that shows growth rings, e.g. otoliths.

port sampling = the actions of a port sampler.

port technician = port sampler.

portable lift-net = a small lift-net, *q.v.*, operated by hand, with no fixed installation. Also called lift hand net.

portal vessel = a large vein originating and ending in a capillary bed such as the kidneys and liver.

portion = a piece of a wet fish of specified uniform weight or size (about 2 cm thick) cut from a fillet, or a piece of a frozen fish usually rectilinear and of specified size and weight cut from a block of frozen fish flesh; wider than a fish stick or of a different shape.

Portuguese water dog = a dog used to retrieve fish and fallen articles from the water, to carry messages between boats and to guard boats. Used from about 1500 A.D. onward.

position = in nomenclature, the place of a taxon relative to other taxa in a classification, regardless of rank.

position precedence = the position on a page or in a book of a scientific name or nomenclatural act. This may be used by a first reviser in giving precedence to a name, act or spelling, or by an author designating a type species. However, this is not mandatory.

positive = fish intent on feeding. Also called active.

possession limit = the number and/or size of a species that a commercial or recreational fisher can legally have at any one time (on hand, in storage, in transit, etc.), cf. catch limit.

post = a cove or harbour with space on the foreshore for facilities used in coastal fisheries.

post hoc = the cause of a later event simply by virtue of having happened earlier; coming to conclusions.

post- (prefix) = behind, posterior to, after. Often used in measurements for identification, e.g. post-branchial - behind the gill region.

post-branchial body = thyroid gland.

post-smolt = a stage in a salmonid's development from its departure from a river until the onset of wide annulus formation at the end of the first winter in the sea (Allan and Ritter, 1977).

post-spawning = of or pertaining to the period after spawning.

post-type = in nomenclature, an obsolete name for neotype (*q.v.*).

postanal membrane = a membrane between the anus and anal fin origin in larvae, e.g. in Terapontidae.

postanal myomeres = muscle bands posterior to the anus in larval fishes, the count being used in identification. The most posterior myomere is bordered by a complete myoseptum in some counts or an incomplete one in other counting methods.

postclavicle = postcleithrum.

postcleithra = plural of postcleithrum.

postcleithral head spine = a spine on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

postcleithrum (plural postcleithra) = a dermal bone of the pectoral girdle posteroventral to the cleithrum which supports it dorsally. There may be one to several postcleithra (absent in some species). Also called metacleithrum and postclavicle.

postcranial pit = a marked depression in the rear of the skull in certain Agonidae, e.g. *Bothagonus swani*. It may be involved in sound production via modified anterior ribs which produce stridulation.

postdorsal length = the distance from the insertion of the dorsal fin to the base of the caudal fin.

posteriad = behind, posterior to.

posterials = teeth on the posterior field of the oral disc in lampreys (Petromyzontidae).

posterior = behind, opposite of anterior.

posterior anal photophore = one of a row of light organs on the ventrolateral surface of the caudal peduncle in Myctophidae.

posterior cardinal vein = paired veins from the posterior part of the trunk originating in the renal and segmental (intercostal and interspinous) veins and lying on each side of the dorsal aorta and between the kidneys.

posterior cerebral vein = a vein draining blood from the posterior braincase into the lateral head vein, *q.v.* or anterior cardinal vein, *q.v.*

posterior field = the exposed part of the scale, usually wedge-shaped and delineated by imaginary lines from the focus to the posterior dorsal and ventral corners of the scale.

posterior intestinal artery = a branch of the coeliac artery that serves the straight posterior terminal portion of the intestine.

posterior margin = the rear edge of a scale. Also called apical margin.

posterior process = innominate bone (the pelvic fin bone in Gasterosteidae, sometimes a misnomer for the ectocoracoid. Also called pelvic bone, pelvic plate, pubic bone and medial plate).

posterohyal = epihyal (the deep bone at the upper end of the hyoid arch below the interhyal. May bear a dentigerous plate. Also called dorsal ceratohyal. May or may not be homologous with the epal element of the branchial arches).

posterolateral photophore = one of the ventrolateral light organ(s) above the AO series which lie along the base of the anal fin but below the lateral line. Abbreviated AOp.

posterotemporal = posttemporal.

postflexion = one of three sub-stages in the larval stage of fishes (the others being preflexion and flexion, *q.v.*). The caudal fin section of the notochord is at an angle of 45° to the notochord axis, ventral caudal rays and supporting elements may not be fully developed. Postflexion ends with beginning of transformation to the juvenile stage.

postfrontal = a term misapplied to the dermosphenotic, *q.v.*, of fishes. Equivalent to the supraorbitals.

postglacial lake = a lake formed after a glaciation from melting ice; it often provides a route for fish movements.

postinfraorbital = dermal bones of the circumorbital series found posterior to the orbit and often elongated anteroposteriorly.

postlabial groove = a groove behind the lower lip.

postlarva = a larva following the time of absorption of yolk; applied only when the structure and form continues to be strikingly unlike that of the juvenile (Hubbs, 1943). Postlarvae of some species are so distinctive they were placed in different genera than the adults. Some of these generic names are now used to indicate the postlarval stage, e.g. acanthostedion stage of Peristediidae, tholichthys of Chaetodontidae, acronurus of Acanthuridae, rhynchichthys of Holocentridae, krohnii of Macrouridae.

postmaxillary process = a process directed upward and backward at the middle or posterior part of the premaxilla. It serves to prevent the lateral movement of the premaxilla when the mouth opens.

postocular = the region or distance between the posteriormost rim of the orbit and the posterior edge of the opercle (or opercular membrane).

postocular canal = the cephalic lateral line canal connecting the interorbital canal with the body lateral line canal, e.g. in Tripterygidae.

postocular head spine = a spine on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

postorbital = behind the orbit or eye; a bone in the series behind the eye, part of the infraorbital series. They are SO<sub>3</sub>, SO<sub>4</sub>, SO<sub>5</sub> and SO<sub>6</sub> or IO<sub>3</sub>.....IO<sub>6</sub>. IO<sub>6</sub> is also called the dermosphenotic, *q.v.*

postparietal = 1) extrascapula (one of several small bones bordering the posterior margin of the skull roof in primitive Teleostomi. They apparently originate from enlarged scales. One of a series of from 2-8 bones known variously as cervicals, nuchals, supratemporals or tabulars).

postparietal = 2) dermosupraoccipital (the superficial, paired dermal bone covering the supraoccipital with which it may fuse. In many Teleostei it is a hinge for the skull articulation with the circumorbital ring. Siluridae have a posterior toothed process that secures the nuchal disc. Also called parietooccipital or dermal supraoccipital).

postrematic filament = one of the anterior set of gill filaments extending into the gill slit in front of each gill arch at the posterior border of the gill slit.

postrostral = one of the superficial dermal bones covering the upper face of the ethmoid in front of the eye behind the rostrals in certain Holostei.

postrostrum = the posterior point of an otolith, generally longer than the pararostrum.

posttemporal = the superficial, Y-shaped dermal bone connecting the pectoral girdle with the skull, namely the epiotic or supraoccipital (upper part of the bone) and the opisthotic (in primitive fishes) or the intercalar (in modern fishes)(lower part of the bone). Traversed by the posttemporal lateral line canal. Also called suprascapula, suprascapular, supracleithrum I and supraclavicle I.

postzygapophyses = plural of postzygapophysis.

postzygapophysis (plural postzygapophyses) = the posterior paired process of the centrum of a vertebra which articulates with the prezygapophysis of the vertebra posterior to it. There may be two dorsal and two ventral postzygapophyses. The articular facet is on the ventral surface of the postzygapophysis.

pot = a portable cage-like trap which fish enter through one or more small openings and from which they cannot readily escape because of the funnel shape. May be baited or not, made of various materials, of various sizes and shapes, and of various local names from country of use or species of capture, e.g. eel pot, Scottish creel. Usually set on the bottom, singly or in rows, and with a buoy to show their position although modern GPS equipment may enable the buoy to be submerged to prevent poaching (or facilitate poaching). Used to catch crabs, lobsters and occasionally fishes.

pot gear = pot.

pot-and-line = a stationary line with a buoy attached to a pot.

potable = water fit for human consumption.

potam- (prefix) = river.

potamal = adjective for potamon.

potamal zone = the sandy-sludge zone of a watercourse where summer temperatures exceed 20°C.

potamic = referring to rivers.

potamicolous = living in rivers.

potamocoa = the biotope and biocenosis of the potamal zone.

potamodromous = those fishes which make true migrations wholly in freshwater, e.g. *Salminus*, *Moxostoma*, *Labeo*.

potamology = the study of running water and its inhabitants.

potamon = the organisms inhabiting the sandy-sludge zone of a watercourse where summer temperatures exceed 20°C.

potamophobia = a fear of rivers or running water.

potamoplankton = plankton found in running water. Also called rheoplankton.

potassium permanganate = a strong oxidising chemical ( $KMnO_4$ ) used as a disinfectant and to control external parasites of fishes.

potential fecundity = the batch of ripe ova present in the ovary, although some oocytes undergo atresia in the post-spawning period.

potential yield = the yield of fishes estimated to be available for exploitation.

potentially valid name = an available name which is not objectively invalid.

pothole lake = a lake filling a depression formed by glacial activity.

potpourri fishing = fishing where a variety of species are available or in which more than one method can be used.

potted herring = herring pickled with salt, vinegar and spices. Often as rolled fillets baked in an oven and sometimes sprayed with kipper dye after cooking.

potter = a person in charge of, or uses, fish pots.

potting = the act of setting and pulling pots.

pouch brooder = a reproductive guild (q.v.) where eggs are incubated in an external marsupium (an enlarged and everted lower lip, a fin pouch, a ventral pouch covered by a membranous or bony plate). The embryonic respiratory structures and pigments are usually well-developed, e.g. *Loricaria vetula*, *Syngnathus* spp., *Hippocampus* spp.

pouder = preserved with salt, cured. Also spelled powder.

pound = 1) 0.454 kg (avoirdupois, abbreviated as lb), 0.373 kg (troy, abbreviated as lb tr).

pound = 2) a temporary compartment or bulk constructed in a fishing stage, q.v., from boards in which to salt fish in Newfoundland.

pound = 3) the space where fish boxes are packed below deck on a ship.

pound = 4) an enclosure for fish, e.g. in inshore waters where fish are held before processing or a pond for fish.

pound = 5) pound net.

pound net = a net, fence, reed or bamboo screen, set, staked or moored in streams, in lakes or along the coast to direct fish into a holding container for easy removal. Also called trap net or setnet.

pounding = holding of live fish in tanks or nets for extended periods.

pout = a small fish (Scottish dialect).

pout net = a net fastened to poles by which fishermen poke the banks of rivers to force out the fish (British dialect). Also spelled powt net.

pout staff = the detachable pole of a pout net.

poutine = 1) young of several species of fish, especially Atherinidae. May be fried or used for making pissala.

poutine = 2) French fries topped with cheese curds and hot gravy (Québec).

pouting = spearing salmon (British dialect).

powder = pouder.

power = fishing power is the catch which a particular gear or vessel takes from a given density of fish during a certain time interval. Larger vessels have a greater ability to catch more fish and thus have greater their fishing power. Also, improvements in a vessel or gear, such as fish finders, Loran, etc., can increase fishing power. Depends on the area or volume affected by the gear, relative to the total area covered by the stock ( $a/A$ ), the number of animals present in that area or volume relative to the total stock ( $n/N$ ), and the proportion ( $p$ ) of the animals present in that area or volume which can effectively be captured by the gear. If the stock ( $N$ ) were randomly distributed in the distribution area ( $A$ ), the proportion of the stock present in the sector affected by the gear ( $n/N$ ) would be equal to ( $a/A$ ) and the catch would be ( $pa/AN$ ).  $p(a/A)$  will give a direct measure of fishing mortality.

power filter = a filter which hangs on the side of an aquarium or is submerged in it, containing an internal pump to draw water through. It provides mechanical filtration, and optionally chemical or biological filtration.

power roller = a roller at the stern of purse seiner that aids in hauling in nets.

powergum = a very strong silicone rubber line used as a shock absorber for lead weights and feeders in angling. Used when long casts are made so that the shock does not break the line.

powerhead = a small submersible pump with only one moving part, an impeller. Used to create current within a tank or to drive filters such as under gravel filters, canisters and protein skimmers. Usually too powerful for small aquaria.

powl = to wriggle or squirm as with a newly-caught fish (Scottish dialect).

powt net = pout net.

pox = any disease which causes skin and mucous membrane eruptions or lesions.

pox disease = carp pox (one of the oldest known fish diseases found in cultured carp, other cyprinids, pike-perch and aquarium fishes. It is caused by *Herpesvirus cyprini*. Also known as carp papillomatosis, epithelioma papulosum, fish pox, cyprinid herpesvirus I (CHV). Skin lesions appear as the water temperature drops in winter as small milky-white spots that merge and cover large skin areas).

pp. = pages.

ppb or p.p.b. = parts per billion.

ppm or p.p.m. = parts per million.

ppt or p.p.t. = parts per thousand.

practical salinity unit = the ratio K of the electrical conductivity of a sea water sample of 15°C and the pressure of one standard atmosphere, to that of a potassium chloride (KCl) solution, in which the mass fraction of KCl is 0.0324356, at the same temperature and pressure. The K value exactly equal to one corresponds, by definition, to a practical salinity equal to 35. In this definition, salinity is a ratio and parts per thousand (‰) is therefore no longer used, but an old value of 35‰ corresponds to a value of 35 in the practical salinity. Practical salinity is a ratio and strictly no units should be used but often PSU or psu is added to the value.

practice plug = a lure without hooks so that casting can be practiced on dry land without snagging.

praeopercle = preopercle.

praezygapophysis = prezyagapophysis.

præzygapophysis = prezyagapophysis.

pragmatotype = pragmatype.

pragmatotype = an unofficial term in nomenclature for a specimen used as a source of information for a type lacking diagnostic characters.

prahoc = the gray, fermented fish paste of Cambodia. Strong-tasting but a Cambodian family consumes 20 kg a year.

prairie pothole = pothole lake on the plains of North America.

præcoracoid = a portion of the coracoid bone (*q.v.*) more or less separate from the rest.

præcoracoid arch = an arch in front of the coracoid (*q.v.*) bone.

Prc = photophore(s) on the lower half of the caudal peduncle at the base of the caudal fin in Myctophidae.

pre- (prefix) = before, anterior to. Often used in measurements for identification, e.g. predorsal length.

pre-baiting = throwing ground bait, *q.v.*, into an area where the angler intends to fish the next day or next week. It attracts fish to this area on a regular basis to feed.

pre-ethmoid = one of the paired deep bones lying above the vomer in *Amia* and *Esox*. Similar bones occur in Catostomidae and Cyprinidae. Formerly called septomaxilla but not homologous with that bone in tetrapods.

pre-existing Codes = rank-based Codes (e.g. of Zoological Nomenclature) in operation before the PhyloCode was drafted in 1997-2000.

pre-existing name = a scientific name that, prior to its establishment under the PhyloCode was either potentially valid or valid, or in use but not governed by the Code of Zoological Nomenclature, e.g. names above the family-group.

pre-Linnaean name = a name published prior to 1 January 1758, the starting point for zoological nomenclature.

pre-recruit = a fish which has not yet reached the recruitment stage.

pre-spawning = of or pertaining to the period before spawning.

pre-spawning mortality = non-fishery mortality of adult fish between the time the fish enter a river on a migratory run and the completion of spawning.

pre-stretched line = line that has been stretched so that it is much thinner. Strength is retained but it is no longer as elastic. Used in Europe for catching small or very shy fish.

preacher = St. Anthony of Padua (1195-1231), a Franciscan monk, who preached to a school of fishes, which listened attentively.

preanal fin = fin in front of the anus in larval fishes.

preanal length = the distance from the anteriormost tip of the body to the anal fin origin or the centre of the anus.

preanal membrane = a membrane anterior to the anus in some larvae.

preanal myomeres = a count of the number of myomeres or muscle blocks before the anal fin in eel leptocephali. The count includes the myomere over the anus.

prearticular = 1) the paired dermal bone of the lower jaw covering the articular mesially, bearing teeth and having a well-developed coronoid process.

prearticular = 2) coronoid (a paired dermal bone bearing teeth located on the upper edge of Meckel's cartilage. One pair is found in Acipenseridae and two pairs in *Amia* and *Lepisosteus*. Also called presplenial, splenial and intradentary).

precatch loss = those fishes that die as a result of fishing, or through loss of gear, but are not caught.

precaudal photophore = one of the light organs along the lower base of the caudal fin in Myctophidae. Abbreviated Prc.

precaudal pit = the notch on the caudal peduncle just before the caudal fin. Also called caudal pit.

precaudal vertebrae = the anterior vertebrae lacking haemal spines and mostly bearing ribs.

precautionary adjustment = precautionary approach.

precautionary approach = measures intended to reduce risk to the resource, its environment and the people involved in the fishery. The allowable catch biomass may be reduced or stock spawning biomass allowed to increase without scientific evidence of overfishing. See also  $F_{pa}$ ,  $B_{pa}$ ,  $F_{lim}$  and  $B_{lim}$ .

precautionary principle = precautionary approach.

precautionary reference points = estimated values derived via an agreed scientific procedure corresponding to the state of the fishery and used as a guide for fisheries management. There are two types, conservation or limit reference points and management or target reference points. The former constrain harvesting to produce maximum sustainable yield while the latter are intended to meet management objectives.

precautionary TAC = a TAC, q.v., set in the absence of scientific advice on stocks.

precedence = the order of seniority of available names or nomenclatural acts determined by application of the Principle of Priority or of simultaneously published names or acts as specified in the International Code of Zoological Nomenclature Article, or by a ruling of the International Commission on Zoological Nomenclature using its Plenary Power.

precentrum = the anterior portion of a vertebral centrum commonly bearing neural and haemal arches. In some fishes such centra alternate with centra having no arches.

prechordal cartilages = embryonic cranial elements medial to the optic capsules.

prechordal plate = axial hypoblast located anterior to the chorda mesoderm.

precipitation = discharge of water from the atmosphere onto land or water; also a measure of the quantity. A more general term than rainfall since it also includes snow, hail and sleet.

preclavus length = a measure of length in juvenile Molidae where a true caudal fin is absent, runs from tip of snout to base of pseudocaudal rays.

precocial = 1) young showing independent activity from birth. Opposite of altricial.

precocial = 2) a fish that has matured quickly, or faster than the remaining fish of its age-class. Usually exhibited by male fish.

precocious = 1) a fish that has matured quickly, or faster than the remaining fish of its age-class.

precocious = 2) any early formation of a structure during embryonic development compared to the typical timing.

precocious breeding = a female aquarium fish bred or breeding at too young an age. This may have an impact on growth and development as energy is directed towards egg production. Sexes may have to be separated to prevent this. See also overbreeding.

precocious parr = a male parr (*Salmo salar*) fully ripened or matured in fresh water (Allan and Ritter, 1977).

precoracoid = a portion of the coracoid bone (q.v.) more or less separate from the rest.

precoracoid arch = an arch in front of the coracoid (q.v.) bone.

precurrent = occurring beforehand.

predation = preying or feeding on other animals.

predatory = adjective for predation.

predentary = a neomorph bone found in Istiophoridae.

predominant = the fish species that is the most abundant in a catch, not always the target species.

predorsal = before the dorsal fin.

predorsal bones = median bones located between the head and the dorsal fin above the vertebral column which resemble the proximal radials of the dorsal fin with which they are serially homologous.

predorsal length = the distance from the dorsal origin to the anteriormost tip of the head (the lip, snout or lower jaw).

predorsal myomeres = a count of the number of myomeres or muscle blocks before the dorsal fin in eel leptocephali. The count includes the myomere under the dorsal fin origin.

**predorsal ridge** = a ridge of tissue on the nape in Monacanthidae, regarded as an adipose fin by some workers.

**predorsal scales** = the row of scales along the midline between the dorsal fin and the back of the skull. In counting, all scales crossing the midline are included.

**predrying** = removal of some moisture from a fish as a prelude to further processing such as smoking.

**pree the nets** = to make a test haul to see if an area is productive of fish, especially herring (Scottish dialect).

**preen** = to stop at any place and make a try for fish (Shetland and Orkneys dialect).

**preen hook** = a hook used in fishing (Shetland and Orkneys dialect).

**preethmoid** = pre-ethmoid.

**prefilter** = a small mechanical filter attached to the input of another filter, usually biological. It is there to make sure that the biofilter does not get clogged with gunk, decreasing its effectiveness.

**preflexion** = one of three substages in the larval stage of fishes (the others being flexion and postflexion, *q.v.*). The notochord is straight and caudal fin structures are beginning to form on the ventral side of the notochord.

**prefrontal** = a superficial, paired, dermal bone lying in front of the eye between the lacrymal and first supraorbital and covering and fusing with the parethmoid; a term often used for the lateral ethmoid or a portion of the lateral ethmoid of dermal origin.

**pregnancy test** = the bitterling (*Rhodeus amarus*, Cyprinidae) was used briefly for pregnancy tests on humans. A female bitterling would stretch her ovipositor if her fish bowl contained as little as one teaspoonful of urine from a pregnant woman, presumably occasioned by female sex hormones in the urine. It was later found that secretions from the adrenal glands of male and female humans also caused the same effect and the test was discontinued (Time, 12 October 1936).

**prehaemal vertebrae** = abdominal vertebrae.

**prehensile** = capable of grasping, e.g. the tail of a seahorse, *Hippocampus*.

**prejuvenile** = a developmental stage following acquisition of minimum fin ray complement of adult but before assuming adult-like body form. Used for fish strikingly different from juvenile.

**premaxilla** (noun, plural premaxillae) = one of the paired, superficial, usually toothed, dermal bones of the upper jaw, proximal or anterior to the maxillaries; in primitive Teleostomi they comprise the middle, in more advanced forms they may comprise the whole, of the oral edge of the upper jaw. Teeth may be present. In Diodontidae, the premaxillae are ankylosed and form a

single bone. Absent in Chondrostei. In Holostei (*Lepisosteus* and *Amia*) the bone has two ossification centres and therefore is a double bone. Holostei and Teleostei have an ascending process anteriorly but these may not be homologous. Posterior to the ascending process in Teleostei there may be an articular and a postmaxillary process, and a posterior extension, the caudal process. Also called premaxillary, surmaxillary, bimaxillary or intermaxillary.

premaxillae = plural of premaxilla.

premaxillary (adjective) = structures on or involving the premaxilla.

premaxillo-ethmo-vomer = a clumsy name for the fused premaxilla, vomer, ethmoid and lateral ethmoid in Anguilliformes.

premaxillo-nasal = the antorbital in *Lepisosteus* which has three nasal bones, prenasal or rostral, adnasal or nasal and premaxillo-nasal or antorbital.

premises = the waterfront property, including the stores, wharf, flakes and other facilities, of a merchant, planter or fisherman (Newfoundland).

premium species = those fish of particular commercial value such as sturgeons and salmonids.

premix = in aquaculture, a combination of dietary items mixed and blended before being added to the main part of the ration.

prenasal = an anterior dermal bone near the snout tip, bearing a sensory canal. Also called rostral.

preoccupied name = one that is a junior homonym, a name with the same spelling that is erected anew for another taxon.

preocular = before the eye.

preocular head spine = a spine on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

preopercle = the L-shaped dermal bone which lies in front of the gill cover and which bears the upper part of the preoperculo-mandibular lateral line canal. It may bear spines or fine teeth. It belongs to the suspensorium rather than the opercular series and acts to prevent the suspensorium from moving laterally. Also called preoperculum.

preopercular bone = preopercle.

preopercular head spine = a spine on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and

nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

preoperculo-mandibular canal = the cephalic lateral line canal extending along the preoperculum and lower jaw. The preopercular and mandibular parts of the canal may be disconnected. Abbreviated as PM.

preoperculum = preopercle.

preorbital = 1) the usually large bone lying anterior and slightly ventral to the eye. Also known as the lachrymal or first suborbital. The preorbital is the first of the circumorbital series. In *Lepisosteus* comprises 6-8 ossicles, joined by teeth and forming the border of the upper jaw.

preorbital = 2) the area anterior to or below the eye.

prepacked = fish which has been made up in a container ready for the customer to buy.

preparation = a specimen or part thereof preserved apart from or in a different way to the original specimen, e.g. scales on a microscope slide.

prepectoral pores = a count of pores before the pectoral fin used in identification of members of the Anguilliformes.

prepelvic tenaculum = clasper, q.v. (a supplemental clasper in Holocephali, in front of the pelvic fin).

preprint = an article printed especially for private distribution in advance of the publication that is to contain it. It carries a date in advance of a later reissue as part of a collective or cumulative work. Preprints may be published works for the purposes of zoological nomenclature.

present = the process of presentation (verb).

presentation (noun) = 1) placing the right bait, lure or fly in the right place in the right way in order to catch a fish.

presentation = 2) a payment for fishing rights (12th century England).

preservation = 1) the process of storing organisms in a museum indefinitely by some process that halts decay. Fishes are preserved by immersion in formalin (an aqueous solution of formaldehyde) at concentrations depending on the size (thickness) of the specimen (usually in the 5-10% range). Large specimens may require injection to ensure that the formalin reaches internal tissues. Formalin fixes the proteins, stops enzymatic decay and kills bacteria. Specimens are later transferred to an ethanol solution (70-80%) which is non-carcinogenic and easier to work with.

preservation = 2) use of additives to extend shelf life of fish products. They serve to inhibit bacterial growth and chemical changes in the product. Preservatives are not usually permitted for chilled or frozen raw fish but are used in marinades and in dried fish.

preservation = 3) the maintenance of individual organisms, populations or species by planned management and breeding programmes.

presmolt = a juvenile salmon with parr marks.

presorting = removal of material from a catch before the point where a sample is taken.

prespenial = coronoid (a paired dermal bone bearing teeth located on the upper edge of Meckel's cartilage. One pair is found in *Acipenseridae* and two pairs in *Amia* and *Lepisosteus*. Also called splenial, prearticular and intradentary).

press = placing split and salted cod in a pile at various stages of the curing and drying process.

press cake = residue left over from the pressing stage in making fish meal and oil from fatty fish. It comprises 55-60% water and 4-5% oil. Usually dried and ground to make meal. The watery liquid from the pressing stage is called press liquor.

press liquor = watery liquid pressed out from cooked fish comprising dissolved solids, solids in suspension, oil and water. The oil is separated with a centrifuge, the solid matter is press cake and the watery part remaining is called stick water.

pressed caviar = originally the only way to preserve caviar, this type is now made from sevruga or oscietre eggs that have been damaged in processing, or from immature or overripe eggs. It has a very salty, fishy taste and 6 kg of eggs make 1 kg of pressed caviar.

pressed fish = whole salted fish packed in barrels and pressed to about one-third their original bulk.

pressed pilchards = whole pilchards, dry salted packed in barrels and pressed to about one-third of the original bulk; further fish are added to the barrel and the pressing continued until the barrel is full.

pressure = 1) quantity of fish caught per hectare (fishing pressure).

pressure = 2) a measure of resource use by anglers, e.g. number of angler hours, party hours, boat hours, trips on the water. Also called fishing effort.

prestige bias = exaggeration of size of number of fish caught as reported by anglers in an angler survey; bragging.

preterminal = slightly anterior to the posterior point, e.g. a barbel attached slightly anterior to the end of the upper lip (subterminal).

pretrematic filament = one of the posterior set of gill filaments extending into the gill slit behind each gill arch at the anterior border of the gill slit.

pretty kettle of fish = a bad state of affairs; a very difficult and annoying situation; something to be considered or reckoned with. From kiddle, a basket set in the opening of a weir for catching fish. Also called a nice kettle of fish.

preural vertebra = one of a series of vertebrae preceding the ural vertebrae and distinguished by lacking hypurals. They precede the bifurcation of the caudal artery. Called PU<sub>1</sub>, PU<sub>2</sub>, etc, counted anteriorly from the first ural vertebra.

prevailing usage = that usage of the name which is adopted by at least a substantial majority of the most recent authors concerned with the relevant taxon, irrespective of how long ago their work was published.

prevomer = a frequently toothed median or paired dermal bone in the middle of the roof of the mouth covering the ethmoid ventrally and in front of the parasphenoid. Often incorrectly called vomer, but this bone in mammals is not homologous with the bone in fishes.

prezygapophyses = plural of prezygapophysis.

prezygapophysis (plural prezygapophyses) = an anterior process of a vertebra which articulates with the postzygapophysis of the vertebra anterior to it. There may be paired dorsal prezygapophyses and paired ventral prezygapophyses. The articular facet is on the dorsal surface of the prezygapophysis.

priapia = plural of priapium.

priapium (plural priapia) = a complex muscular and bony clasping and copulatory organ derived mainly from the pelvic fins, found under the head of male Phalostethoidea with the anus opening on one side and the genital pore on the other. The structure varies among family members. Hook-like ctenactia articulate basally with the aprocotal axial which is movably articulated with the proctal axial bone itself, suspended anteriorly by the outer (and sometimes inner) pulvinular bone from the cleithrum and perhaps the urohyal. Other elements are the priapal ribs, the anteplural cartilage (supporting elements along with the cleithrum and the pulvinar), the toxactinium, the infrasulcar and the uncus (forming the claspers along with the ctenactinium), the penial, basipenial, papillary, prepapillary and cristate bones (forming the papillary unit).

prick butts = to stalk flatfish at the ebb tide (Norfolk dialect).

pricking = the process of piercing the swimbladders of deep water fish, especially cod, before placing the fish in the well.

prickle = a small sharp spine, modified from a scale, e.g. in Liparidae, *Cottus*.

priest = a short club used by anglers to stun or kill fish.

primary bone = bony tissue deposited where bone did not exist before.

primary collection = specimens in a museum collection meant to held in perpetuity.

primary consumer = a fish that feeds on the lowest level of a community's food web, namely plants. Also called first-level consumer.

primary female = a female genetically determined at birth or hatching and not the result of a sex change. See primary male.

primary food = the most important food in the diet of a fish.

primary freshwater fishes = those strictly intolerant of salt water, e.g. Dipnoi, Polypteridae, Osteoglossidae, most Cyprinidae, Characidae, most families of Siluroidei, Centrarchidae, Percidae, Percopsidae, Dalliidae.

primary homonym = the two or more identical species-group names applied to different taxa in the same nominal genus when first published.

primary host = definitive host (the fish in which a parasite passes its adult or reproductive phase. Also called final host).

primary male = a male with a normal and permanent testicular component in contrast to a secondary male which develops testicular tissues as ovarian tissue regresses, e.g. the usual state in fishes but very rare in many populations of *Rivulus marmoratus* (Cyprinodontidae). See hermaphroditism and primary female.

primary mandible = Meckel's cartilage (the functional lower jaw of Elasmobranchii and Holocephali, the embryonic lower jaw of other gnathostomous vertebrates which ossifies at least in part as the mentomeckelian, mediomeckelian, coronomeckelian, articular and retroarticular. It remains in some adult fishes as a pointed rod embedded in the dentary and angular. Also called mandibular cartilage and ceratomanibular cartilage. See also Bridge's ossicles).

primary motoneuron = spinal motoneurons innervating body wall muscles. These are large, develop early and are present in 3-4 pairs per spinal segment.

primary osteon = a vascular canal surrounded by concentric bone lamellae, nor depending on previous resorption.

primary phase = the first adult colour phase of a sexually dichromatic fish. Also called initial phase.

primary product = a fish product with the highest recovery rate, e.g. fillets.

primary radius = a radius on a fish scale extending from the focus to the scale margin. Secondary radii do not extend the full distance.

primary sex characteristic = the ovaries and testes, determining the sex of a fish.

primary type = an obsolete term in nomenclature for the specimen on which a new species-group name is based. Also called proterotype.

prime = 1) the more expensive kinds of fish.

prime = 2) the verb for priming behaviour.

prime = 3) a quality or cure of dried and salted cod.

prime = 4) inshore waters rich in cod (Newfoundland).

priming behaviour = fish breaking the water surface, gulping air. Often seen prior to feeding behaviour at dusk. See also porpoising.

priming of tide = the periodic acceleration in the time of occurrence of high and low waters due to changes in the relative positions of the Sun and Moon.

primitive character = a character or character state possessed by an ancestral species; a plesiomorphy.

primogyne = the primary type female of a species.

primordia = plural of primordium.

primordial granule = the initial component of the otolith primordium. Several primordial granules may occur in each primordium composed of vaterite in sagittae with the rest of the primordium aragonite.

primordium (plural primordia) = granular or fibrillar material surrounding a dense nucleus in the otolith, 0.5-1.0 µm in diameter. One to several primordia may fuse to form the otolith core.

primordium of the lateral line = a placoidally-derived rudiment of the posterior lateral line. Used to define stages during the pharyngula period as it migrates posteriorly through the skin overlying the horizontal myosepta, depositing neuromast primordia along its route.

principal caudal ray = see principal ray.

Principal Components Analysis = a method of transforming the axes of multidimensional space in which data occur so that the first axis explains the maximum amount of variance, the second axis, which is orthogonal to the first, explains the maximum of the remaining variance, and so on. The first 2 or 3 principal components explain most of the variance.

principal man = the man in charge of a fishing boat or with special skills and experience (Newfoundland).

principal ray = a large ray, branched or unbranched, larger than the minor or rudimentary rays. In the caudal fin the principal rays are usually attached to the hypural plates, are larger than the rudimentary rays; and usually include, in adults, the branched rays + 2. See also main rays.

principal species = species important to the viability of the fishery, both target and non-target.

Principle of Binomial Nomenclature = the principle that the scientific name of a species, and not a taxon at any other rank, is a combination of two names (a binomen, *q.v.*); the Principle also applies to the trinomen (*q.v.*) and uninominal names for taxa above the species group.

Principle of Continuity = uniformitarianism (the present is the key to the past. The physical and biological factors which link today's variations must have been in operation in the past).

Principle of Coordination = the principle that within the family group, genus group or species group a name established for a taxon at any rank in the group is deemed to be simultaneously established with the same author and date for taxa based on the same name-bearing type at other ranks in the group.

Principle of First Reviser = see first revisor.

Principle of Homonymy = see homonymy.

Principle of Priority = the valid name of a taxon, with certain exceptions and limitations, is the oldest name applied to it (provided that the name is not invalidated by any provision of the International Code of Zoological Nomenclature or by any ruling by the International Commission on Zoological Nomenclature).

Principle of Typification = the principle that each nominal taxon in the family group, genus group or species group has, actually or potentially, a name-bearing type fixed to provide the objective standard of reference by which the application of the name is determined.

printed matter = a phrase describing text and/or illustrations printed in quantity and permanent form. Each letter of text and each illustration is formed from a fabricated master.

printed on paper = a phrase describing text and/or illustrations printed on paper using wet ink from a prepared surface, e.g. typeface, lithographic stone, woodblocks. Photography using light-sensitive paper is not included in this definition.

printer's error = an incorrect spelling made in type-setting (often called typographical error). Such errors may have significance in nomenclature.

priorable name = a name that is established and is to be taken into account for purposes of determining the accepted name of a taxon.

priority = the valid name of a taxon is usually the oldest name applied to it; seniority fixed by date of publication (availability).

prismatic calcified cartilage = a special type of hard tissue lining the cartilages of the chondrichthyan endoskeleton.

pristane = a hydrocarbon in the liver oil of sharks used in manufacturing machine lubricants and skin softeners.

pristine = an unaltered and undisturbed fish habitat.

pristine population = virgin population (utilised stock (the part, by number, of the fish alive at a given time, which will be caught in the future)).

pristis = pistris.

pristix = pistris.

pro = short for professional as in professional fisherman who sport fishes for a living.

pro- (prefix) = before, in front of, forward.

*pro minore parte* = for the smaller part. Abbreviated as *min. parte*.

*pro parte* = in part, used in author citations to show that only part of a taxon, as defined by a previous author, is being referred to by the writer. Abbreviated as *p. p.*

*pro sp.* = abbreviation for *pro specie*.

*pro specie* = as a species. Used in citations to indicate either that a binary name regarded as that of a hybrid was originally published as that of a species, or as a synonym of another. Abbreviated as *pro sp.*

proadge = to move the end of a fishing rod up and down gently in the water (*sic*) to lure the fish to the fly (Scottish dialect). Also spelled prodg, progj and prooge.

proatlas = the vertebral face on the posterior end of the basioccipital where the skull articulates with the first vertebra.

proboscis = elongated, flexible extension of the snout, e.g. in some Chondrichthyes.

procælian = concave in front.

process = any projection from a body such as a bone. Apophysis, condyle, head, tuberosity, etc. are all processes.

processed fishery product = any fish product that has undergone some process, chemical or physical, to further prepare it, e.g. salting, smoking, drying, marinating, freezing, etc.

processing = the receiving and preparation of fish, including cleaning, cooking, canning, smoking, salting, drying, or freezing.

processus articulares = plural of processus articularis.

processus articularis (plural processus articulares) = articular process (a projection of the upper border of the premaxilla acting as a fulcrum for the protrusion of the maxilla).

processus ascendens (plural processus ascendentes) = ascending process (a vertical process on the anterior part of the premaxillary bone in most teleosts. Not homologous with a similar structure in Holostei (*Amia* and *Lepisosteus*), called the nasal process).

processus ascendentes = plural of processus ascendens.

processus coronoidei = plural of processus coronoideus.

processus coronoideus (plural processus coronoidei) = coronoid process (a dorsal hump on the dorsal wing of the dentary, or on the angular or on the posterior end of Meckel's cartilage).

processus dentiformis= a tooth-like projection at the symphysis of the upper jaw in Balitoridae. It may fit into a notch in the lower jaw. Also called dentiform process.

processus nasales = plural of processus nasalis.

processus nasalis (plural processus nasales) = nasal process (a vertical process on the anterior maxillary bone in Holostei (*Amia* and *Lepisosteus*), not homologous with a similar structure in most teleosts called the ascending process).

processus postmaxillares = plural of processus postmaxillaris.

processus postmaxillaris (plural processus postmaxillares) = postmaxillary process.

processus quadratojugales = plural of processus quadratojugalis.

processus quadratojugalis (plural processus quadratojugales) = quadrotojugal process (a process on the quadrate formed by the fusion of the quadratojugal to the quadrate after its initial independent ossification, e.g. in *Salmo* and *Syngnathus*).

processus spinosi dorsales = plural of processus spinosus dorsalis.

processus spinosus dorsalis (plural processus spinosi dorsales) = neural spine (the dorsal spine on top of the neural arch, directed backwards. These spines are bifid posteriorly in Diodontidae. Also called neuracanth and neurapophysis).

processus spinosus inferior (plural processus spinosi inferiores) = haemal spine (a spine extending downwards from the lower end of the haemal arch in posterior or caudal vertebrae. Also called haemacanth and haemapophysis).

processus spinosi inferiores = plural of processus spinosus inferior.

processus spinosi ventrales = plural of processus spinosus ventralis.

processus spinosus ventralis (plural processus spinosi ventrales) = haemal spine (a spine extending downwards from the lower end of the haemal arch in posterior or caudal vertebrae. Also called haemacanth and haemapophysis).

proctal fin = anal fin (the median ventral fin or fins behind the anus. Abbreviated as A, or A1 and A2 if there are two. Also called proctopterygium, it functions to maintain equilibrium against rolling).

proctal axial or pelvic = the basal bone of the priapium, q.v., a copulatory organ in the Phalostethidae.

proctopterygia = plural of proctopterygium.

proctopterygium (plural proctopterygia) = anal fin (the median ventral fin or fins behind the anus. Abbreviated as A, or A1 and A2 if there are two. It functions to maintain equilibrium against rolling).

procumbent = leaning forward.

procurent = inclined forward.

procurent ray = one of a series of small, unsegmented rays on the dorsal and ventral edges of the caudal fin.

procurent spur = a ventrally projecting spur on the posteriormost ventral procurent caudal ray overlapping ventrally the preceding ray in various percomorphs (Johnson, 1975).

prodg = proadge.

produce = fish resulting from the use of natural resources.

produced = elongate, projecting, extended.

product recovery rate = the ratio expressed as a percentage of the weight of processed product divided by the round weight of fish used to produce that amount of product.

product risk group = in fish inspection, fish products which share common risks related to processing, packaging, storage conditions, shelf life and intended consumption.

production = 1) the total elaboration of new body substance in a stock in a unit of time, irrespective of whether or not it survives to the end of that time. Also called net production, total production.

production = 2) yield (Ricker, 1975).

production = 3) total annual catch in weight.

production capacity = the capacity of a water body or production facility to produce fish.

production expansion factor = the total number of fish released from a hatchery divided by the number of tagged fish released. Used to estimate hatchery contribution to a stock and fish survival rate.

production model = a population model that describes how biomass changes from year to year or how biomass changes in equilibrium as a function of fishing mortality. Three or four simple parameters are used in a deterministic model. Production models are used primarily in simple data situations where total catch and effort data are available but age-structured data is unavailable or less reliable.

production pond = a large pond where fingerlings are raised to marketable size.

productivity = a measure of the capacity of a biological system, the amount of fish supported or produced by a given area in a given time. Also used as a measure of the efficiency with which a biological system converts energy into growth and production. A highly productive stock of fishes has high birth, growth and mortality rates resulting in high turnover and production to biomass ratios. Such a stock can be exploited fully and can recover more easily if depleted.

proethmoid = one of the paired dermal bones resting behind on the frontals and in front on the cartilage above the prevomer, e.g. in Esocoidei.

profanotype = a joke term in nomenclature for a type with an offensive or obscene name.

professional breeder = brood fish spawning several times in a year.

professional overrun = a tangle of line from a reel's overrun. Also called backlash or professional spaghetti.

professional spaghetti = a tangle of line from a reel's overrun. Also called backlash or professional overrun.

profile = 1) the outline of the head from the snout to the occiput or to the front of the dorsal fin, as viewed from the side.

profile = 2) the outline of a fish in silhouette, often characteristic of a taxon.

profile = 3) the outline an artificial fly presents to a fish, ideally duplicating a natural food item.

profundal zone = the zone in lakes including all of the basin floor in contact with the hypolimnion, below the depth of effective light penetration.

prog = oil from rendered fish livers poured over fish at a meal, or into which fish are dipped. Also refers to fish and potatoes eaten with liver oil.

progenic = a type of serial tooth replacement where the teeth develop on the anterior edge of the jaw, then move posteriorly into functional position, e.g. *Girella nigricans* (Girellidae)(opposite to the condition in Elasmobranchii).

progging = fishing for eels hidden in holes with a stocking needle fastened by the eye to the end of a willow wand, and to the middle of it is tied a long string. The free end is baited with a worm. This is then pushed into the hole. As soon as the eel has taken the bait, the fisherman pulls the string, reversing the needle and so capturing the eel (Northumberland dialect).

progj = proadge.

proglacial = features of glacial origin beyond the limits of the glacier, e.g. a meltwater stream.

prognathous = 1) having jaws that project forward markedly.

prognathous = 2) having a projecting lower jaw. See also hypognathous.

progressive count = a count of anglers or boats as a recorder moves through a fishery.

progressotype = a joke term in nomenclature for a type whose habitat has been overtaken by urbanisation so that the species is probably extinct.

prohibited species = any species of fish that a vessel is not specifically allocated or authorized to retain, including fish caught or received in excess of any allocation or authorization.

projection = a measure of how the stock and fishery will behave in the future. Used to support decisions in respect of quotas over the short term of 1-4 years. Longer term projections are not as accurate.

prolarva = larva still bearing yolk (Hubbs, 1943).

proliferative gill disease = a disease of farmed freshwater fish, mostly in new ponds, caused by a myxosporidean parasite (*Henneguya exilis*, or possibly the myxozoan *Sphaerospora ictaluri* or *Aurantiactinomyxo*). Cysts develop on the gills causing respiratory distress as well as various internal organs. Also called hamburger gill disease.

proliferative kidney disease = a temperature-dependent disease of salmonids from a myxosporean protozoan causing gross changes in the kidney. Fish become dark in colour, anaemic and show abdominal swelling. Growth is slowed and loss of stock is catastrophic once another stressor is introduced. Abbreviated as PKD.

prolonged speed = sustained speed (the swimming speed that a fish can maintain for prolonged periods but ultimately tires and shows some degree of stress).

promiscuous = free spawning and not restricted to a single sexual partner, e.g. livebearers.

promontory = a high point of land extending into water; a headland.

pronephros = the type of kidney found in the anterior part of the body cavity with only one pair of tubules per somite; found in adult Myxini, a few adult Teleostomi, and embryos of other fishes and tetrapods; the fore-kidney or head kidney.

prong (noun) = 1) a long-handled fork with one or two sharp tines used to transfer fish from one place to another (Newfoundland).

prong (verb) = 2) the process of using a prong (Newfoundland).

prood = proud (Scottish dialect).

prooge = proadge.

protoic = the anterior, deep dermal bone of the otic capsule. In *Amia* it is the only bone of the otic capsule.

prop bait = in angling, a topwater plug that has one or more propellor-like spinning blades at either end or in the middle of its body. The rotation of these props splash the water surface on retrieval.

propagation = to increase the number of fish by various methods from a parent stock.

proportional quota = a fishing quota made proportional to the total allowable catch instead of an exact amount. As the TAC varies so does the amount of fish that can be caught by a quota holder.

proposal = 1) an action, whether successful or unsuccessful, to establish a nominal taxon or name or to carry out a nomenclatural act. Also called *propositus*. Abbreviated as prop.

proposal = 2) an application to the International Commission of Zoological Nomenclature for the adoption of a part of the List of Available Names in Zoology. Also called *propositus*. Abbreviated as prop.

*propositus* = proposal.

propterygia = plural of propterygium.

propterygium (plural propterygia) = the anterior basal cartilage of the paired fins of Elasmobranchii, Holocephali and primitive Teleostomi. It is often the shortest of the three basal cartilages. In skates and rays the pectoral propterygium is elongated anteriorly to support the numerous radial cartilages of these greatly expanded fins.

proscapula = cleithrum.

prosecute = to engage in fishing.

prosencephalon = the forebrain, one of three regions in the developing brain. Details of the brain structure of a fish (*Danio rerio*) may be found in Wullmann *et al.* (1996). See also brain.

prospecting = the search for fish stocks in areas thought to be suitable for the species sought and the estimate of the abundance and distribution of that stock.

prostitutotype = a joke term in nomenclature for a type specimen sold to the highest bidder.

protandrous = adjective for protandry.

protandry (adj. protandrous) = sequential hermaphroditism where the fish functions first as a male and then as a female.

protected area = a geographically defined area where conservation is carried out.

protected fish zone = that part of a water body where fish catches are prohibited.

Protected Geographical Indication = a food name in the European Union that has a protected status and can only be used for a product or traditional recipe from a particular area, e.g.

Cornish sardine, *q.v.*, Arbroath smokie, *q.v.*, Scottish Farmed Salmon, Grimsby Smoked Fish, *q.v.*  
Abbreviated as PGI.

protected name = *nomen protectum* (a protected name applied to a name which has been given precedence over its unused senior synonym or a senior homonym relegated to the status of *nomen oblitum*).

protection piece = chafing gear (any materials attached to wear points on nets).

protective food = in aquaculture, food which contains the essential requirements for growth and maintenance.

protein concentrate = a flour comprised of dried and powdered fish used as a food supplement. It is odourless, tasteless and has more protein than in the original fish flesh. Abbreviated as FPC.

protein efficiency ratio = the ratio between the amount of proteins consumed and production, production per unit of protein fed.

protein skimmer = an aquarium chemical filtration system which removes dissolved organic compounds and microscopic particles. Many small bubbles are sent through a column of water, forming a foam, to separate dissolved organic compounds from the water. The compounds and particles stick to the bubbles and are carried to the top of the unit where they are collected in a removable cup. They come in four varieties, downflow, venturi, counter-current, and co-current and are only really effective in salt water. They may be placed in the tank, hung on the side, or placed in a sump. Also called a foam fractionator.

protein-depleted diet = in aquaculture, a feed with insufficient content of proteins; also a protein-free diet.

protein-free diet = in aquaculture, a feed not containing protein.

proterocercal = the type of tail fin primitively symmetrical, both internally and externally, and hence one which has not undergone reduction or modification of the original form, e.g. in Petromyzontiformes. Also called protocercal.

proterocercy = condition in a proterocercal tail.

proterogynous hermaphrodite = organism first female, later changing to male, e.g. *Epinephelus guttatus* (Serranidae).

proterotype = 1) an obsolete term for a primary type (*q.v.*).

proterotype = 2) all the original specimens collected at one time from which the type(s) were selected.

proto- (prefix) = first, original, earliest.

proto-larva = a larval phase in which distinct median fin elements are not yet apparent.

protocercal = proterocercal.

photograph = 1) the original illustrations of a holotype.

photograph = 2) the single illustration of a primary type made by the author of the name at the time of its original description.

protogynous = adjective for protogyny or a proterogynous hermaphrodite.

protogyny (adj. protogynous) = organism first female, later changing to male, e.g. *Epinephelus guttatus* (Serranidae). Divided into two types functionally, monandry where all males develop from functional females by sex change and diandry where there are two possible pathways. The two pathways of diandry are adult sex change as in monandry and also by direct male development from the juvenile phase with no adult sex change.

protologue = everything associated with a scientific name when it was made available, i.e. the text and illustrations with all the included data involved in a scientific description.

protonym = in taxonomy, a name that is not validly published but is re-used and validly published.

protopterygio-larva = a larva in the interval between the transition of exogenous feeding and the commencement of differentiation of embryonic median finfold (the first appearance of mesenchymatic buds of lepidotrichia and dorsal and anal fin outlines within the finfold).

protopterygium = one of the three basal cartilages of the pectoral fin in the sharks and rays along with the protopterygium and mesopterygium, both q.v.

prototype = 1) a primary type.

prototype = 2) the most primitive representative of a group; the hypothetical ancestor.

*prototypus* = prototype (1).

protractile = capable of being retracted, as of the upper jaw.

protractor post-temporalis mechanism = a sound-producing mechanism in certain catfishes, e.g. Bagridae. A muscle runs from the neurocranium to the anterior margin of the post-temporo-supracleithrum which is directly associated with the anterior process of the 4th parapophysis which in turn is closely associated with the gas bladder wall. Movement of this muscle would vibrate the gas bladder and produce sound. See also drumming muscles and elastic spring mechanism.

protrusible = capable of being protruded, extended or thrust out, e.g. the upper jaw or both jaws project forward to form a tube or scoop-like cutting surface.

protoype = an unofficial term in nomenclature for a good specimen which supplants a fragmentary holotype. Also called proxy type. See also epitype.

*prototypus* = prototype.

proud = said of fish slow to take the bait, difficult to catch or elusive (Scottish dialect).

prove = 1) to stop at any place at sea in order to make a trial for fish.

prove = 2) to sample a net; rather than pull up a long train of nets, a sample of nets nearest the boat is pulled up to see if there are any fish present.

proverbs = see under Quotations as the letter Q lacks piscine entries.

provision = in nomenclature, a term equivalent to a rule.

provisional quota = a temporary allocation of catch to fishermen in proportion to their fishing history. Instigated when a new system is being introduced and may require the government to buy up some provisional quotas so that the total quota issued equals the desired total allowable catch.

proximal = situated towards the base or toward the body; inner, nearest, basal. Opposite of distal.

proxy type = prototype.

pruive = prove (1) and (2) (Scottish dialect).

psammic = adjective for psammon.

psammon = organisms growing on, in or moving through sand.

psammonic = adjective for psammon.

psammophil = 1) a reproductive guild (*q.v.*) of a sand spawner characterised by adhesive eggs scattered in running water on sand or fine roots over sand, having free embryos without cement glands, being phototropic, having feebly developed respiratory structures, large pectoral fins and large cupulae, e.g. *Percina caprodes* (Percidae).

psammophil = 2) a reproductive guild (*q.v.*) of a sand nester having a thick adhesive chorion with sand grains gradually washed off or bouncing buoyant eggs. Free embryos lean on large pectoral fins and embryonic respiratory structures are feebly developed, e.g. *Pseudogobio rivularis*.

psammophilic = sand-loving.

psammophilous = sand-loving.

pseudacanth = a false fin spine; a hard-ray; a spine-like ray which develops from a soft ray and acquires a stiff and pointed character. Pseudacanths are found in certain groups of fishes amongst the Malacoptygii which lack the spinous rays found in many Acanthopterygii, e.g. Notacanthidae, *Cyprinus* (Cyprinidae), *Ictalurus* (Ictaluridae).

pseudo-albinism = hypomelanosis (lack of pigmentation, e.g. on the eyed side of some individual flatfishes, cf. hypermelanosis).

pseudo-apron = apron-like vertical ridges on lateral and posterior teeth in some Chondrichthyes (Herman *et al.*, 1994).

pseudo-osteodont = the former pulp cavity of an originally orthodont histotype (*q.v.*) of chondrichthyan tooth being filled secondarily with osteodentine (Herman *et al.*, 1994).

pseudobathyal zone = Antarctic trenches with a depth of 1000-1600 m separated by sills from the true bathyal zone. Areas of isolation and evolution for notothenioids.

pseudobranch = pseudobranchia.

pseudobranchia (plural pseudobranchiae) = a small gill (a hemibranch) found on the inside of the gill cover near the base. Despite the prefix pseudo it appears to be serially homologous with the other gills. Also called the hyoidean hemibranch or opercular gill. A spiracular pseudobranch may be found in the spiracle. The pseudobranch may be involved in hormonal activations or carbonaceous secretions.

pseudobranchiae = plural of pseudobranchia.

pseudocartilage = tissue found in mental and mandibular barbels of catfishes and in strips attached to the associated intermandibularis posterior muscles. It is composed of large oval cells lying close together with an homogenous interstitial matrix.

pseud caudal fin = gephyrocercal fin (a secondary condition of symmetry in the caudal fin where the original caudal fin has been lost and the interval is bridged by caudal elements. Symmetrical internally and externally, e.g. *Mola*, *Fierasfer*, *Carapus*. Sometimes applied to any secondary internal symmetry).

pseudoceanic = fish that are members of an oceanic group found over the continental slope and shelf and near islands and are associated with land-orientated food chains.

pseudocasper = one or more pairs of stiff ossified lobes or prongs found in the tip of the intromittent organ of Bythitoidei.

pseudocleaner = a mimic of a cleaner fish that attacks fish attracted to a cleaner station, taking scales and fin pieces, and then hiding in a shelter.

pseudocompound = a name or epithet combining elements from two or more Greek or Latin words.

pseudoextinction = the apparent disappearance of a taxon, not due to the death of all members, but to the evolution of novel features in one or more lineages. As a result, new clades are not recognized as belonging to the paraphyletic ancestral group, whose members have ceased to exist.

pseudofin = one of the small fin-like horizontal flaps, folding toward the midline on the side of the caudal peduncle of some juvenile scombrids between about 32-200 mm. The flaps are supported by flexible rays and are later replaced by ridges, e.g. *Auxis*.

pseudofulcrum = a forked dermal ray formed of scales which lie at the front of fins of teleosts such as *Doras* and *Synodontis* (Siluriformes) and which are not homologous with the fulcra of Acipenseriformes.

pseudogenotype = any species absent from an originally described genus, which was later designated as the type species of that genus.

pseudogenus = an artificial assemblage of species for the temporary convenience of treating a particular character or set of characters, e.g. pseudogenera based on the morphology of male claspers in sharks and rays. Pseudogenera have been named but as a means of temporary reference they are not for formal taxonomic use as scientific names.

pseudohyal = coalesced hyoid rays in Rajidae as the ventral elements of the hyoid arch are reduced or absent.

pseudomonadal septicaemia = a haemorrhagic systemic bacterial disease of fishes caused by *Pseudomonas* spp. that can occur at any time but particularly in spring.

pseudonym = use of a false or assumed name, formerly ruled as unacceptable in taxonomy and nomenclature.

pseudosymphysial = a parasympophysial tooth row placed in the position of the symphysial tooth row in Chondrichthyes (Herman *et al.*, 1994).

pseudotaxa = plural of pseudotaxon.

pseudotaxon (plural pseudotaxa) = apparently subordinate taxa which cannot be so subdivided and so cannot be classified.

pseudotissue = a gelatinous layer found between the body proper and the skin. Most often found in bathypelagic fishes; may represent a flotation mechanism, e.g. in *Careproctus* (Liparidae), *Melanostigma* (Zoarcidae).

pseudotympanum = a translucent, triangular area in the humeral region on the side behind the gill cover where the muscles are missing and the anterior part of the gas bladder is directly in contact with the skin, which is hypothesised to improve the hearing in many very young characoids and persists in some adults, notably the Cheirodontidae.

pseudotype = 1) any duplicate of a type specimen not studied by the describer of a new taxon for the taxon description.

pseudotype = 2) the type of a genus-group name which has been erroneously designated.

PSU = psu.

psu = practical salinity unit.

psychric = referring to low temperatures or cold habitats.

psychro- (prefix) = cold.

psychrophilic = cold-loving. Opposite of thermophilic.

psychrotolerant = organisms best suited to higher temperatures (20-40°C) but able to tolerate cold conditions.

pt = abbreviation for pint (473.17 cm<sup>3</sup>, U.S. liquid).

pt(<sub>BI</sub>) = abbreviation for pint (568.26 cm<sup>3</sup>, Imperial).

pt, dry = abbreviation for pint (550.6 cm<sup>3</sup>, U.S. dry).

pterosphenoid = the paired, deep, endochondral bone roofing the skull lying under the frontal, and posterior to the orbitosphenoid. Mislabelled alisphenoid and pleurosphenoid but these bones in mammals and reptiles respectively are not homologous.

pterotic = the paired, deep, endochondral bone and the superficial dermal bone covering it in Actinopterygii forming the lateral roof of the skull between the parietal and the hyomandibular, covering the ampulla of the horizontal semicircular canal. Also called autopterotic, which is strictly used for the endochondral element. In *Amia* it is a paired dermal bone carrying a sensory canal and occupying the dorsal side of the otic capsule. Also called squamosal or squamous but this tetrapod bone is not homologous (but see squamosal).

pterotic spine = a pointed process of the pterotic bone.

pterygial = a bony rod supporting the rays of the paired fins.

pterygio-larva = a larva from the beginning of differentiation of unpaired fins until the embryonic median finfold is entirely differentiated or no longer apparent.

pterygiophore = the cartilage or bone on the outer end of which sit the median fin rays or spines and to which are attached erector and depressor fin muscles. There may be three cartilages that ossify into proximal, median and distal pterygiophores (or axonost, mesonost and baseost or epibaseost). The distal pterygiophore is the one next to the fin. When there are only two pterygiophores these are termed proximal and distal. In some fishes the proximal pterygiophore is very elongate and is known as a basal. Basals may be elongate enough to reach and fuse with the vertebrae, e.g. in *Hippocampus*. Proximal pterygiophores of the dorsal fin are also called interneurals and of the anal fin interhaemals. The last dorsal fin pterygiophore is named a stay. Vestigial pterygiophores anterior to the dorsal fin are called predorsals (or supraneurals although these are derived from neural spines).

pterygiophori = plural of pterygiophorus.

pterygiophorus (plural pterygiophori) = pterygiophore.

pterygoid = a paired dermal bone between the autopalatine and the endopterygoid in the roof of the mouth (of the palatoquadrate). See also ectopterygoid.

pterygopodial gland = a gland of uncertain function at the base of the clasper in skates and rays, occupying the position of the siphon of other Elasmobranchii.

pterygoquadrate = the pterygoid and quadrate bones or cartilages (both *q.v.*).

pterygoquadrate bar = palatoquadrate.

ptychopterygium = the low adherent type of paired fin connected with a broad base to the body as in *Cladoselache*.

pubic bone = innominate bone (the pelvic fin bone in Gasterosteidae, sometimes a misnomer for the ectocoracoid. Also called pelvic bone, pelvic plate, posterior process and medial plate).

publication (noun) = 1) any published work.

publication (verb) = 2) distribution of printed matter through sale, exchange or gift such that it enters the public domain.

publication = 3) according to the International Code of Zoological Nomenclature a work is published when first issued when it is reproduced in ink on paper by a method assuring numerous identical copies, is issued for the purpose of scientific public permanent record, is obtainable by purchase or free distribution and is not reproduced or distributed by a method forbidden by the Code (micro-films, microcards or similar methods; distribution to colleagues or students of a note, even printed, in explanation of an accompanying illustration; proof sheets, mention at a meeting; labeling specimen in a collection; deposit of a document in a library; after 1950, anonymous publication).

publication date = in nomenclature the date of publication follows the author name and a comma (,).

publish = see publication.

published name = any name which is printed and circulated, i.e. meets the criteria of publication as stated by the International Code of Zoological Nomenclature; may be available, unavailable, valid or invalid.

publishotype = a joke name in nomenclature for a holotype described after rumours of staff cuts.

puboischiadic bar = both halves of the pelvic girdle in Elasmobranchii fused into a single ventral bar.

puboisquiadic bar = misspelling of puboischiadic bar.

puddick = the intestines of a fish, especially the stomach (Newfoundland). Also called puttack or puttock.

pudding = fish ball (fish don't have balls but are sometimes made into them. A ball of shredded white fish or cod and mashed potatoes, flour or other binding material, usually fried. Also called fish dumpling. See also catfish ball and ball).

puddle cast = in fly fishing, a cast that leaves slack line on the surface allowing the fly to float without drag.

Puerto Rico = a grade of dried and salted cod prepared for the market in Puerto Rico (newfouindland).

PUFA = abbreviation for polyunsaturated fatty acids.

puffer poison = combined with extracts of the plant *Datura*, used to produce zombies in the Caribbean.

puffer poisoning = tetrodotoxification, *q.v.*, poisoning caused by eating tetrodotoxic fishes.

pugheadedness = an anomaly of fishes in which the snout is shortened and rounded.

pull bait = in angling, a type of jerk bait designed to be fished with steady pulls.

pull guts = removing the head and entrails of a fish (Newfoundland).

pull net = any net where fish are caught by horizontal dragging, e.g. seine, trawl, scoop net.

pull-line = a rope used to raise a line or net to the surface.

pull-rope = length of line forming part of a castnet and used to draw the tucks together, thus closing the net.

pulp cavity = a cavity inside a tooth from which vascularisation is spread via canaliculi (Herman *et al.*, 1994).

pulpit = a railed in portion on the bowsprit of a ship, used as a standing-place for harpooning swordfish.

pulse fishing = harvesting a stock of fish, then moving on to other stocks or waiting until the original stock recovers.

pulvinular bones = the outer and inner bones which suspend proctal pelvic bone from the cleithrum in the priapium of Phalostethidae. The inner pulvinular is absent in some genera.

pulvinulus = an elongate mass of fibrous tissue at the base of the toxactinium in the priapium (*q.v.*) of Phalostethidae.

pumie = the remains after pressing herring for oil; used as a fertiliser. Also called rack

pump = a fish pump is a mechanism for transferring large volumes of relatively small fish in water from a net into a ship by means of a pump and associated flexible pipes while a fishing pump is used to catch fish attracted by lights, but not to transfer fish already caught.

pump fishing vessel = a vessel with a pump that is lowered under the surface of the water. Small fish, attracted by light from a lamp situated above the suction side of the pump, are sucked and pumped with water on board where a fish separator is installed.

pumping = in angling, the process of raising and lowering a rod; it allows slack line to develop and be reeled in as the rod is lowered.

punchcard = a card used by anglers to record catch information; it is returned to the management agency after the fishing season.

puncheon = a large watertight barrel or cask used for storing various items including pickled fish. Ninety gallons was the average size in Newfoundland but could be 44-140 gallons. They were often sawn in half to make two puncheon tubs which were used for washing fish in and sometimes for pickling fish, etc. A butt in some places was a puncheon sawn off at the three-quarter mark and used to salt fish as well.

punctate = dotted, with colour or structure, usually with a distinct margin; stippled.

punctuated equilibrium = evolution in rapid bursts followed by long periods without change as opposed to gradualism, *q.v.*

punctuation = having dots or tiny spots of colour.

punctulate = dotted, with colour or structure.

puncture = a small or fine dot.

pungent = sharp but not pointed.

punt = 1) a narrow, long, flat-bottomed boat propelled by a pole (which, when stuck in bottom mud, should not be held on to).

punt = 2) a small, wooden, round-bottomed and open boat used in the inshore fishery of Maritime Canada. Smaller than a skiff at less than 25 feet, may be powered by oars, sails or an engine.

punt (verb) = 3) propelling by a pole.

punting = 1) thrust and glide locomotion, e.g. in Rajidae using the crura of the pelvic fins.

punting = 2) losing a fish while fly fishing.

pup = an embryonic or young shark or coelacanth.

pupa = the stage between larva and adult in insects and also the artificial fly made to imitate them.

pupil = the large opening in the centre of the iris of the eyeball.

pupillary opercula = the irregular lobe(s) of the upper iris which permit it to decrease the size of the pupil by extending the lobes, giving the pupil an irregular shape. May shade or camouflage the eye, e.g. *Ogcocephalus*, *Halieutichthys* (Ogcocephalidae); *Raja clavata* (Rajidae); *Uranoscopus scaber* (Uranoscopidae).

pupping ground = the area where live-bearing sharks give birth to pups, often a shallow marine bay protected from predators. See also birthing ground.

purachina = ornamental carp or koi (q.v.), being a metallic white or platinum fish.

pure line = a genetically uniform strain in which all members have descended by self fertilisation or close inbreeding.

purge = shrink (loss of weight in fish due to fluids draining from the food product. Also called drip).

purified diet = a fish diet of carefully comprised components used only in research.

purified ration = purified diet.

purl = to flow with a rippling sound.

purse cable = purse line.

purse hoop net = a lift net operated by hand and having a line that can be pulled to close the opening of the hoop.

purse line = a line at the bottom of a purse seine which allows it to be closed like a purse.

purse seine = a seine used to encircle a school of fish in open water (contact with the bottom is avoided as the small mesh is easily damaged). It is set at speed from a large, powered vessel and the other end is anchored by a small boat. A purse line at the bottom (bag or bunt) of the net allows it to be closed like a purse. A purse seine can be 1 km long and 200 m deep.

pursing = drawing a purse line closed on a purse seine.

pursing string = purse line.

pursing wire = a wire purse line.

pursuing predator = a fish that actively searches for and pursues prey. See also ambush predator and tracking predator.

push = a school of fish pursuing their course (Yorkshire dialect).

push net = a form of scoop or skimming net (*q.v.*) pushed along the seabed by a fisherman. The ends of the poles on the seabed may have special runners. Some push nets are operated from boats.

push pole = a long pole used for pushing a boat silently through the water, to reach casting range for such as bonefish.

pustule = a pimple, blister-like or wart-like projection.

pustulose = having small pimples, blister-like or wart-like structures.

put = 1) the quantity of fish taken at one setting of a net or trap; and this amount brought ashore (Newfoundland).

put = 2) putt.

put away = to process cod by unloading, splitting and salting the catch (Newfoundland).

put down = in fly fishing, an error in presentation of the fly or any other action that scares the fish so that it swims away or into deeper water.

put-and-take fishery = the placing of hatchery-raised fish of a specific size in waters to be caught by fishermen for a payment. Mostly in fresh waters, rare in the sea.

put-in = 1) the launch area for a boat.

put-in = 2) to turn over a catch of cod to one's supplying merchant for credit (Newfoundland).

put-in = 3) fish appearing in inshore waters (Newfoundland).

put-in pole = a fishing pole made of sections, the base of which fits over the top of the next. Not as strong as put-in poles but lighter and easier to dismantle.

put-over pole = a fishing pole made of sections, the base of which fits into the top of the next. Stronger than put-over poles.

put-up = 1) to spread split cod between layers of salt (Newfoundland).

put-up = 2) to process frozen cod fillets (Newfoundland).

putchen = a wicker eel basket or trap (English dialect). Also spelled putcheon, putchin and putchun.

putcheon = putchen.

putchin = putchen.

putchun = putchen.

putt = 1) a salmon trap (English dialect).

putt = 2) a tapering basket used in making fish weirs on the Wye and Severn rivers of England. Putts are placed in groups of six or nine between pairs of stakes, each group between two stakes is called a puttcher. Also called butt or kype.

puttcher = a group of puts or section of a weir.

puttick = puddick (Newfoundland).

puttock = puddick (Newfoundland).

putty fish = thicker, less salted parts of white fish that have become soft because of bacterial spoilage when temperatures are high and salt penetration low.

PVA = 1) population viability analysis (a quantitative analysis which estimates the extinction probability of a species or population based on the known life history and specified management or non-management options).

PVA = 2) polyvinyl alcohol, a water soluble plastic used by anglers in Europe as bags to hold ground bait or as string for tying on boilies, *q.v.*, or pellets. The bags or strings dissolve gradually in water and release the baits to attract fish. See PVA bag and PVA tape.

PVA bag = a small bag made of polyvinyl alcohol, *q.v.* used to hold bait in angling. The PVA dissolves and releases the bait.

PVA tape = a tape made of polyvinyl alcohol used to tie rig sections together when casting in angling. The PVA dissolves and allows the rig sections to unfold and function.

PVO = photophores below the pectoral fin and above the PO row in Myctophidae.

pyaelick = pelek.

pyalick = 1) the milt bag of a fish (testes) (Shetland Isles dialect).

pyalick = 2) immature fish row (Shetland Isles dialect).

pyalick = 3) pelek.

pycnocline = a layer in a water body where the density increases significantly compared to layers above and below. Includes air-water interface.

pyddle = paidle.

pydle = 1) a cone made of rushes used in catching fish coming down a stream (Scottish dialect).

pydle = paidle.

pyloric appendage = pyloric caecum.

pyloric caeca = plural of pyloric caecum.

pyloric caecum (plural pyloric caeca) = a finger-like out-pocketing of the intestine where it meets the end of the stomach (pylorus). Also spelled cecum (ceca). Serves to aid digestion.

pyloric region = that portion of the stomach next to the intestine.

pyloric sphincter = the valve-like constriction of the intestine immediately behind the stomach, controlling the flow of food from the stomach. Also called pyloric valve.

pyloric valve = pyloric sphincter.

pylorus = the passage from the stomach to the intestine.

pyne = pine.

pyriform = pear-shaped.

## Q

Q = Quaternary geological period.

q = abbreviation for the fraction of a fish stock which is caught by a defined unit of the fishing effort. When the unit is small enough that it catches only a small part of the stock (0.01 or less) it can be used as an instantaneous rate in computing population change. Also called catchability coefficient, *q.v.*

*q* = *q.*

*q.e.* = abbreviation for *quod est*, meaning which is.

*q.v.* = abbreviation for *quod vide*, meaning which see.

qanat = an underground water channel constructed in alluvial fan material to tap the water table and provide a constant flow of water. Mostly found in the Middle East and a habitat there for fishes. Called karez in central Asia and Afghanistan, falaj in Arabia and foggara in North Africa.

ql = quintal (3).

quadriadiate = with four radiating arms or extensions.

quadrate = a paired, triangular, deep, endochondral bone on which the mandible hinges, connecting the lower jaw to the palatine and hyoid arches. During evolution becomes the incus bone of the inner ear of mammals.

quadratojugal = a paired dermal bone behind the quadrate, e.g. in *Lepisosteus* and *Acipenseridae*. It may be an independent ossification, e.g. in *Salmo* and *Syngnathus*. Sometimes called interopercle or preopercle from its position.

quadrotojugal process = a process on the quadrate formed by the fusion of the quadrotojugal to the quadrate after its initial independent ossification, e.g. in *Salmo* and *Syngnathus*.

quadri- (prefix) = four, square, at right angles, fourfold.

quadricuspid = with four points, e.g. a quadricuspid tooth.

quadrinominal = an obsolete term and usage in nomenclature where a scientific name was comprised of four parts, e.g. a variety within a subspecies.

quality management programme = a fish inspection and control system that includes procedures, inspections and records for the purpose of verifying and documenting the processing of fish and the safety and quality of fish processed in, exported from or imported into a country.

quantity = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for smelt.

quap = to rise to a fly; said of trout (Gloucester dialect).

quarantine = in aquaculture, a confined or enclosed system that is designed to prevent any possibility of the release of the species, or any of its disease agents or any other associated organisms into the environment.

quarantine pond = a pond used to isolate diseased or parasitised fish.

quarantine tank = an aquarium set aside from the main aquaria and used to isolate sick fish for treatment or new fish that need to be checked for parasites and diseases. Also called hospital tank.

quark = kwerk (part of the throat of a fish used as bait (Scottish dialect)).

quarkay = kwerk (part of the throat of a fish used as bait (Scottish dialect)).

quarkie = kwerk (part of the throat of a fish used as bait (Scottish dialect)).

quarry = 1) an open pit for mining, often becoming filled with water when no longer mined and stocked with fish.

quarry = 2) an animal hunted or caught for food. Anglers often refer to fish as their "quarry".

quarter cut fillet = fillet from a flatfish where the flesh is taken off in two pieces.

quarter fishing = salmon fishing during the first and last quarters of the moon when fish are supposed to be more plentiful (Scottish dialect).

quarter nape fillet = a fillet of fish with the belly flap removed, essentially boneless.

quarter rope = handling rope used in side trawling to bring the bosom section of the groundrope to the ship's side.

quarter strop = a wire rope fitted with two swivels used in conjunction with the quarter ropes for heaving the mouth of the trawl inboard and securing it.

quasi-anadromous = fish that live in the sea but spawn in estuarine conditions, e.g. tomcod, pink salmon.

quasi-cadromous = fish that live as young in estuaries but spawn in high salinity sea water, e.g. menhaden, mullet.

Quaternary = a geological period of the Cenozoic Era ca. 1.6-0 million years ago comprising the Pleistocene and Holocene (or Recent). Abbreviated as Q.

quay = a solid artificial structure for loading and unloading ships along the water's edge or projecting into the water.

queed = a wooden tub for holding fish (Scottish dialect).

queen of the fishes = a mythical fish or supernatural being in Finland, France and the Balkans. This huge fish guards the fish in inland waters. Depicted as covered in mosses and with fully mature pine tree growing from the back.

queer fish = an eccentric; a term of contempt applied to people (slang).

quennelles = paste prepared from starchy substance, eggs, fat and freshwater fish. Presented in a rolled form and often canned (France).

querd = queed.

querimana stage = the silvery pelagic juvenile stage of Mugilidae.

question mark (?) = used to indicate an uncertain identification of a species or other taxon, or to indicate that a new species is only tentatively assigned to a particular genus - such a name can be validly published.

quick-strike rig = a secondary hook on a short piece of line tied to the main line and its hook. The bait then has two hooks, one at each end. This reduces missed strikes where fish take the end without a hook and more fish are hooked in the mouth rather than swallowing the bait before the hook can be set.

quickwater = a stream or part thereof having a marked current.

quide = queed.

quiddie = queed.

quilter = a very large fish (English dialect).

quin- (prefix) = five, fivefold.

quinaldine = an anaesthetic used for bulk transport of fish in tanks.

quincunx = a set of 5 objects arranged with 4 as the corners of a square and the fifth centrally placed, e.g. lateral line pores in *Nemichthys scolopaceus*; spots on the flank of *Barbus subquincunciatus* are arranged almost like a five in dominoes, but irregularly.

quincuspid = with 5 points or cusps, e.g. a quincuspid tooth.

quintal = 1) an old measure of dried, salt cod for sale, 112 pounds or 50.8 kg. Two quintals was known as a draft or draught in Newfoundland. Also used to quantify large catches so a voyage of 500 quintals represented approximately a quarter million pounds of fresh round fish. Also spelled kental or kintal in Newfoundland.

quintal = 2) a hundredweight, either 112 or 100 pounds, according to the scale used. Also 100 kg or a metric quintal and various values around 100 pounds in different countries.

quintal = 3) also a modern measure equal to 100 kg or 220.46 pounds. Abbreviated as ql.

quiotype = cheiotype (a type specimen of a species designated by a manuscript name).

quiver tip = a very flexible and therefore sensitive tip on the end of a fishing rod used to indicate bites when ledgering, q.v. It may be spliced on, a screw in tip that fits into a special end eye on the rod, or a push in tip that is pushed onto the end of the rod. The quiver tip is set up at a right angle to the line with a slight bend in it attained by tightening the line. If the fish pulls it bends the tip further, if it swims towards the rod the tip straightens out. A black target board with white stripes can be placed on a separate stick behind the quiver tip. It enables the angler to spot any slight tip movement and protects the tip from wind.

quivering = side to side head movements, a sign of courtship in many male fishes, particularly cichlids. The female may or may not respond by doing the same.

quoad = as to, as regards, with respect to, to this extent. Used in citations in taxonomy to indicate which part of a taxon as circumscribed by an earlier author is being referred to by the present author.

quod = to fish for eels using several worms strung on a thread of worsted. The fine teeth of the eels catch in the worsted (compactly twisted woolen yarn). See also clatting.

*quod est* = which is. Abbreviated as *q.e.*

*quod vide* = which see; often used to direct a reader to a comment or other part of a text. Abbreviated as *q.v.*

quota = amount of catch or harvest allocated in a time period by a governmental authority. It may refer to a fishery as a whole or to the amount allocated to an individual (individual quota) or company of the total allowable catch, *q.v.*, from a stock. Also the transferable shares in the total quota for a stock (an individual transferable quota). Quotas may or may not be

transferable, inheritable, and tradable. Can be used also to allocate fishing effort or biomass. Not a trip limit (*q.v.*) although used in this sense by some fishers.

quota hopping = vessels registered in one country, e.g. of the European Union, and fishing against that country's quota, but ultimately owned by a company in another member state, and often landing most of its catch in the owner's country.

quota management = managing the fishery by specifying how much fish may be caught from any given stock and who gets to catch it (by fleets or individuals). Quotas vary so as to keep fishing mortality rate steady. See also allowance.

quota share = a permit with a face value used as a basis for the annual calculation of a person's individual quota.

quotation marks = single quotation marks ('....') may be placed around the species epithet of a domesticated animal to indicate that they are not separated as true species from wild ancestors.

quotations = an arbitrary selection follows and also includes proverbs, aphorisms, rhymes, fragments of show tunes, and ditties (as Q lacks piscine entries). Some other proverbs appear in the letter files:-

1 = "Anaximander says that men were first produced in fishes, and when they were grown up and able to help themselves were thrown up, and so lived upon the land"..... Plutarch. 46 (?) - 120 (?) A. D. Symposiacs, Book viii, Question viii.

2 = "Follow me, and I will make you fishers of men"..... Matthew, 4, 19.

3 = "And Jesus said to them, "Follow me and I will make you fish for people." And immediately they left their nets and followed him"..... Mark, 1:17-18.

4 = "Like a fish out of water"..... attributed to St. Athanasius, A.D. 373.

5 = "All is fish that comes to the net"..... ca. 1520.

6 = "The best fish keep the bottom"..... ca. 1566.

7 = "There are as good fish in the sea as ever came out of it"..... ca. 1573.

8 = "Give a man a fish and you feed him for a day. Teach a man to fish and you feed him for a lifetime"..... Chinese proverb.

9 = "Give a man a fish and he will eat for a day. Teach a man to fish, and he will sit in a boat and drink beer all day"..... modern version of the Chinese proverb.

10 = "Big fish eat small fish"..... Chinese proverb.

11 = "A dried fish cannot be used as a cat's pillow"..... Chinese proverb.

12 = "A fishing-rod has a fool at one end and a fish (or worm) at the other"..... The Indicator, L. Hunt, 1819.

13 = "The fish sees the bait, not the hook; a person sees the gain, not the danger"..... Chinese proverb.

14 = "Schools of fish come to those who wait patiently; if the big ones don't come, the little ones will"..... Chinese proverb.

15 = "We have here other fish to fry"..... Rabelais, c. 1490-1553.

16 = "She is neither fish nor flesh, nor good red herring"..... John Heywood, ca. 1497-1580.

17 = "That great fishpond (the sea)"..... The Honest Whore, 1604, Thomas Dekker.

18 = "The play, I remember, pleased not the million: 'twas caviare to the general"..... Hamlet, 1601, W. Shakespeare.

19 = "A man may fish with the worm that hath eat of a king, and eat of the fish that hath fed of that worm"..... Hamlet, 1601, W. Shakespeare.

20 = "A fish, he smells like a fish; a very ancient and fish-like smell"..... The Tempest, 1611, W. Shakespeare.

21 = "As no man is born an artist, so no man is born an angler"..... The Compleat Angler, 1653, Izaak Walton.

22 = "I am, Sir, a Brother of the Angle"..... The Compleat Angler, 1653, Izaak Walton.

23 = "I love any discourse of rivers, and fish and fishing"..... The Compleat Angler, 1653, Izaak Walton.

24 = "Death is a fisherman, the world we see  
His fish-pond is, and we the fishes be"..... Anonymous, Death's Trade, 17th Century.

25 = "To fish in troubled waters"..... Mathew Henry, 1662-1714.

26 = "Why then send lampreys? fie, for shame!  
'Twill set a virgin's blood on flame.  
This to fifteen a proper gift!

It might lend sixty-five a lift"..... John Gay, To a Young Lady with some Lampreys, from Poems, 1720.

27 = "Lamprey's a most immodest diet:  
You'll neither wake nor sleep in quiet"..... John Gay, To a Young Lady with some Lampreys, from Poems, 1720.

28 = "Haddock, cod, turbot, and ling,  
Of all; the fish i' th' sea, herring's the king,

Up started the flowk and said, here am I,  
And ever since that his mouth stands awry"..... English folk rhyme (flowk being a fluke or flatfish).

29 = "A Scilly ling,  
Is a dish for a king"..... English folk rhyme.

30 = "Never a fisherman need there be,  
If fishes could hear as well as see"..... English folk rhyme.

31 = "When the wind's in the north,  
The skilful fisher goes not forth,  
When the wind's in the south,  
It blows the bait in the fishes' mouth"..... English folk rhyme.

32 = "And angling, too, that solitary vice"..... Lord Byron, Don Juan (1819-1824).

33 = "Of all nature's animated kingdoms, fish are the most unchristian, inhospitable, heartless, and cold-blooded of creatures"..... Mardi, 1849, Herman Melville.

34 = "Some circumstantial evidence is very strong, as when you find a trout in the milk"..... Journal, 1850, Henry David Thoreau.

35 = "Do not tell fish stories where the people know you; but particularly, don't tell them where they know the fish"..... Collected Tales, Sketches, Speeches, & Essays, 1891-1910, Mark Twain.

36 = "And this is good old Boston,  
The home of the bean and the cod,  
Where the Lowells talk to the Cabots,  
And the Cabots talk only to God"..... Springfield Sunday Republican, 14 December 1924, John Collins Bossidy.

37 = "Fish got to swim and birds got to fly"..... Show Boat, 1927, Oscar Hammerstein.

38 = "Oh, the shark has pretty teeth, dear,  
And he shows them pearly white,  
Just a jackknife has Macheath, dear,  
And he keeps it out of sight"..... The Threepenny Opera, 1928, Bertolt Brecht.

39 = "All men are equal before fish"..... Herbert Hoover.

40 = "Don't bargain for fish which are still in the water"..... Indian proverb.

41 = "It is not a fish until it is on the bank"..... Irish proverb.

42 = "Throw a lucky man in the sea, and he will come up with a fish in his mouth"..... Saudi Arabian proverb.

43 = "Fuel is not sold in a forest, nor fish on a lake"..... Chinese proverb.

44 = "Govern a family as you would cook a small fish - very gently"..... Chinese proverb.

45 = "To climb a tree to catch a fish is talking much and doing nothing"..... Chinese proverb.

46 = "At high tide the fish eat ants; at low tide the ants eat fish"..... Thai proverb.

47 = "There is an eel under every rock"..... Latin proverb.

48 = "Fish begin to stink from the head"..... proverb in many European countries, Persia and Turkey, meaning all corruption comes from the government or the upper classes.

49 = "Piscis primum a capite foetet"..... Latin for "Fish stinks from the head first".

50 = "Piscis natare doces"..... Latin for "You're teaching fish how to swim"; literally, you are wasting your time.

51 = "Luck affects everything. let your hook always be cast; in the stream where you least expect it there will be a fish"..... Latin proverb (Ovid).

52 = "Fish and guest go bad on the third day and must be thrown out"..... proverb in many European and Asian countries with variations such as the fish and guest being poison, odious, old, wearisome, smelling, stinking, etc. but all giving three days as the limit.

53 = "A fish follows the bait"..... English proverb.

54 = "Dead fish always go with the stream"..... English proverb.

55 = "Fish must swim thrice"..... i.e. in water, sauce and wine, English, Scottish and Polish proverb (butter replacing sauce in Poland).

56 = "It is a courts as it is in ponds; some fish, some frogs"..... English proverb.

57 = "Fish swim best that are bred in the sea"..... English proverb.

58 = "It is no use fishing in front of the net"..... English and Siamese proverb; in the latter the net is a trap.

59 = "Affairs, like salt fish, ought to be a good while a-soaking"..... English proverb.

60 = "Turkeys, carps, hops, pickerel and beer, came into England all in one year"..... English proverb, the year being suggested as 1520.

61 = "There are white flowers on the fisherman's garden"..... Irish proverb, meaning the sea is white with breakers.

62 = "The miser's wedding - a potato and a herring"..... Irish proverb.

63 = "Life to men and death to fish"..... Manx proverb.

- 64 = "One at a time is good fishing"..... Scottish proverb.
- 65 = "All's fish that comes to the net"..... Scottish proverb.
- 66 = "Don't gut your fish till you get them"..... Scottish proverb.
- 67 = "Let every herring hang by its own tail (gills, neck, etc.)"..... Scottish proverb.
- 68 = "Daughters and dead fish are no keeping ware"..... Scottish proverb.
- 69 = "A fish from the river, a tree from the forest, a deer from the mountain, are thefts no man was ever ashamed of"..... Scottish proverb.
- 70 = "Put your hand in the creel, take out an adder or an eel"..... Scottish marriage proverb.
- 71 = "Dry pants eat no fish"..... Bulgarian and Montenegrin proverb.
- 72 = "The fish does not go after the hook, but after the bait"..... Czech proverb.
- 73 = "The fish comes to the rod of him who waits"..... Estonian proverb.
- 74 = "When the fish is in the net it wants to get out; when it is out it wants to get in"..... Estonian marriage proverb.
- 75 = "One gets the fish one fishes for"..... Estonian proverb.
- 76 = "Cheap fish - thin glue"..... Estonian proverb.
- 77 = "If a hunter goes into the forest, put the pot aside; if the fisherman goes to fish, put the pot on the fire"..... Estonian proverb.
- 78 = "The child also is a help, it cleans one fish and eats two"..... Finnish proverb.
- 79 = "Catching one fish is always fishing"..... French proverb.
- 80 = "He fishes on who catches one"..... French proverb.
- 81 = "If one is a bird one is plucked, if a fish one is scaled"..... German proverb.
- 82 = "A woman and a fish speak like two men"..... German proverb.
- 83 = "Women and fish are best in the middle"..... German proverb.
- 84 = "The fish said. "I have much to say, but my mouth is full of water""..... Georgian proverb.
- 85 = "Go to the sea if you would fish well"..... Italian proverb.
- 86 = "Woe to the city in which a fish costs more than an ox"..... Latin proverb.

- 87 = "Men make for the shallows, fish for the deep"..... Latvian proverb.
- 88 = "A fisherman is wise in the morning, a shepherd in the evening"..... Livonian proverb.
- 89 = "A fish bites best on a silver hook"..... Norwegian proverb.
- 90 = "No fish without bones, no woman without a temper"..... Polish proverb.
- 91 = "The fish dies by its mouth"..... Portuguese and Spanish proverb, meaning silence is golden.
- 92 = "Where there is no fish, even the crayfish is deemed fish"..... Russian proverb.
- 93 = "You catch fish in troubled waters"..... Russian proverb.
- 94 = "One fisherman sees another fisherman from afar"..... Russian proverb.
- 95 = "In the pond of lies only dead fish swim"..... Russian proverb.
- 96 = "Good luck is an eel in the pond of fools"..... Russian proverb.
- 97 = "Who owns the shore owns the fish"..... Russian and Ukrainian proverb.
- 98 = "A fisherman's mother seldom dines, a hunter's never"..... Serbian proverb.
- 99 = "The eel escapes quickest when it is held fastest"..... Silesian proverb.
- 100 = "One throws away the baked fish when one sees the fresh fish"..... Burmese proverb.
- 101 = "Water does not enter the heart of a fish"..... Burmese proverb, Shan States, meaning a little brother cannot enter the thoughts of an older one.
- 102 = "Every pond has its fish, every dog has its owner"..... Burmese proverb, Shan States, meaning no one is so poor as to be without possessions.
- 103 = "Fowls in a hencoop and fishes in a net, can all be caught with the hand"..... Chinese proverb.
- 104 = "Swiftly running water is a good place to catch fish"..... Chinese proverb, meaning have your business on a busy street.
- 105 = "There is often a space between the fish and the fish-plate"..... Chinese proverb.
- 106 = "A fish on a wall, like cash, has but one eye"..... Chinese proverb.
- 107 = "Fish see the bait but not the hook, men see the profit but not the peril"..... Chinese proverb.
- 108 = "The fish that gets away is always a large one"..... Chinese proverb, meaning stolen items are always the best; see later too.

109 = "Near putrid fish you'll stink, near epidendrum you'll be fragrant"..... Chinese proverb.

110 = "Govern a great nation as you would cook a small fish"..... Chinese Tao proverb, meaning don't overdo it.

111 = "He who sees the sky in water sees fishes in the trees"..... Chinese proverb.

112 = "The fish that has to live in the water should not make an enemy of the alligator"..... Indian and Sri Lankan proverb.

113 = "It is vain to look for yesterday's fish in the house of the otter"..... Hindi proverb.

114 = "The fish is still in the river, and the woman is pounding chillies" (to eat it with)..... Punjabi proverb, meaning don't count your chickens before they're hatched.

115 = "The flowers of the fig tree, a white-coloured crow, a fish's feet in the water one may see but not what is in a woman's mind"..... Sanskrit proverb.

116 = "Small fish flock where big ones are"..... Japanese proverb.

117 = "No fish in clear water"..... Japanese proverb.

118 = "A fish is larger for being lost"..... in various countries expressed in various ways with various meanings from the literal to the figurative; Turkish, Japanese proverb; see also above.

119 = "The fish that is golden shall swim in the sun"..... Japanese proverb.

120 = "One does not discuss the price of a fish that is still in the sea"..... Kurdish proverb.

121 = "Anything with scales counts as a fish"..... Malayan proverb, meaning accepting what comes to hand.

122 = "Different holes have different fish"..... Malayan proverb, meaning different men have different ways.

123 = "Let the fish be caught, but let not the fish-spear be bent"..... Malayan proverb, meaning act with discretion.

124 = "Fish perish through bait"..... Malayan proverb, meaning men are tempted to ruin by women.

125 = "Wherever there is water there is fish"..... Malayan proverb, meaning there is no smoke without fire. Also in Cambodia.

126 = "The fish gives laws to the fishes"..... Southern Nigerian proverb.

127 = "About a sweet fish there is danger"..... Gold Coast proverb.

128 = "Familiarity is like the sea which kills the fisherman"..... Ugandan proverb.

129 = "So-and-so is a fish from a well"..... Northern Nigerian proverb, meaning a shy man.

130 = "He who knows how to bend the fish-hook, knows how to straighten it"..... Northwest Tanganyikan proverb.

131 = "A traveller does not buy raw fish"..... Southern Nigerian proverb.

132 = "Fish that do not feed on other fish do not get proper nourishment"..... Southern Nigerian proverb.

133 = "Take not the fish from your neighbour's net lest a bone stick in your throat"..... Senegambia proverb.

134 = "Fish follow their river"..... Portuguese South African proverb, meaning people support their own family or tribe.

135 = "Don't rejoice over the finding of decayed fish, for what killed it would have eaten it if it had been good"..... Northern Nigerian proverb.

136 = "When the fish is fresh is the time to bend it"..... Northern Nigerian proverb.

137 = "Cunning does not kill the fish; the killer of the fish is the net"..... Nyasaland proverb.

138 = "A fisherman will die drowned"..... Basutoland proverb.

139 = "The fish in the trap begins to think"..... Swahili proverb in Zanzibar.

140 = "Hunger sleeps in the house of two fishermen"..... Swahili proverb in Zanzibar.

141 = "The real fish is the first one"..... former Portuguese East Africa, meaning be satisfied with the first wife, or with an only child.that has died and no more are born.

142 = "Fish remain in the curves of the river"..... former Portuguese East Africa, meaning men remain where there is peace.

143 = "When a fish is killed, its tail is put in its mouth"..... Southern Nigerian proverb, said of those who reap the fruits of their misfortune.

144 = "He who goes with fish must eat worms"..... Surinam proverb.

145 = "Fishermen never see the fish's stink"..... Georgian proverb, meaning one's own child is good.

146 = "The bigger the fish the more butter him take"..... Jamaican proverb.

147 = "All kind of fish eat man, only shark get blame"..... Jamaican proverb.

148 = "When the bait is worth more than the fish, 'tis time to stop fishing"..... American proverb.

149 = "Your luck ain't always equal to the length of your pole"..... American proverb.

150 = "The size of your fish has made you disloyal"..... Maori proverb, meaning too great luck has made you arrogant.

151 = "Taking an eel by its tail and a woman at her word leaves little in the hand"..... Swedish proverb.

152 = "Rather endure the flatulencies (or gurgling) of the camel than the prayers of the fishes"..... Arabic proverb.

153 = "Those who wear pearls do not know how often the shark bites the leg of the diver"..... Abyssinian proverb.

154 = "The junk capsizes and the shark has his bellyful"..... Malayan proverb.

155 = "You need to bait the hook to catch the fish"..... unattributed proverb.

156 = "All cats love fish but hate to get their paws wet"..... unattributed proverb.

157 = "You can't free a fish from water"..... unattributed proverb.

158 = "Summertime and the living is easy, Fish are jumping, and the cotton is high"..... Porgy and Bess, 1935, Ira Gershwin and Du Bose Heyward.

159 = "Freedom for the pike is death for the minnows"..... Equality, 1938, R. H. Tawney.

160 = "Everything seems beautiful because you don't understand. Those flying fish, they're not leaping for joy, they're jumping in terror. Bigger fish want to eat them. That luminous water, it takes its gleam from millions of tiny dead bodies, the glitter of putrescence. There's no beauty here, only death and decay"..... I Walked with a Zombie, 1942, Curtis Siodmak and Jacques Tourneur.

161 = "This island is made mainly of coal and surrounded by fish. Only an organizing genius could produce a shortage of coal and fish at the same time"..... Speech, 24 May 1945, Aneurin Bevan.

162 = "A woman without a man is like a fish without a bicycle"..... attributed to Gloria Steinem but a graffito of the 1970s, probably by Irina Dunn.

163 = "Democrats eat the fish they catch; Republicans stuff 'em and hang 'em on the wall"..... Sean Donlon, 23 October 1981, Washington Post.

164 = "Fish have water, the bushmen of the Kalahari have sand, and Houstonians have interior décor"..... America: A User's Guide, 1990, Simon Hoggart.

165 = "Caviar comes from virgin sturgeon, Virgin sturgeon's a mighty fine fish,

Virgin sturgeon needs no urgin',  
That's why caviar is my dish!"..... Anonymous.

166 = "Shad roe comes from scarlet shad fish,  
Shad fish have a very sad fate,  
Pregnant shad fish is a sad fish,  
Got that way without a mate!"..... Anonymous.

167 = "The trout is just a little salmon,  
Just half-grown, and minus scales,  
But the trout, just like the salmon  
Can't get on without his tail!"..... Anonymous.

168 = "Give a thought to the happy codfish,  
Always there when duty calls,  
Female cod fish is an odd fish,  
From her come your cod fish balls!"..... Anonymous.

169 = "Who hears the fish when they cry?"..... Henry David Thoreau, 1849.

170 = "To believe that a frog is a fish because it lives in the water" ..... Dominican proverb meaning appearances can be deceiving.

171 = "*Piscem natare doces*" ..... Latin proverb meaning you're teaching a fish to swim.

172 = "A man may fish with the worm that hath eat of a king, and eat of the fish that hath fed of that worm"..... William Shakespeare, Hamlet, Act IV, sc. iii.

173 = "No fog, no fish, out of the fog and into the fat, the more fog, the more fish"..... Newfoundland proverb.

174 = "No curlew, no herring"..... Labrador proverb based on the erroneous belief that curlew ate herring.

175 = "As cold as a cod's nose"..... Newfoundland proverb.

176 = "Codfish is cod by name and by nature"..... Newfoundland proverb.

177 = "No cod, no cash"..... Newfoundland proverb

178 = "Sly as a conner ..... Newfoundland proverb (a conner is the wrasse *Tautogolabrus adspersus*).

179 = "A March-wisher is never a good fisher"..... English proverb from Devon, meaning unknown, but presumably referring to the early season being unproductive

180 = "As dry as a hake"..... English dialect, meaning very thirsty.

181 = "When there are no fish, even a crab is a fish" .... the Russian equivalent to the English proverb "In the land of the blind, the one-eyed man is king".

182 = "Man needs religion like a fish needs a bicycle" ..... also known as Vique's Law.

183 = "I know the human being and fish can co-exist peacefully"..... President George Bush in September 2000, explaining his energy policies.

184 = "Only dead fish go with the flow"..... thanks to Sarah Palin, 3 July 2009.

185 = "Never forget that only dead fish swim with the stream"..... Malcom Muggeridge quoting a supporter in 1964.

186 = "As flat as a flounder" ..... proverb.

187 = "Mute as a mackerel"..... proverb.

188 = "Bring haddock back to the paddock"..... proverb meaning to spend or lose everything; to become destitute.

189 = "Neither (no) barrel better herring"..... proverb meaning never one better than the other, nothing to chose between them.

190 = "Never a barrel the (a) better herring"..... proverb meaning never one better than the other, nothing to chose between them.

191 = "Dead as a herring"..... proverb.

192 = "I like not barrel or herring"..... proverb meaning I dislike the whole of it.

193 = "Thick as herrings"..... proverb, as in shoals.

194 = "Like herrings in a barrel"..... proverb.

195 = "As thin as a herring"..... proverb.

196 = "Packed in like sardines"..... proverb meaning crowded like sardines in a can.

197 = "I don't think it helps people to start throwing white elephants and red herrings at each other"..... mangled idioms from Taoiseach of Ireland Bertie Ahern.

198 = "Fear death for when you are dead, you cannot then eat eels".....Philetaerus, 4th century B.C.

199 = "If wishes were fishes we'd all cast nets"..... it is useless to wish for something that work could achieve. Said in mockery or as an admonishment. A variant of "If wishes were horses, beggars would ride" from an English nursery rhyme and proverb.

200= "If wishes were fishes, beggars would fly"..... a less common variant of the above.

201 = "A trout in the pot is better than a salmon in the sea"..... Irish proverb.

202 = "fish rots from the head down"..... corruption starts at the top of an organisation; see also #49 above; a proverb from the 1674 "An Account of the Voyage to New England".

203 = "fish stinks from the head down" = fish rots from the head down.

204 = "fish tremble at the sound of my name"..... aphorism (a car bumper sticker and t-shirt slogan, presumably applied by overconfident fishermen).

205 = "a bad day of fishing is still better than a good day at the office"..... aphorism.

206 = "a fisherman is a jerk on one end of the line waiting for a jerk on the other"..... aphorism.

207 = "women love me, fish fear me"..... aphorism (a car bumper sticker and t-shirt slogan, presumably applied by overconfident fishermen).

208 = "so many fish, so little time"..... aphorism.

209 = "I fish, therefore I lie"..... aphorism.

210 = "fishing is always better on the other side of the lake"..... aphorism.

211 = "live to fish, fish to love"..... aphorism.

212 = "a day without fishing is like a day without sunshine"..... aphorism.

213 = "men and fish are alike, they both get into trouble when they open their mouths"..... aphorism.

214 = "give a man a fish, feed him for a day; teach a man to fish, you get rid of him for the weekend"..... aphorism.

## R

r = availability (the part of a fish population which lives in areas where it is susceptible to fishing during a given fishing season. This part receives recruits from or becomes mingled with the non-available part of the stock at other seasons, or in other years (Ricker, 1975). Fish become available through migration, movement in the water column, or growth).

$r = r$ .

r-selection = a life history strategy characterised by early maturity, rapid growth, large numbers of young produced at an early age, small body size, high mortality and short life span. This strategy is an adaptation to an unpredictable environment such as that found in the Arctic.

raag = rag.

race = 1) a geographical group of populations or a population differing from others. Formerly used as a synonym of subspecies. Now used to refer to units below the subspecies level which are not given taxonomic names. An infrasubspecific category which has no status under the International Code of Zoological Nomenclature.

race = 2) a very rapid current through a narrow channel.

race = 3) the course or track of a boat engaged in ripper-fishing (q.v.)(Scottish dialect).

race-to-fish = a pattern of fishing characterized by an increasing number of highly efficient vessels fishing at an increasing pace, with season length becoming shorter and shorter; a management system where individual boats race to take as much of the total allowable catch before the fishery closes. Also called olympic fishing and derby style fishing.

raceway = concrete, elongate and rectangular fish-rearing unit generally associated with a hatchery which has a large volume of flowing water, able to sustain greater fish densities than ponds, and able to maintain a cleaner environment. Used particularly for trouts, and less often catfishes. May be 100 m long, 1-10 m wide and 0.5-1.5 m deep and made of concrete (usually), brick, tile, earth or lined with plastic.

rack = 1) wooden structures on which cod were hung to dry in winter.

rack = 2) any structure for suspending fish fillets for drying and curing. Also called dry rack.

rack = 3) a weir.

rack = 4) the unit on which tuna fishermen stand, a removable outboard platform (fishing rack).

rack = 5) the remains after pressing herring for oil; used as a fertiliser. Also called pumie

rack = 6) a wooden structure placed in a river to block migrating salmon, directing them into a pound (Newfoundland).

rack = 7) a ford or a ridge of gravel in a river or tidal area.

rack rider = a young salmon or parr, from rack (4).

rackling = long, narrow (2.5 cm) strands cut from halibut sides with a fat content of about 2%. The strands are left joined at the "collarbone", brined and air-dried. Other fish with a 2% fat content may be used.

rade =raith.

radial = 1) a bony or cartilaginous support for a fin ray or spine. Usually three - the proximal, middle and distal radials. If the proximal radial is notably larger it is spoken of as a basal. Teleosts have only one row of radials between the fin rays and the supporting skeleton and these are called actinosts. More primitive fishes have more, e.g. *Polyodon* has 13, *Acipenser* has 9.

radial = 2) direction away from the axis running antero-posteriorly through the middle of the organism or structure; peripheral.

radial formula = counts of fin rays (see ray below and individual fins for counting methods).

radial intercalation = ordered cellular repacking among deep cells of the deep and shallow regions of the blastodisc, beginning during the late blastula period and perhaps continuing during gastrulation. This effects epiboly and produces a uniformly thin blastoderm.

radiation = rapid cladogenesis. Called adaptive radiation when a new feature enables a lineage to occupy a new niche or habitat.

radices caudæ = plural of radix caudæ.

radii = plural of radius.

radiograph = an x-ray plate, used to see internal characters such as vertebral counts.

radius (plural radii) = 1) ray.

radius (plural radii) = 2) grooves radiating from the centre of a scale towards the margin. Sometimes transverse in Clupeidae. Primary radii extend from the focus to the margin, secondary radii being outside of the focus. Also called sulci.

radix caudæ (plural radices caudæ) = caudal peduncle (the wrist-like portion of the posterior part of the body between the end of the anal fin and the base of the caudal fin. Its length is measured between the insertion of the anal fin and the caudal flexure (the fold shown by the hind edge of the hypural plates when the caudal fin is flexed). Depth is measured vertically at the narrowest point. Called tail wrist in angling).

raed =raith.

raft = a floating cage, box or platform.

raft fishing = 1) rafts floating on the water surface where fish become stranded. The fish may try to jump over them on moon-lit nights or fish may be scared towards the raft by noise from boats. A series of connected rafts may be used to encircle a school of fish which is then driven towards the rafts. Some rafts have nets hanging down from their edge to discourage fish from swimming under them.

raft fishing = 2) rafts constructed in open water to attract schools of such fishes as tuna so as to make them easier to catch by their concentration.

raft trap = a raft is overlain with twigs and such fish as mullet, jumping on the raft on their own volition, become trapped among the twigs.

rag = 1) to catch a fish by striking with the hook (Scottish dialect).

rag = 2) a lean or scraggy animal or fish (Scottish dialect).

raggedy = said of cod in Newfoundland that were imperfectly dried and had a rough, slightly cracked surface.

raggie = diseased fish infected with fungus (Scottish dialect).

raick = raik.

raid = raith.

raik = a stretch of river used for salmon fishing (Scottish dialect). Also spelled raike, rake, raick, rek, reck, reack and ryke.

raik dyke = a stone dam built across a dyke (Scottish dialect).

raike = raik.

rail = fishing with a hand-line over the rail of a boat.

rain shadow = a dry region on the lee side of a mountain range where rainfall is less and fish faunas may be depauperate.

rains of fishes = fishes falling from the sky like rain or in rain, the result of waterspouts and whirlwinds (see account by Gudger (1921)).

raip = rape.

raise net = a type of fixed net which rises and falls with the tide.

raise the herring = to induce herring shoals to rise to the level of the nets by magical ceremonies.

raised-pillar reel = a fishing reel with extensions on its side-plates, to which the frame pillars are attached, allowing more line to be wound on the spool.

raising = 1) estimating the total from a sample, by multiplying all the fractions in the sample by a raising factor equal to the proportion of the total which the sample represents, e.g. for a fishery by raising catch-at-size samples to the magnitude of the total catches, i.e. by multiplying the sampled numbers times the ratio of sample weight to total catch weight (or the ratio of sample numbers to total numbers).

raising = 2) growing fish by some artificial means of encouragement or assistance.

raith = a deep-sea fishing ground allocated to a particular fisherman or boat (Scottish dialect). See also raid, rade, raed and red.

rake = 1) a set of hooks attached to a structure such as an iron bar up to 8 metres wide towed behind a boat and impaling any fish encountered.

rake = 2) an implement like a large garden rake used to stir up the bottom of a lake or river. This attracts fish; used in the nineteenth century in England and effective for gudgeon (*Gobio gobio*).

rake = 3) raik.

rake trawl = a beam trawl with a rake or toothed structure along its lower edge to disturb and facilitate capture of flatfishes.

rakfisk = a traditional eastern Norway meal of trout or charr, salted and fermented for 2-3 months and then eaten without cooking.

rakorret = freshwater trout, gutted, lightly salted and fermented (Norway).

ram ventilation = the extraction of oxygen during the passage of water over the gills owing to motion through the water rather than active, muscular pumping. Used by *Echeneis naucrates* when hitching a ride. Certain pelagic sharks and bony fishes are obligate ram ventilators and are unable to pump water over their gills at rest. If they cease swimming for any length of time, they would asphyxiate.

ram's horn = 1) a box with slatted sides and holes in the bottom, used for washing fish in Newfoundland. The box was lowered into the water supported by straps attached to a boat or the wharf and men would sit on the edge to scrub the fish with brushes.

ram's horn = 2) a winding-net supported by stakes, used to capture fish coming in on the tide (Newfoundland).

ramification = side branch, e.g. in barbels of Synodontidae.

ramifying = branching, dividing.

rampani net = a very long shore seine operated by 60-80 fishermen in India.

ramus = a branch; one side of the lower jaw.

ramus impar = an unpaired nerve-like structure found in Myxines formed from the two intestinal rami of the vagus nerve united dorsal to the intestine. It contains numerous ganglion cells and cholinergic and adrenergic neurons.

ranching = commercial raising of fishes. Usually juvenile fish are released to a natural habitat for growth to a harvestable size, but see tuna ranch.

ranching to the rod = raising and releasing salmon smolts which migrate to sea and return to be caught by anglers. Wild stock do not then have to compete with hatchery fish in the freshwater environment.

rancidity = fish having a rancid flavour or odour acquired during storage from oxidation or hydrolysis of fat.

range = the geographical area inhabited by a species or other group. The range may be continuous or discontinuous (with gaps).

range extension = the record of a species outside its usual range.

range of tide = the difference in height between consecutive high and low waters.

ranivore = a feeder on frogs.

ranivorous = feeding on frogs.

rank = 1) the position of a taxon in a hierarchy of classification.

rank = 2) a fishing ground (Scottish dialect).

rank-based system = in nomenclature, the rules and principles governing the naming of taxa and the application of taxon names that is based on a taxonomic ranks; the hierarchical system of nomenclature.

ranksman = a member of a boat crew that has decided to fish in company with another boat and divide catches equally (Scottish dialect).

rapacious = grasping, predatory.

rapala knot = a knot used in angling to tie a lure to the line. An open loop at the lure allows free action. Various websites have animated steps showing how to tie this knot.

rape = to fix a fishing net to the head rope (Scottish dialect). Also spelled raip.

Raphael = the archangel, usually depicted in Christian art by a pilgrim's staff, or carrying a fish, in allusion to his aiding Tobias (see Tobit) to capture the fish which performed the miraculous cure of his father's eyesight.

raphe = in anatomy, a seam-like line or ridge between two similar parts of a body organ.

rapidograph = a trade name, often used generically for a technical pen. Such pens, with India ink (q.v.), are used to write permanent labels for immersion in jars with fish specimens.

rapids = a stretch of water in a stream or river with small waterfalls and turbulent, rapid water over coarse substrate. The gradient is about 4-8%.

rare (or vulnerable) = any indigenous species of fauna or flora that is particularly at risk because of low or declining numbers, occurrence at the fringe of its range or in restricted areas, or for some other reason, but is not a threatened species; such vulnerable species require careful watching.

Rassenkreis = a species composed of several geographical subspecies, a polytypic species (German), e.g. in *Istiblennius periophthalmus* (Salariidae).

rastrate = rake-like.

rat = slang for a very small fish.

rat-l-trap = original name and type of lipless crankbait, *q.v.* Used as a general term for crankbaits.

rat-tailed maggot = often the mousie (*q.v.*) used in ice fishing, the rat-tailed maggot of the hoverfly, cultured as bait. The rat-tail is a telescopic siphon used as a snorkel for breathing while submerged.

ratchet effect = the constant increase in exploitation due to the fact that positive short-term economic benefits often cannot be counterbalanced by the uncertain predictions of possible deleterious effects.

rate of exploitation = the fraction, by number, of the fish in a population at a given time, which is caught and killed by man during the year immediately following (= FA/Z when fishing and mortality are concurrent). The term may also be applied to separate parts of the stock distinguished by size, sex, etc. Abbreviated as *u* or *u* (Ricker, 1975). Also called fishing coefficient.

rate of fishing = instantaneous rate of fishing mortality (the decrease in numbers of fish over time when fishing and natural mortality act concurrently ( $N_t = N_0 * e^{-Zt}$ , where  $N_0$  is the initial number and  $N_t$  is the number of the remaining fish at the end of time  $t$ .  $Z$  is the instantaneous total mortality rate, usually composed of  $M + F$ , where  $M$  is the natural mortality rate and  $F$  is the mortality rate caused by the fishery)). Abbreviated as *F*.

rate of growth = growth rate (1) the increase in weight of a fish per year (or season), divided by the initial weight; often measured in terms of  $K$  in the von Bertalanffy curve for the mean weight as a function of age ( $W = W_{\max} (1 - \exp(-K \text{age}))$ ). Fish grow continuously, although more slowly as they become older. In a managed fishery, fish are allowed to grow to an age which produces good yields, neither too young (still growing rapidly) nor too old (growing slowly)).

rate of natural increase = instantaneous rate of surplus production (equal to rate of growth plus rate of recruitment less rate of natural mortality - all in terms of weight and on an instantaneous basis. In a balanced or equilibrium fishery, this increment replaces what is removed by fishing, and rate of surplus production is numerically equal to rate of fishing (Ricker, 1975)).

rate of removal = a poorly defined term that can mean either rate of exploitation or rate of fishing depending on the context (Ricker, 1975).

rate of utilisation = similar to rate of exploitation, except that only the fish landed are considered. The distinction between catch and landings is important when considerable quantities of fish are discarded at sea (Ricker, 1975).

Rathke's pouch = an embryonic invagination of the stomodeal ectoderm (roof of the embryonic mouth) which migrates dorsally to come into contact with diencephalon. It differentiates into the anterior pituitary gland or adenohypophysis. It becomes a blind naso-hypophyseal canal in

some Agnatha or develops secondary opening to the outside with or without a connection to the mouth. Also called craniobuccal pouch.

ration = the amount of feed allowed in an aquaculture facility for a given fish over a day.

rational fishery = a fishery designed to catch the maximum amount of quality fish in the most efficient manner.

rattle = 1) glass or metal objects added to lures which make a noise and attract such fish as bass (*Micropterus* spp.).

rattle = 2) a shallow, rocky declivity in a stream, rapids or a waterfall (Newfoundland).

rattle = 3) a narrow passage, inlet or arm of the sea, swept by strong tides (Newfoundland).

rattler brook = rattle (2).

rattling = the noise made by a fast-flowing stream (Newfoundland).

raun = rawn.

ravine = a watercourse larger than a gully but smaller than a valley. Not as incised as an arroyo or gulch.

ravine pond = a pond constructed by damming a ravine, and having spillways.

raw saith = bait, such as chopped up limpets, thrown into the water to attract fish (Scottish dialect).

rawn = the roe of fish (Scottish dialect). See also raun, rowan and rouny.

rawner = a mature but not spawning salmon.

ray = 1) a ray (excluding spines) is a flexible, rod-like segmented and often branched, bilaterally paired fin support of dermal origin. Rays may be divided into soft-rays (as just described) and hard-rays or pseudorays which are ossified, inflexible and superficially like a spine (pseudorays are found in some Cyprinidae, all Ictaluridae, Notacanthidae, etc.). Called dermochirous as their origin is dermal. Ray counts are given in Arabic numerals, e.g. 11-14. Simple (rudimentary) fin rays are small, unbranched, unsegmented soft rays usually found at the beginning of a fin. The term ray is sometimes used generically to include spines, which are unpaired and unsegmented, usually sharp and stiff rods supporting the membranes of the fins. Spine counts are given in Roman numerals, e.g. X-XII.

ray = 2) a common name for some members of the skate family Rajidae in the Order Rajiformes, from the Latin *raia* for this type of fish.

ray length = the distance from the extreme tip to the base of that ray.

ray net = a large mesh tangle net for catching rays and shallow water anglerfishes.

rayless dorsal fin = adipose fin (a small fleshy fin lacking rays or spines but reinforced by actinotrichs posterior to the soft dorsal fins (rarely a hard ray or a few soft rays may be developed in the adipose fin of certain catfishes), e.g. in Salmonidae, Osmeridae, Argentinidae, Myctophidae, Ictaluridae, Percopsidae).

raw data = un-analysed information.

re- (prefix) = again, repeat.

re-introduction = the stocking of a species into waters where it had become extirpated.

re-spool = replacing old line on a reel with new line.

reach = 1) a section of a stream or river between two defined points, a continuous extent of water. More specifically a length of channel uniform with respect to discharge, depth, area and slope.

reach = 2) an area of a river, e.g. the upper reaches are where the river begins, the lower reaches the final stages.

reach = 3) an arm of the ocean extending into the land.

reach = 4) a straight section of restricted waterway of considerable extent, much longer than a narrows.

reach cast = a cast when fly fishing used for adding extra slack to the line, or when fishing downstream, to ensure a natural presentation.

reack = raik.

read = to interpret scale or other rings in terms of age and growth.

ready-to-eat fish = any fish, other than canned fish, that does not require preparation except thawing or reheating before consumption.

real catch = the weight of fish taken from a water body, gross catch.

Real Fish Don't Eat Pellets = a bumper sticker opposing fish farms.

reaper = in angling, a soft plastic lure resembling a leech.

rear = 1) to feed and care for in a natural or artificial environment.

rear = 2) to breed.

rear admiral = the master of the third English fishing vessel to reach a harbour in Newfoundland. This position gave the owner certain privileges for the season under the admiral and vice-admiral.

rearing = the amount of time that juvenile fish spend feeding in nursery areas of rivers, lakes, streams and estuaries before migration, or the care and support for young fish.

rearing habitat = areas where larval and juvenile fish find food and shelter.

rearing pond = 1) an artificial impoundment in which juvenile fish are raised prior to release into the natural habitat.

rearing pond = 2) all types of ponds in which fish are grown.

rearing station = an establishment for hatching and rearing stocked fishes.

reast = reest.

reballing = clatting (fishing for eels with a cluster or clot of worms, each of which has had a strong worsted drawn through the length of its body (English dialect). See also quod and clotting).

rebuilding = action allowing a stock or population to grow back to a pre-defined target level.

rebuilding analysis =use of biological data to describe the probability that a stock will rebuild within a given time under a management plan.

recall bias = faulty memory as it affects reporting of catches in angler surveys.

Receiver of Wreck = a British government official concerned with shipwrecks and their legitimate ownership. Also tasked with disposing of Royal fish, *q.v.* Also called coroner of the seas.

receiving waters = water bodies that receive treated or untreated waste waters.

Recent = a geological epoch within the Quaternary Period ca. 10,000 years BP to the present day. Also called Holocene.

recent = 1) extant, still in existence.

recent = 2) abbreviation for *recentiorum*.

recent colonist = a species that has extended its range recently by natural means and is reproducing.

*recentiorum* = of recent authors.

recessus lateralis = intercranial space into which open the major cephalic lateral line canals. It is separated by a membranous fenestra from the spaces of the ear in Clupeidae.

reck = raik.

Recommendation = an advisory statement in an Article of the International Code of Zoological Nomenclature; these are not mandatory.

reconditioned fish = mended fish (post-spawning fish that have or are recovering).

recovered fish flesh = recovered flesh.

recovered flesh = the flesh of a fish separated from skin and bones by mechanical means (see bone separator). Also called minced fish, mechanically recovered fish flesh, recovered fish flesh, boneless fish meat and deboned fish flesh.

recovery rope = lazy deckie (a rope to haul the cod end to a ship's side).

recreational fisher = one participating in a recreational fishery.

recreational fishery = fishing for personal use, entertainment, sport and challenge; does not include sale of catch but does include the businesses associated with it. Also called recreational harvest.

recreational harvest = recreational fishery.

recruit = an individual fish that has moved into a certain class, such as the spawning class or fishing-size class through growth, migration, etc.

recruit stock = the stock that each year is added to the portion of the fishable population.

recruit-to-spawner ratio = an estimate of the number of recruits (fish that are available for harvest in addition to those that escape the fishery to spawn) produced by the previous generation of spawners. The spawner-to-spawner ratio estimates the number of spawners (those fish that reproduced or were expected to reproduce) in one generation produced by the previous generation of spawners. A spawner-to-spawner ratio of 1.0 indicates that, on average, each spawner produced one offspring that survived to spawn; the size of such a population would remain unchanged over that generation.

recruitment = 1) the new members by immigration and/or numbers of fishes born in a given year, or entering a certain class, such as the spawning class or a fishing-size class. Recruitment to a fishery varies greatly from year to year, depending on all sorts of environmental variables, with a few large year classes among many small year classes.

recruitment = 2) recolonisation of a place by a species or fauna.

recruitment curve = a graph of the progeny of a spawning at the time they reach a specified age, e.g. the age at which half of the brood has become vulnerable to fishing, plotted against the abundance of the stock that produced them (Ricker, 1975). Also called reproduction curve.

recruitment level = the ultimate number of a specific year class that survives to attain sexual maturity and joins the reproductive population.

recruitment overfishing = the rate of fishing above which the recruitment to the exploitable stock becomes significantly reduced. This is characterized by a greatly reduced spawning stock, a decreasing proportion of older fish in the catch, and generally very low recruitment year after year. May lead to stock collapse if prolonged and combined with poor environmental conditions. This may take 20 years or more to recover. Species like sharks which produce few young are very vulnerable to recruitment overfishing. In species like cod, the number of spawners has little effect on recruitment as long as there is a minimum spawning stock biomass (cod release far more eggs than ever survive so a few fish can support good recruitment).

recruits = the new age group of the population entering of the exploited component of the stock for the first time or young fish growing or otherwise entering that exploitable component.

rectal gland = an evagination of the terminal portion of the intestine of Elasmobranchii. Function formerly thought to be related to digestion or excretion, but now considered to secrete high concentrations of excess sodium chloride. Found also in the coelacanth *Latimeria chalumnae*.

rectal valve = a thin diaphragm located in the posterior fifth of the intestine of some Centrolophidae, e.g. *Seriolella punctata*, *Schedophilus huttoni* and *Psenes pellucidus*, or in others a sphincter-like constriction, e.g. *Seriolella brama*. A deep purple fluid was confined to the valve in *S. punctata*, but was found throughout the intestine in the other two species referred to. The fluid might be used to void a coloured cloud to distract or deter a predator.

rectangular drainage system = a system of streams arranged around faults in the ground. See also annular, dendritic, deranged, parallel and trellis drainage systems.

rectilinear = straight-lined.

recto = any odd-numbered page of a book, on the right. Opposite of verso.

rectum = the terminal portion of the intestine.

rectus abdominus = muscle along the mid-ventral line of the abdomen with longitudinal fibres.

rectus muscles = the muscles that move the eye up, down, backward and medially. They are the inferior, medial, lateral, and superior recti.

recurved = curved upward, backward or inward.

red = raith.

red body = gas gland (a structure with numerous blood vessels (retia mirabilia) in the gas bladder that secretes gases from the blood. Also called fascis mirabilis).

red caviar = caviar made from salmon eggs.

red cod = a fungal condition found in preserved cod, *Gadus morhua*.

Red Data Book = list of threatened and extinct species for a given country.

red feed count = a condition found in capelin that feed on plankton in or near the harvesting season, leaving them with a reddish coloration, unsuitable for marketing in Japan (Newfoundland).

red fish = male salmon, from their red colouration (Scottish dialect).

red fisher = a fisherman for salmon on the Scottish Tweed River.

red gland = gas gland (a structure with numerous blood vessels (*retia mirabilia*) in the gas bladder that secretes gases from the blood. Also called fascis mirabilis).

red herring = 1) a strongly salted and cold smoked unsplit whole herring, having a red colour. Smoking lasts 2-3 weeks until the fish is hard. Also called hard smoked herring.

red herring = 2) a diversion intended to distract attention from the real issue (herrings are reddish when smoked and odiferous, and have been used to lay false trails in fox hunting and by escaping criminals trying to confuse pursuing bloodhounds).

red muscle = dark meat (muscle from just under the skin on each side of a fish that is darker and richer in fat than other flesh. Also called blood meat, brown muscle, dark muscle, red muscle).

red pest = Hitra disease (a disease of farmed Atlantic salmon among others caused by certain *Vibrio* species active at temperatures below 10°C and producing muscular and myocardial degeneration. Red or bloody streaks appear on the body and fins and can lead to fin and tail rot with, in severe cases the tail and/or fins falling off. Also called coldwater *Vibrio*). See also bacterial haemorrhagic septicaemia and pike pest.

red sore disease = a disease caused by a ciliated protozoan (*Heteropolaria* sp.) exhibiting as ulcers or cotton-like growths on the skin, scales and fin spines causing a red lesion, and also found on eggs. Also called "epistylis" after another genus of protozoans.

red tide = a population explosion in marine plankton such as dinoflagellates that is toxic and fatal to fish. The colour of the tide can be red, pink, yellow, green, blue, purple, black or brown. See also brevetoxin.

red worm = a type of worm used as bait in angling.

redd = the nest made by a salmonid comprising a hollow in the stream gravel, where eggs are laid and fertilized, and covered with gravel. The buried eggs are oxygenated by the current, e.g. in Petromyzontidae and Salmonidae.

redd count = the count of number of redds in a river as identified by shape, size and colour, used to compare the relative magnitude of spawning activity between years.

redefinition = emended diagnosis (change in the scope of application of a name, involving a change in the diagnosis (*q.v.*) of the taxon. Not the same as emendation (*q.v.*)).

redeposition = in taxonomy, the transfer of a taxon to a new position with or without a change in the name.

redescription = a more or less complete statement of the observed characters of a taxon, without any special emphasis on those which distinguish it from other closely related taxa, including new or altered information to that usually given in the description.

redfish oil = "ocean perch" (*Sebastes* spp.) oil used to tan leather, as a base for paint, for softening horses' feet, as a rust inhibitor, and for tools on oil rigs. Also reputedly poured on rough seas to calm them!

redhorse = a member of the genus *Moxostoma* in the family Catostomidae, large freshwater fishes of North America with about 10 species, large in size and with reddish fins.

redmouth disease = a bacterial infection with *Aeromonas hydrophila*. See bacterial haemorrhagic septicaemia and pike pest.

redox potential = reduction-oxidation potential of water, giving an indication of how well an aquarium would support life. It refers to an electrical charge on a molecule that has transformed in a chemical reaction. The redox potential can be altered by the use of ozone and redox additives.

reduced = a less-developed condition of character.

reduction = 1) a decline in the number of mature individuals of at least the amount stated over the time period specified, although the decline need not still be continuing. Not necessarily part of a natural fluctuation.

reduction = 2) the conversion of fish flesh into products by grinding, rendering, extracting and other processes, e.g. such products as animal, feed, fertiliser, oil.

reduction in status = see status.

reduction fishery = reduction industry.

reduction industry = the process and manufacture of products from fish flesh such as meal and oil, e.g. oil extracted from menhaden used in production of linoleum, health products, etc.

reef = 1) a deposit of skeletal carbonate material forming a complex and varied habitat for fishes and other marine life.

reef = 2) a ridge of rocks or sand lying near the surface.

reef aquarium = a fish tank with live corals and associated invertebrates, meant to showcase these organisms rather than any fish that may be included.

reef base = the area below the consolidated slope extending up to 1 km but no deeper than 50 m. Also called talus slope.

reef block = a large, isolated rock section that has been displaced (usually by storm waves) from the reef or the bedrock.

reef breakwater = a rubble mound of stones of uniform size with a crest at or below sea level which is re-shaped by waves.

reef complex = the entire reef structure, including reef surface, lagoon deposits and off-reef deposits.

reef crest = the sharp break in slope at the seaward margin or edge of a reef flat.

reef drag seine = similar to a beach seine with the float line submerged, fished on reefs and continually unsnagged by divers. Also called reef seine.

reef face = reef front.

reef fish = fish that live on or around reefs, e.g. groupers, grunts, porgies, snappers, etc.

reef flat = the area between a fringing reef and the shoreline. Covered by water at high tide but has little or no water at low tide.

reef front = the outside or seaward edge of a coral reef where diversity of habitat for fishes is greatest. Also called reef slope.

reef mound = a structure that lacks reef characteristics, such as diversification and domination stages.

reef net = a square set net used between reefs, anchored, with fish guided into the net by leads of rope, operated by two canoes, and the weighted lead line raised quickly to the surface to entrap the fish.

reef rubble = an accumulation of dead coral pieces, often colonized with macroalgae. Often found landward of well-developed reef formations.

reef safe = fishes deemed safe to introduce to a marine aquarium, these being species that do not consume other fishes or invertebrates, or aggressively compete for territory.

reef seine = reef drag seine.

reef slope = the reef seaward of a reef crest.

reef system = a cluster of reefs.

reef tank = reef aquarium.

reef top = the area comprising the reef flat and reef crest.

reeklin = the flesh of halibut cut into strips and dried in peat smoke (Scottish dialect).

reel = winder consisting of a revolving spool with a handle, attached to a fishing rod; cylindrical device attached to a fishing rod to let out or wind up the line.

reel line = the line wound on an angler's reel.

reel seat = the area behind the grip on a fly rod where the reel is attached.

reen = a deep drainage channel. A dialect word of Wales. Spelled rhyne in southwest England.

reenge = to agitate water to drive fish out of hiding places (Scottish dialect). Also spelled reinge, ringe and rynge.

reesh = reest.

reest = to smoke or cure fish (and meat) (archaic). Also spelled reist, riest, reast, rest, rist and reesh.

reeve = attach or interweave a fish onto a sharp stick (Newfoundland).

reeving string = a draw string around a net, e.g. a castnet.

reference = a bibliographic source usually comprising author, date, year, title of article or book, name of journal, place of publication, volume, issue and pagination, or name of publisher, place of publication and pagination.

reference level = a particular level of an indicator, e.g. of fishing effort, fishing mortality or stock size, used as a benchmark for assessment and management performance.

reference plane = the plane to which sounding and tidal data are referred.

reference point = 1) a particular state of a fishery indicator corresponding to a situation considered as desirable, e.g. target reference point, TRP, or undesirable and requiring immediate action, e.g. limit reference point, LRP and threshold reference point, ThRP.

reference point = 2) a specified location to which measurements are referred.

reference station = 1) a tide or current station for which tidal or current constants have previously been determined and which is used as a standard for the comparison of simultaneous observations at a second station.

reference station = 2) a station for which independent daily predictions are given in the tide or current tables from which corresponding predictions are obtained for other stations by means of differences or factors.

referral = transfer of a subordinate taxon from one taxon to another, e.g. species removed from one genus and referred to another, genus removed from one family and referred to another.

reflex strike = a bite by a fish that was not feeding but reacted to the movement or noise of a passing lure.

reflexed = bent or turned backwards.

refreezing = freezing fish after it has been thawed or partially thawed, as in tempering, *q.v.*

refreshed = 1) refrozen.

refreshed = 2) frozen then thawed.

refrozen = fish frozen at sea then thawed for processing onshore and then re-frozen. Also called twice-frozen or double-frozen.

refuge = 1) a part of the range of a stock which is not accessible to fishing and therefore enables a species or stock to survive higher fishing levels outside the refuge.

refuge = 2) in aquaria a compartment within the main tank or a separate container using water taken from the main tank. Protects fish from predation.

refugia = plural of refugium.

refugium (plural refugia) = 1) an isolated locality often surrounded by a different climate or habitat; often a centre for relics; a refuge in which organisms survived during glaciation, having escaped major climatic change.

refugium (plural refugia) = 2) water where threatened fishes are stocked for safe-keeping.

refusal = the International Commission on Zoological Nomenclature may refuse to use its Plenary Powers in any given case proposed to it. In such a case the Opinion (*q.v.*) rendered is to specify the name(s) to be used in the case in question, and the action (if any) to be taken.

refuse cod = dried and salted cod below the grade suitable for sale (merchantable cod).

regenerated scale = a replacement scale.

regime shift = a medium- or long-term shift in environmental conditions that impacts the productivity of a fish stock.

regio occipitalis = occipital region (the posteriormost part of the neurocranium, comprising the exoccipitals, basioccipital, occipital, dermosupraoccipital and supraoccipital bones, enclosing a large part of the brain and the membranous labyrinth and connecting to the vertebral column).

regio orbitalis = orbital region (the head around the eye comprising such dermal bones as the antorbital and infraorbitals (bearing a sensory canal) and the suborbitals and supraorbitals (without a canal)).

regio otica = otic region (the skull area containing hearing and equilibrium organs and including endochondral bones (autosphenotics, autopterotics, opisthotics, epiotics), dermal bones (intercalaries, pterotics) and mixed origin bones (sphenotics, prootics)).

registrar = the person in a museum charged with the responsibility for the development and enforcement of policies and procedures related to the acquisition, management and disposition of collections. The registrar maintains records and arranges accessions and loans.

registration = 1) the process of maintaining a means of identifying a specimen(s) for which a museum has permanent responsibility; the overall functions of the registrar.

registration = 2) inclusion of names and nomenclatural acts in the Official Register of Zoological Nomenclature; required for a new scientific name to be published in an electronic work.

registration number = a unique identifying number for registration (1) or (2).

regression = gradual contraction of a shallow sea so land emerges and rivers are extended either from a sea level fall or land level rise.

regulation = 1) a legal statement affecting fishing.

regulation = 2) controlling the flow of a river.

regulative capacity = a population's tendency to revert towards some typical average level of abundance rather than to increase or decline indefinitely or to drift aimlessly. Also called homeostasis.

regulated fishery = any fishery with a management plan in place to maintain maximum sustainable yield.

regulative capacity = the tendency for a population to revert to a typical average number of individuals rather than to decline or increase.

regulatory amendment = an option for a fishery manager to make regulatory changes to a fishery management plan. Requires some public input but is not a full amendment.

regulatory discard = a fish thrown overboard because of the regulations as to size or species allowed to the fishery.

rehabilitation = restoration of fish stocks lost by natural or man-made events.

reinge = reenge.

reiniform = kidney-shaped.

reinstate = with reference to a name previously rejected as being a junior secondary homonym: to treat it as a valid name if the conditions of the International Code of Zoological Nomenclature are met.

reintroduction = establishing a species in waters where it has been lost, primarily for conserving the species, not to support a fishery.

reist = reest.

reister = a smoked salmon or other fish (Scottish dialect).

reject = in taxonomy, to set aside the name of a taxon in favour of another name, or to set aside a work that must not be used for nomenclatural purposes.

rejecta = egesta and excreta, both *q.v.*

rejected name = a name which, under the provisions of the International Code of Zoological Nomenclature, cannot be used as a valid name and which is set aside in favour of another name; a name which, as a matter of taxonomic judgment, is either treated as a junior subjective synonym of a name used as valid or is believed not to be applicable to the taxon under consideration. Abbreviated as *nom. rejic.* and *nom. rej.*

rejected work = any work (in the sense of a publication) included by the International Commission on Zoological Nomenclature in the Official Index of Rejected and Invalid Works in Zoological Nomenclature.

rejuvenated river = a river with a gradient that is raised by the earth's movement. See also youthful, mature and old rivers.

rek = raik.

relatedness = sharing of a more recent common ancestor by two clades than they do with any other clade.

relative abundance = an index of fish population abundance used to compare fish populations from year to year. This does not measure the actual numbers of fish, but shows changes in the population over time.

relative conversion rate = quantity of food distributed divided by total production of fish in aquaculture. Dependent on food distributed but also on stocking density, health of fish, age class, competition, feeding methods, environmental conditions, etc.

relative fecundity = the number of eggs per unit weight of fish.

relative fishing power = the relative vulnerability of the stock to different boats or gears. Usually determined as the catch taken by the given apparatus, divided by the catch of a standard apparatus fishing at nearly the same time and place.

relative weight = a body condition index; from the measured weight of an individual fish (times 100) divided by a standard weight for the species at that length. Standard weight is the 75th percentile of the weights of a given species within specified length increments. Abbreviated as  $W_r$ .

release = 1) returning a fish to the water after capture, usually in a sport fishery, with as little damage as possible.

release = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for anglers (coined as a joke).

releaser = the stimulus that starts an innate behaviour pattern, e.g. courting behaviour in a male stickleback is instigated by the releaser of a silver colored female (or model) with a swollen abdomen. Also called sign stimulus.

releasing stimulus = a stimulus which causes the female to shed her eggs.

reliability = the extent to which a resource, if managed properly, can be depended on to provide a reasonably constant yield. An unreliable resource is one that may fail but not through fishing.

relic = relict.

relict = 1) survivors of a formerly widespread fauna existing in certain isolated areas or habitats.

relict = 2) a phylogenetic relict, a form in an otherwise extinct taxon, e.g. *Latimeria chalumnae*.

remora = 1) a member of the family Echeneidae, in legend able to impede or even stop ships.

remora = 2) a hindrance or drag.

remora fishing = a captured remora is released from a boat with a line attached through its tail or to a ring through the tail. The remora then attaches to a turtle or shark which can be pulled to the boat and speared. The technique is known from the Caribbean to east Africa and China and Australia. This temporary attachment of one animal to a faster one is called phoresy. Also called sucker fishing.

remorsotype = a joke name in nomenclature for the type of a taxon that the author regrets having described.

remote site incubator = a lightweight, dark-colored, plastic barrel using a plastic substrate as a hatching medium. Used to incubate up to 125,000 salmon eggs.

remotely operated vehicle = a vehicle that dives in deep water to film deepsea organisms such as fishes. It is controlled from onboard ship and carries no passengers. May be equipped to capture fish or lay traps. Abbreviated as ROV.

rémoulade = a condiment served with meats (including hotdogs) and seafood dishes, often made with mayonnaise, flavoured with curry and sometimes containing chopped pickles or picalilli along with horseradish, paprika and capers, etc. Can contain anchovies.

removals = all of the fish removed from a stock by fishing, including the catch and any fish killed but not caught.

renal = pertaining to the kidney.

renal corpuscle = the kidney unit consisting of a glomerulus in a Bowman's capsule.

renal vein = paired veins draining the kidneys into the posterior cardinal veins, q.v.

renal-portal system = a circulatory system found in fishes and other vertebrates (except mammals) where blood leaving the tail passes through a venous capillary system associated with the kidneys before entering the heart.

reniform = kidney-shaped.

rensei-hin = inclusive term meaning the products made from kneaded fish meat, e.g. kamaboko (*q.v.*). Also called nerisei-hin.

rent = the difference between the total revenues obtained from the fishery resource and the total costs of production.

repack = 1) removal of cured fish from the original curing salt, and washing and packing in barrels into which salt and/or saturated brine are added.

repack = 2) herring which did not pass inspection until repacked.

repatriation = the return to a place normally inhabited.

repile = the rearrangement of salted fish piles by putting top layers on the bottom and bottom layers on the top.

replacement bone = endochondral bone.

replacement name = replacement name (a new name (*nomen novum*) published or an available synonym adopted to replace an earlier name, and valid only if the latter is preoccupied; commonly applied to substitute names proposed to replace junior homonyms). See also *nomen substitutum*.

replacement scale = a scale which has formed in the place of a lost scale. The centre portion of a replacement scale is equal in size to the one lost but lacks ridges and radii. Not useable for aging purposes. Also called macrocentric, regenerated or latinucleate scale.

replacement yield = the amount of yield in weight that can be removed from a population of fish without leading to biomass increase or decline. Replacement yield is high when population productivity is high under proper exploitation and it is low when the population is underexploited or overexploited. If yield taken is equal to the replacement yield, then the biomass will not change from year to year.

replacemotype = an unofficial term in nomenclature for a good specimen used to replace a primary type that has been destroyed or is in poor condition.

reported species = an introduced organism collected without evidence of reproduction.

representative = said of a specimen that is characteristic of a species without being a type.

reprint = a printed copy of an article in a serial publication or in a separate work, intended for distribution subsequent to the publication of the work that contains it; the text is identical with

the original, but there may be changes in headings, pagination, or page arrangement. Also called separate or separation. See preprint.

reproduction curve = a graph of the progeny of a spawning at the time they reach a specified age, e.g. the age at which half of the brood has become vulnerable to fishing, plotted against the abundance of the stock that produced them (Ricker, 1975). Also called recruitment curve.

reproductive drain = the theory that growth and reproduction in fishes are antagonistic. Females would grow less than males because of their greater investment in egg production compared to that required for sperm production in males. Generally not true as many fish females are larger than males.

reproductive guild = a group of unrelated fishes with a similar form of reproduction, e.g. on substrates such as rocks and gravel (lithophil), in open water (pelagophil), on plants both living and dead (phytophil), on sand (psammophil), in holes and crevices (speleophil) and various (polyphil); or by behaviour such as external bearers (mouth brooding), internal bearers, guarding or non-guarding, hiders, nest builders, scatterers, etc. See reproductive style.

reproductive isolation = the inability of two or more groups of organisms to interbreed, either because of inherent or external reasons (e.g. different behavior, a geographic barrier). Inherited reproductive isolation is the basic criterion of species.

reproductive potential = potential number of a species that will attain maturity from the spawning of each adult.

reproductive products = roe and milt.

reproductive style = the methods of reproduction seen in fishes have been summarised in Balon (1990). Three ethological sections are nonguarders, guarders and bearers. Nonguarders produce eggs which are scattered into the water (reproductive guilds pelagophils, lithopelagophils, lithophils, phytolithophils, phytophils, psammophils and aerophils, all *q.v.*) or egg broods which are hidden (reproductive guilds aeropsammophils, speleophils, lithophils, ostracophils and xerophils, all *q.v.*). Guarders include clutch tenders (reproductive guilds pelagophils, aerophils, lithophils and phytophils, all *q.v.*) and nesters (reproductive guilds aphrophils, polyphils, lithophils, ariadnophils, phytophils, psammophils, speleophils and actiniariophils, all *q.v.*). Bearers include external brooders (reproductive guilds transfer brooders, auxiliary brooders, mouth brooders with and without buccal feeding, gill chamber brooders and pouch brooders, all *q.v.*) and internal live bearers (reproductive guilds facultative and obligate lecithrophic, embryonic cannibal, histotrophic, placentotrophic and combined live bearers, all *q.v.*).

republished name = a name introduced as a replacement for a name that is not available (preoccupied).

research collection = a collection of museum specimens meant to be worked on by a researcher; there may be restricted access until the material has been fully worked up and it may then be added to the museum's primary collection or the material may be valuable

scientifically but of poor quality or of uncertain ownership and not meant for eventual deposition in the primary collection.

reserve = a part of a quota set aside at the beginning of the fishing season to allow for uncertainties in estimating the catch.

reservoir = an area behind a dam where water is collected and stored for later use. May also include a natural water body used for control.

reservoir host = a fish that serves as a source of infection for other organisms by harbouring infections and parasites.

resident = refers to non-migratory fish, usually salmonids. May refer to fish that remain within a circumscribed area.

residuals = members of a generally anadromous species which do not migrate but remain in fresh water and do not spawn, e.g. in *Oncorhynchus nerka*; a juvenile that matures sexually before it smolts and goes to sea.

resilience = 1) capacity of a natural system such as a fisheries community or ecosystem to recover from heavy disturbance such as intensive fishing.

resilience = 2) a measure of how much disturbance can be absorbed before the ecosystem changes.

resorption = the loss of calcified material through a physiological process. Found in scales for example.

resource = a fishery resource is those natural components of value to a fishery, i.e. fish.

resource rent = the value to fishers of the fish in the water before they are caught. It is usually a large component of the economic rent.

resource user = any user of a fishery resource, e.g. a holder of a commercial licence, a quota holder, an aboriginal group with a communal licence, a processor who holds a fishing licence, a recreational fisher, an aquaculturist who uses wild fish stocks.

response error = errors in angler surveys caused by faulty memory, exaggeration, rounding bias, lying, misunderstood questions, misidentified species or incorrectly measured fish.

responsible fishery = the sustainable utilisation of fishery resources in harmony with the environment.

rest = reest.

rest line = a line of discontinuity within a tissue such as bone, corresponding to a temporary but complete cessation of growth.

resting egg = a fish egg that has entered a state of slowed or stopped development. May refer to eggs in diapause or those with slowed, but not the arrested, development typical of diapause.

resting stage = the period in larval development between hatching and active feeding.

restocking = adding fish as young or adults to a water body where they are few in numbers to support a fishery.

restoration = re-establishment of fish stocks lost from, or reduced in, an area through overfishing or pollution.

restricted (morphologically) = reduced, e.g. gill openings restricted (reduced in size).

resurrected name - in nomenclature, a name that has been re-introduced because formerly it was neglected or ignored (obscurely published for example), types could not be located to validate it, or it was thought incorrectly to be a synonym.

resurrectotype = an unofficial term in nomenclature for an original type specimen thought to be lost or destroyed but rediscovered. Often a neotype has been designated.

retain = in nomenclature the continued use of a name as the correct one, especially where a taxon has been divided.

retained catch = that part of the total or gross catch that is not discarded. See also total catch.

retaliator = said of fish that will only attack if accidentally disturbed or deliberately provoked.

retardation = the amount of time by which corresponding tidal phases grow later day by day (about 50 minutes).

retarding reservoir = a reservoir for temporary storage of flood water. Also called detention dam or reservoir.

retention = 1) the probability of a fish encountering a fishing gear and being retained by it after coming in contact with it. Often expressed as a function of size or age (retention curve).

retention = 2) pertaining to a character retained in an evolutionary sequence, either primitive or derived.

retention basin = a wetland or excavated basin constructed to contain excess rain or runoff, especially in urban developments where water cannot be easily absorbed into the ground. Some drain quickly and support no fish life, others have a permanent central area conducive to fish. See also detention basin.

retention curve = relationship between the size or age of a fish and its probability to be retained by the fishing gear after encountering it.

retention pond = retention basin.

retention time = the average length of time water resides in a lake. May be a few days in a small artificial impoundment to many years in large seepage lakes. Long retention times result in greater recycling and greater nutrient retention with consequent effects on the fish fauna.

retia mirabilia (singular rete mirabile) = the clump of parallel arterial and venous capillaries which supplies the gas gland with blood and is found on the outside of the gas bladder. Also a heat exchanger in Scombridae.

retiarii = plural of retarius.

retarius (plural retiarii) = a net man or Roman gladiator using a net or rete, hence the name, a trident and a dagger, equipment resembling that of a fisherman. He lacked armour, except for a shoulder guard protecting the face and neck and fought naked.

reticle = graticule (a network of fine lines, dots, cross hairs, or wires in the focal plane of the eyepiece of an optical instrument. Used to measure the size of such objects as eggs of fishes. Also called reticule).

reticulated = with a network, e.g. lamellae of gills of *Acanthocybium* (Scombridae).

reticulation = 1) network pattern, e.g. reticulations in a colour pattern.

reticulation = 2) joining of separate lineages on a phylogenetic tree through hybridisation or lateral gene transfer.

reticule = graticule (a network of fine lines, dots, cross hairs, or wires in the focal plane of the eyepiece of an optical instrument. Used to measure the size of such objects as eggs of fishes. Also called reticle).

retina = that part of the eye developing from the optic primordium; includes the neural retina and the retinal pigment layer and is continuous with the optic nerve.

retinal pigment layer = a single-cell layer of pigmented epithelium covering the neural retina and developing from the outer of the two layers of the optic cup.

retractor dorsalis = muscles associated with the pharyngeal jaws and used in swallowing food.

retrieve = 1) recovering line cast out while fishing.

retrieve = 2) various ways of working or fishing a lure.

retrieve = 3) a descriptive term for a type of fly reel, whether it has a left or right hand retrieve.

retro- (prefix) = backwards.

retroactive = active back in time; used in nomenclature for provisions of the Code of Zoological Nomenclature that are operational regardless of when they became part of the Code (unless specifically stated otherwise).

retroarticular = the triangular, endochondral, dermal or mixed origin bone on the back, hind corner of the lower jaw. Often called the angular, Bridge's ossicle *a*, lower articular or angulo-retroarticular.

retrograde = said of a structure that is located farther back than is typical of the group.

retronym = a modification of an existing word occasioned by a discovery or a new concept, e.g. herring became Atlantic herring once Pacific populations were determined to be a distinct species.

retroperitoneal space = the space behind the peritoneal cavity, housing the kidneys.

retrorse = bent or turned backward or downward.

retrospective pattern = this pattern indicates that model estimates for the most recent years change substantially and systematically as new years data is added. This indicates a potentially serious bias in stock assessment.

revalidated name = a name published before the starting date of a group but subsequently validly published.

reversal = change of normal symmetry, where dextral species occasionally produce sinistral individuals or vice versa. The reversal occurs in the eyes, head and epidermal features but does not affect the visceral organs.

reverse cast = casting across the body on the off-hand side of the stream in nymphing (the right side of the stream for a right-handed angler, and vice versa). Also called western roll cast.

reverse protein factory = a term for aquaculture where fish are fed other fish to produce a more desirable product, e.g. Atlantic salmon in Chile fed local fish species at about a 3:1 ratio.

reversed = a hook offset to the left when viewed from the top of the hook with the eye towards the observer, *cf.* kirbed. A hook that is not offset is called straight.

reversibility = the extent to which a change in a stock or ecosystem induced by exploitation will reverse itself when the causative factor is removed.

reversing falls = a name applied to falls which flow alternately in opposite directions in a narrow channel in the St. John River at St. John, New Brunswick; caused by a reversing tidal current.

reversing tidal current = a tidal current that flows in opposite directions with a slack water at each reversal of direction. Usually found in rivers and straits which have restricted channels.

revetment = structures built along river banks to prevent erosion, such as a stone facing or a retaining wall.

revision = a critical re-appraisal of a taxon systematically.

revisor, first = the person who first selects one of two or more simultaneously published names that (s)he believes represent the same taxon, or who selects which one of two or more taxa for which identical names have been simultaneously published, the name will apply to. This is done in the interest of nomenclatural stability.

revolving-spool reel = bait casting reel (a fishing reel in which the spool is not stationary during a cast but revolves).

rhabdoid = rod-shaped.

rheo- (prefix) = current, flowing.

rheocrene = a spring producing running water in the form of a stream.

rheokinesis = movement in relation to water currents.

rheophilous = having an affinity for, or thriving in, flowing water

rheophobous = intolerant or flowing water.

rheoplankton = the plankton of running water. Also called potamoplankton.

rheoreceptor = current receptor - lateral line organs.

rheotaxis = orientation to water currents. Positive rheotaxis means facing upstream, negative rheotaxis oriented downstream.

rheotropic = responsive to a current.

rhinal = related to the nose.

rhine = ditch, deep water or drainage channel, river bed, stream, small river. Also spelled rhyne.

rhino rig = a fishing rig with two boilies, q.v., on a pop-up on the normal hair and a normal bait on an extra hair from the eye of the hook facing the wrong way.

rhinosphenoid = a small plate-like median bone forming a septum between the olfactory nerves as they issue from the orbitosphenoid, e.g. Characoidei such as *Lotabrycon*, *Rhaphiodon*.

rhipidion = the distal opening of the tube formed by the claspers when held together. Fan-shaped for dispersing sperm in a radiating spray during copulation.

rhipidocercal = tail of expanded, fan-shaped form (as opposed to one of tapering form or oxy cercal), e.g. in *Polyodon*.

rhipidoid = fan-shaped.

rhithral = adjective for rhithron.

rhithral zone = the upper reaches of a river characterised by well-oxygenated water, low temperatures (less than 20°C), fast and turbulent current, clear water and a bottom of large-sized sediment.

rhithrocoa = the biotope and biocenosis of the rhithral zone.

rhithron = the organisms inhabiting the rhithral zone. upper reaches of a river characterised by well-oxygenated water, low temperatures (less than 20°C), fast and turbulent current, clear water and a bottom of large-sized sediment.

rhizobenthos = organisms rooted in the substrate and well extended into the water column.

rhombencephalon = the hindbrain, the rearmost part of the developing brain. The rhombencephalon divides into the metencephalon (anterior) and the myelencephalon. Details of the brain structure of a fish (*Danio rerio*) may be found in Wullmann *et al.* (1996). See also brain.

rhombic scale = rhomboid scale.

rhomboid = diamond-shaped.

rhomboid scale = ganoid scale (a non-overlapping or partially-overlapping scale, often rhomboidal in shape, with thick outer ganoine layer (enamel-like substance), a middle layer of dentine and an inner dermal, cosmine bony layer. Grows by addition of material above and below, e.g. in Lepisosteidae, Amiidae and Polypteridae. Lepisosteidae have lost the dentine layer. The scales of Lepisosteidae are called lepisosteoid scales as distinct from paleoniscoid scales of Brachiopterygii).

rhomboidal = shaped like a rhomboid - a non-rectangular parallelogram; wedge-shaped. Said of a caudal fin that has the middle rays longest and the fin sides roughly straight.

rhombomere = the hindbrain segment or neuromere.

rhyacium = a torrent community.

rhyacophilous = torrent-loving.

rhymes = see under Quotations as the letter Q lacks piscine entries.

rhynchichthys = the late postlarval stage of Holocentridae characterised by the presence of rostral, preopercular, opercular and supraoccipital spines and a silvery colour.

rhyne = 1) a deep drainage channel. A dialect word of southwest England. Spelled reen in Wales.

rhyne = 2) rhine; a more varied definition.

rib = one of a series of long, thin bony rods articulating with the apophyses of the vertebrae and supporting the trunk musculature. The ventral ends are free. They consist of two types: the

dorsal, epipleural or true ribs which arise from the transverse processes and lie in the transverse septum of the epaxial muscles (homologous to those in tetrapods) and the ventral, pleural, or pleuroperitoneal ribs which lie just outside of the body cavity. Pleural ribs are found in Elasmobranchii, pleural and dorsal ribs in Teleostomi; ribs are lacking in Holocephali. The intramuscular bones of the horizontal septum are homologous with dorsal ribs. Haemal ribs (*q.v.*) is a misnomer for the ventral ribs.

rib wall = an artificial structure across a stream below a dam or weir used to raise the water level; fish can use this in place of a fishway as it slows down water flow.

ribbed = a surface with a series of ridges.

ribbon reef = a large, offshore and linear reef, seaward of a fringing reef, which is elongate but does not form a barrier to the land. Also called shelf-edge reef and sill reef.

ribbon tail = in angling, a plastic worm with a long tail that wiggles when retrieved.

ribline = a heavy line or chain running the length of a trawl net to add strength.

rice paddy = a field for growing rice, flooded with water and often stocked with fish. See paddy-cum-fish culture.

rice the water = to throw plants and branches into a river in order to frighten salmon before using a spear or leister. The effect is to stupefy the fish so they lie motionless.

richness = the total number of species in a unit area. May be expressed as the number of species divided by the total number of individuals.

rick = to hook or pierce a fish.

Ricker curve = named for William Ricker, a Canadian fisheries biologist, this is a mathematical model of fish population dynamics. A graph of mature progeny and spawners is used to determine average maximum catches for a fishery. One line on the graph is the line of natural replacement where spawners are replaced by an equal number of progeny. The natural equilibrium point is where spawners equal progeny without fishing. Past this point crowding is a factor depressing the numbers of fish through egg loss on spawning beds. A curved line shows the maximum sustainable catch (see Ricker (1975) for details).

rictus = 1) the junction of the premaxilla and maxilla; the corner of the mouth in fishes.

rictus = 2) the expanse of an open mouth, generally.

rictus = 3) a gaping grimace, usually in humans.

rid = redd.

riddles:-

1) = the tail of the beaver was classified as fish in the Middle Ages, giving rise to the riddle "What swims like a fish, tastes like a fish, is a fish, and yet is not a fish?".

2) = Alive without breath,  
As cold as death;  
Never thirsty, ever drinking,  
All in mail never clinking.

Answer: fish (from "The Hobbit" by J. R. R. Tolkien).

3) = 1. In a street there are five houses, painted five different colours.  
2. In each house lives a person of different nationality.  
3. These five homeowners each drink a different kind of beverage, smoke a different brand of cigar and keep a different pet.

The question: who owns the fish?

Hints

1. The Briton lives in a red house.
2. The Swede keeps dogs as pets.
3. The Dane drinks tea.
4. The Green house is next to, and on the left of the White house.
5. The owner of the Green house drinks coffee.
6. The person who smokes Pall Mall rears birds.
7. The owner of the Yellow house smokes Dunhill.
8. The man living in the centre house drinks milk.
9. The Norwegian lives in the first house.
10. The man who smokes Blends lives next to the one who keeps cats.
11. The man who keeps horses lives next to the man who smokes Dunhill.
12. The man who smokes Blue Master drinks beer.
13. The German smokes Prince.
14. The Norwegian lives next to the blue house.
15. The man who smokes Blends has a neighbour who drinks water.

Answer: The German.

4) = What has cities, but no houses; forests, but no trees; and water, but no fish? Answer: a map.

ridge = the line or elevation separating two river systems.

riest = reest.

riffle = a shallow stream habitat with broken or choppy surface water and moderate to fast current. Gradient is about 1-4%.

rift = a shallow or rocky place in a stream, forming a ford or rapids.

rig = 1) the arrangement of fishing gear, the style varying between species sought. Refers to the terminal tackle (hooks, lures, etc) but may also refer to an outfitted boat. Used in both angling and commercial fishing. Angling rigs have various storage containers for transport and protection including rig bins (a round, plastic screw top container with a foam insert attached to the middle of the lid - the rig is wound around the foam) and rig pouches (a wallet with a zipper around three sides containing plastic sleeves to place rolled up rigs in).

rig = 2) arranging the fishing gear of a rig.

rig = 3) the backbone or spine of an animal, including fish (Scottish dialect).

rig tube = silicone rubber or shrink tubing surrounding an angling rig to protect the line from sharp rocks and from becoming tangled.

right = a right to catch a specified quantity of fish, a proportion of the total allowable catch, to use a boat or any other specified fishing equipment, in a manner specified in a management plan or in fishery regulations.

right bank = the right side of a river when facing downstream.

*rigor mortis* = literally the stiffness of death; in fish occurring about 8-24 hours after death and resolving after about 1-3 days, varying by species, ambient temperature, nutritional status, amount of exercise by fish before death, etc.

rill = a creek, a small brook, a rivulet.

rille = rill.

rim control reel = a fishing reel with part of the spool exposed so that the angler can control drag by touch.

rin snips = to divide profits equally as in a fish catch among the crew (Scottish dialect).

rind = a large piece of bark from a fir tree used to cover fish piles in Newfoundland.

ring = 1) the British word for the North American term guide, the series of rings along a fishing rod through which the line feeds.

ring = 2) circles in the water caused by a rising and feeding fish.

ring = 3) a region of similar structure or optical density laid down during growth of hard parts used in ageing. Also called band, mark and zone.

ring of the fisherman = a gold papal seal used on documents and placed on the new pope's finger by the cardinal camerlengo. It has a representation of St. Peter fishing in a boat with the new pope's name around it.

ring intestinal valve = an intestinal valve with a radius lower than that of the gut so the valve is internally open and some food can pass through without coming in contact with the valve.

ring net = a modified lampara net with purse rings operated by two vessels (a lampara net is similar to, but much smaller than, a purse seine with no pursing action used for catching schools of small fish attracted to lights, e.g. anchovy and pilchard. There is a central spoon-shaped section and two lateral wings and the net is usually operated from a small boat. The rapid retrieval of the lead line does close the bottom of the net but it is not a true purse).

ring trawl = a coarse mesh plankton net used to collect fish larvae.

ring worm = in angling, a plastic worm with ridges said to be life-like to fish.

ringe = reenge.

ringer = 1) a dead fish embryo characterised by a dark central area and a light rim of germ cells. Used in hatcheries to pick out and discard dead embryos.

ringer = 2) a fisherman using a ring net.

rings = circular structures on scales and bones laid down annually and indicative of age and growth.

rip = 1) a stretch of broken water in a river.

rip = 2) a narrow band of current, flowing seaward through the surf.

rip = 3) the process of cutting open a fish from under the lung bones to the vent, after the throat has been cut.

rip = 4) removing the gills and intestines from herring or mackerel (Newfoundland).

rip = 5) a round pannier or basket, sometimes used in pairs and slung on each side of a horse for carrying loads, such as fish, or individually for coiled fishing lines (Kent and Scottish dialects).

rip current = rip (2).

rip-jigging = jigging in areas with thick vegetation. The jig is allowed to settle in the weeds and then a strong pull rips the jig through them, cutting the weeds, and the process repeated.

riparian = pertaining to lake, river or stream banks.

riparian rights = those rights belonging to a person owning land bordering a watercourse, concerning its bank, bed and waters.

ripe egg = a mature egg.

ripe fish = one which is ready for spawning.

ripening = 1) the process of becoming a ripe fish.

ripening = 2) maturing of small fatty fishes, e.g. anchovies and herring, in salt, sugar and spices in barrels over several months. Proteins and lipids are degraded by enzymes from the pyloric caeca of the fish and a product known as semi-preserves results that must be kept chilled.

ripier = ripper (3).

rippar = ripper (3).

ripper = 1) a hook or series of hooks pulled rapidly through the water to impale fish. Fish may also strike at the moving hooks.

ripper = 2) a hard fighting fish that pulls or rips line off the reel.

ripper = 3) a seller of freshwater fish at markets (archaic). The men carried baskets of fish from the coast to inland markets. Also called rippier, ripier, rippar.

ripper = 4) a sharp knife used to gut or dress fish.

ripper-fishing = fishing for cod where the boat is allowed to drift with the tide from one point to another, the distance between these being termed a scarce.

rippie = a circular net used to poach salmon (English and Scottish dialects).

rippier = ripper (3).

ripping = retrieving a fishing lure fast enough to cause it to splash at the surface. Also called burning or buzzing.

ripping hook = ripper.

ripping side = setting hooks every ten feet on a drifting line intended to snag a fish. Also called sweet jigging.

riprap = large rocks or artificial structures used to stabilise stream banks or protect areas subject to wave action against erosion.

riprap net = a modified bar net with ropes at a diagonal instead of bars (a bar net is a gill net with ropes or wooden bars attached vertically used as a gill net or a trammel net).

rise = 1) the action of a fish coming to the surface to feed. The type of rise (dimpling the water surface, splashing, etc.) can indicate the food item and therefore the type of artificial fly to use.

rise = 2) an increase in the number of meshes per row in making a fish net.

rise end = the rear portion of a cod's vertebral column, curving slightly upwards near the tail (Newfoundland).

rise line = a rope attached to the bottom of the doors of a cod-trap and used to close the entrance before the net is hauled to the surface.

riser = 1) a fish that rises.

riser = 2) in aquaculture, the vertical part of a water controlling device, e.g. a monk, *q.v.*

riser = 3) rizzer.

rising tide = flood tide (rising or incoming tide; the period between low water and the succeeding high water. Flow enters an estuary during a flood tide).

rist = reest.

*rite* = properly, correctly, according to the rules.

rival = pertaining to a stream or rivulet.

river = a flow of water in a natural channel, larger than a stream (or a large stream, see stream). Some languages have words for rivers of varying sizes; in English a river can vary from a small water body that can be waded across (especially in deserts) to channels navigable by ocean-going ships. There is no equivalent to fleuve in French which means a very large river usually running into the sea. See also youthful, mature, old and rejuvenated rivers.

river basin = total land area drained by a river and its tributaries.

river classification = rivers or sections thereof are classified by geological aging. Young river sections are usually at headwaters and have low fertility but high oxygen levels, middle-aged river sections are further downstream and more fertile while mature sections are deep, slow-moving, highly fertile and have low oxygen levels.

river continuum concept = the theory describing the physical and biological succession in a river throughout its course.

river development = the degree of departure of a stream from a straight course.

river head = the confluence of a river and the sea.

river kilometre = distance from river mouth or other known locality to a specific site. Abbreviated as Rkm. Note that rkm is the distance between two points along a river.

river mile = distance from river mouth or other known locality to a specific site. Abbreviated as rmi.

river mouth = the outfall of a river.

river plume = river water, often turbid, beyond the estuary or river channel.

river warden = a guardian of the usage of salmon and trout streams under regulatory control.

river-type fish = anadromous fish that live for a year or more in rivers before migrating. See also ocean-type fish.

riverain = pertaining to a river bank or the general vicinity of a river.

riveret = rivulet.

riverhead = the source of a river.

riverine = pertaining to a river, river-inhabiting.

riverkeeper = the lead person in an organisation devoted to the environmental welfare of a particular river. Usually a citizen-based, independent organisation fostering links with community groups, private individuals, scientists, local governments, NGOs, and others.

riverlet = a small stream or brook, though rivulet is more commonly used.

riverside = ground along a river bank.

rivery = 1) river-like, resembling a river.

rivery = 2) abounding in rivers.

riving = pushing a pointed rod under one gill cover and out the mouth of a small fish so it can be carried or hung for smoking.

rivulated = marked by irregular streaks.

rivulet = a small stream or brook.

rizer = rizzer.

rizzar = rizzer.

rizzer = to dry, parch or cure fish by exposing them to the sun (Scottish dialect).

Rkm = river kilometre ( distance from river mouth or other known locality to a specific site).

rkm = the distance between two points along a river.

roach = 1) the cyprinid fish *Rutilus rutilus* of Europe.

roach = 2) the upward curve in the foot of a square sail. From the convex profiles of this fish. See also roach-backed and roach-bellied.

roach = 3) used incorrectly for certain North American sunfishes (Centrarchidae).

roach-and-dace = face (rhyming slang). Roach and dace are European cyprinid fishes.

roach-backed = convex in profile, as in the body shape of a roach (Cyprinidae, *Rutilus rutilus*).

roach-bellied = roach-backed.

road = not usually a habitat for fishes, except possibly walking catfishes, in its terrestrial meaning. The word also means a place where ships can ride at anchor some distance from shore. Usually in the plural and occurs in place names.

roads = plural of road.

roadstead = road as defined above.

robust = strongly or stoutly built, husky; said of fish body shape and form.

robustness = the capacity of a population to persist in the presence of fishing.

rock fishing = the sport of catching fishes from rocks, cliffs and breakwaters, popular where these conditions prevail but often dangerous.

rock salmon = a commercial name for fish sold in fried-fish form in Britain. Used for fish not known to the public or the vendor, or for fish of ungainly appearance or poor reputation. Often a small shark, *Squalus acanthias*.

rock-hopper trawl = a demersal otter trawl with rubber disks attached to the groundrope and to a second rope off-centre. When the trawl encounters an obstruction on the sea bed, the groundrope and the second rope wind around each other and accumulate tension, eventually when the tension is too high the trawl hops free.

rock-ramp fishway = a structure allowing fish to pass a barrier. Large rocks and timbers are used to build pools and small falls that mimic natural structures. This fishway only works over short distances because of the length of the channel needed for the ladder. See also pool-and-weir ladder, vertical slot fish passage and DeNiel fishway.

rocker bone = a prominent, median, bean-shaped bone in Ophidiidae and Carapidae which is drummed against the anterior end of the gas bladder for sound production. Also called a cuneiform bone.

rockfish = 1) a term for a wide variety of unrelated fish species, including members of the family Sebastidae.

rockfish = 2) a cod split, washed and dried on rocks.

rockhopper disc = rubber discs cut from old car tyres on the groundrope of a trawl as protection against snagging.

rod = 1) a device to carry and project a fishing line, hook(s) and bait or lures. The construction of rods is both a craft and a science and there is an immense variety of types, often specialised for particular species. Originally made of wood (split cane), now made of fibreglass, graphite/fibreglass or kevlar.

rod = 2) an elongate, rod-shaped cell in the eye sensitive to dim light.

rod = 3) spawn of a fish. Also spelled rodd, roid, rud and rude.

rod = 4) the act of spawning. Also spelled roid and rude.

rod belt = a leather or plastic belt worn on the waist and used to fight large game fish. The rod butt sits in a belt socket and helps fight the fish by relieving strain on the arms.

rod hand = the hand used to hold the fly rod when casting; as opposed to the line hand.

rod holdall = a large waterproof bag with straps for carrying, used to transport rods, poles, bank sticks, etc.

rod holder = a device attached to a boat in which a rod can be placed, especially when trolling large baits.

rod licence = in Britain, all coarse anglers must have an annual or temporary licence.

rod pod = an adjustable metal stand allowing several fishing rods to be set up side by side. It can be set up on uneven ground or on ground that is too hard for banksticks to be pushed in. It has two forked legs joined by a central support bar. A buzz bar can be used in place of the central bar, supporting several rods with bite alarms and swing indicators.

rod rest = a system for holding a fishing rod when engaged in float fishing or ledgering. A metal bar or bankstick is pushed into the river bank and a rod rest is screwed into its top end. The rod rest can be a simple, fixed U- or Y-shape or various adjustable types. May support both the top and butt of a rod. Called sand spike in North America.

rod taper = the taper of a fishing rod determines how it bends, e.g. fast taper rods have their action in the tip, slow taper rods have a through action and compound taper rods show elements of both of these.

rod tube = stiff plastic tubes with caps for storing fishing rods.

rodd = rod (3 and 4).

rodlet cell = a pear-shaped cell with a distinct capsule found in various tissues of fishes but lacking in Elasmobranchii. It has a nucleus at the mid-end and longitudinally oriented rodlets. In epithelia it is oriented parallel to the epithelial cells with the distal end containing the nucleus, distal to the lumen; in connective tissue, no particular orientation has been noted. Has been thought to be a parasite, perhaps a sporozoan, and has even been given a scientific name (*Rhabdospora thelohani*). But typical nuclear stains do not take in the rodlets, so it seems unlikely that the rodlets are nuclei of a parasite. Tests show the rodlets are protein with varying amounts of attached sugars, probably in the form of a neutral glycoprotein. The function is likely secretory and is perhaps involved in ion transport.

roe = the mass of eggs in the ovary. Soft roe refers to the male gonad, hard roe to the female gonad. Roe may also be used to indicate the female of a species, e.g. roe shad is female, buck shad is male (*Alosa sapidissima*). Roe is often eaten as caviar but can be mashed with oil, onion and pepper, or curried, e.g. roe of the clupeid *Hilsa ilisha* in India and Bangladesh.

roe bag = fish eggs used as bait for such species as Pacific salmons, enclosed in a mesh bag to keep the eggs together. Also called spawn bag.

roed (adjective) = full of roe.

roen = the roe of fish (Cumberland dialect).

roid = rod (3 and 4).

roll = 1) rotation of a swimmer around its horizontal or anteroposterior axis.

roll = 2) capelin (*Mallotus villosus*) schooling in inshore waters and being swept onto beaches at high tide when spawning.

roll cast = a fly fishing cast where line is rolled directly off the water; used where a back cast is not possible because of overhanging trees for example.

roll line = a set line on a forked wooden prong, lightly fastened and unrolling easily when a fish bites.

rolled up pickled herring = zavinac, the term used for the @ sign in email addresses in Slovakia and the Czech Republic.

roller = male capelin (*Mallotus villosus*) at spawning time.

rolling = moving brine containers to prevent fish from sticking together and to evenly distribute salt.

rolling hitch = similar to a clove hitch, q.v., except that it has an extra turn ahead of one of the half hitches. Used to make one line fast to a heavier line. Various websites have animated steps showing how to tie this knot.

rolling leger = fishing with a weigh in running water such that the rig rolls and bounces along the river bed.

rolling splice = a knot used to tie a braided backing line to a fly line. Various websites have animated steps showing how to tie this knot.

rolling stones = a gene name for a zebrafish mutation affecting the ear (loose otoliths). See also einstein, half stoned, what's up, van gogh, among many others.

rollmops = marinated herring fillets wrapped around onion slices and held together with tooth picks or cloves. Packed in mild vinegar and acidified brine and with spices and various sauces. See also hangover breakfast.

Roman numerals = used in ichthyology to indicate spines as opposed to soft rays in fish fins, and may also appear on older European literature as year of publication:-

I = 1, II = 2, III = 3, IV = 4, V = 5, VI = 6, VII = 7, VIII = 8, IX = 9, X = 10, XI = 11, XII = 12, XIII = 13, XIV = 14, XV = 15, XVI = 16, XVII = 17, XVIII = 18, XIX = 19, XX = 20, XXI = 21, XXX = 30, XL = 40, L = 50, LX = 60, LXX = 70, LXXX = 80, XC = 90, C = 100, D = 500, M = 1000.

romanization = conversion of non-Roman script into Roman letters (a, b, c, etc).

ron = roun.

rone = roun.

roof = netting covering the top of an open cod trap, installed to prevent fish from escaping.

roog = a spawned fish or a poor fish in a catch (Scottish dialect). See also roogie.

roogie = the adjective for roog.

rookie = ruggie.

rookit = a ball of minced fish mixed with breadcrumbs, a rissole (Scottish dialect).

room = 1) fish room or hold (an enclosed space on a vessel for storing fish; may be insulated and/or refrigerated).

room = 2) fish room (a piece of land by the shore from which a fishery was conducted in Newfoundland).

room = 3) fish room (the stages. *q.v.*, flakes, *q.v.*, stores, crew and family housing, and other facilities where a fish catch was landed and processed in Newfoundland).

room = 4) a small building for storing dried and salted cod in Newfoundland.

room = 5) fish top (a movable box-like structure to cover piled cod-fish. Also called fish house).

room holder = occupier of fishing premises or fish room.

roomer = migratory fisherman from Newfoundland who conducts a summer fishery from a room on the coast of Labrador.

root = the non-enameled tooth part, forming the junction with the jaw and providing vascularisation of the tooth (Herman *et al.*, 1994).

root coating = the coating on the upper part of the tooth root, usually enameloid in Chondrichthyes (Herman *et al.*, 1994).

root effect = the decreased ability of blood to load oxygen when the carbon dioxide tension is increased (and pH is below a certain value).

root stem = the root part of the tooth in Chondrichthyes between the crown base and the root lobe section (Herman *et al.*, 1994).

rooting = fish feeding by probing the bottom sediments.

rootwad = a mass of roots from a tree that provide shelter and nutrients for a fish.

rope trawl = the netting of the front part of a four-seam trawl made of plaited warps running parallel for a few meters. The aim is to save energy required for towing by decreasing the resistance of the gear. Also called spaghetti trawl.

ropy brine = a defect in brine where the sugar content has been converted to a polysaccharide giving a slimy, stringy consistency.

ros = ross.

Rosa Lee phenomenon = use of comparative specimens of smaller or larger size than the test specimen results in an over-estimation or an under-estimation respectively of the total length of the fish. This influences back-calculation of fish sizes using proportional methods due to changes in relative growth rates. If mortality is higher for larger fish, population size-age relationships (i.e. growth equations) based on a single sample or repeated sampling of a single cohort will underestimate individual growth.

rosary ponds = a series of fish ponds with water flowing from one to the next.

roseate = flushed pink.

rosette = arranged in a fashion resembling a rose; rose-shaped.

ross = keeping a fishing line clear of the bottom by lowering it to the sea floor and then raising it a short distance, or to move it up and down to attract fish (Scottish dialect). Also spelled ros.

rostra = plural of rostrum.

rostral = 1) relating to the snout or rostrum.

rostral = 2) towards the snout or rostrum. usually means anterior.

rostral bar = an anterior extension of the skull in some members of the Rajidae.

rostral bone = 1) the paired superficial dermal bone covering the ethmoid anterior to the eye in Holostei.

rostral bone = 2) a tooth bearing bone modified from an illicium on the tip of the snout of Lynophrinidae.

rostral cartilage = an element in the olfactory region skeleton.

rostral fin = subrostral fin (a shelf-like projection extending forward under the rostrum of Myliobatidae).

rostral fold = a groove between the lip and the snout.

rostral hook = the hooked section of the snout overhanging the mouth in Cynoglossidae.

rostral organ = an electroreceptive organ in the form of a cavity on the snout of the coelacanth (*Latimeria chalumnae*) filled with gel and connected to the exterior by three pairs of canals. It has an insulating layer of adipose tissue and is innervated by the superficial ophthalmic nerve. Probably used to detect prey in the dark.

rostral plate = a small plate on the anterior tip of the snout, e.g. in some Agonidae.

rostral spine = a spine of the rostral plate.

rostral teeth = tooth-like projections on the sides of the snout of Pristidae and Pristiophoridae. They lack a basal plate typical of other elasmobranch teeth and are made of orthodentine and vitrodentine with a pulp cavity filled with osteodentine.

rostral tubule = a network of branching canals which may carry either nerve fibres to surface sensory organs or capillary blood vessels in dipnomorph Sarcopterygii.

rostrum (plural rostra) = 1) any projecting snout or beak.

rostrum (plural rostra) = 2) produced anterior part of the skull, e.g. in Elasmobranchii and Acipenseridae.

rostrum (plural rostra) = 3) the bony shelf overhanging the cavity where the esca of Ceratiidae is housed.

rostrum (plural rostra) = 4) the longer lip of the ostium of the sagittal otolith. Generally longer than the antirostrum.

rot oil = cod liver oil processed by decomposition.

rotational fishery = exploitation by means of alternatively open and closed areas, i.e. high fishing intensity followed by a fishing ban.

rotenone = a fish poison derived from the roots of the jewel vine plant, *Derris elliptica*, *D. lagensis*, *D. malaccensis*, and *D. uliginosa* (Leguminosae). Lacepod (*Lonchocarpus utilis* and *L. uruca*), the yam-bean (*Pachyrhizus erosus*) and hoary pea (*Tephrosia* spp.) are also used. Often used to eliminate unwanted fishes from waters before stocking with game fish and by ichthyologists as a collecting tool. It acts as a respiratory toxin, adversely affecting mitochondrial action by blocking electron transport - the fish asphyxiate. Available under many trade names. Other piscicidal plant chemicals include callicarpone, huratoxin, ichthyothereol, inophyllolide, juglone, justicidin, maingayic acid, and vibsanine, all q.v.

rotskjae = fish split in two except for a short section of the tail ready for hanging and air drying (Norway).

rotted = cod-liver oil rendered by decomposition of the livers in a barrel.

rotting nose disease = the formation of small, grey, pin-hole abrasions around the nose that eat at the flesh, leave the fish open to secondary infections, and eventually can kill the fish. Attributed to malnutrition and found in such fishes as oscars (the cichlid *Astronotus ocellatus*).

rouelle = thin slices of fish cut perpendicular to the backbone. Usually mackerel (France).

rough fish = those fish which are not sought for sport or food because of a perceived poor fighting or eating quality.

roughage = in aquaculture, a feed containing a high percentage of indigestible constituents such as cellulose.

roughie = ruffie.

round = a single row of netting going the full extent of the cod trap (Newfoundland).

round brackets = 1) (.....), placed around the author name and date of publication of a scientific name to indicate that the species name or epithet is now placed in a different genus than that of the original description.

round brackets = 2) (.....), placed around a subgenus or former genus name between the genus and species names.

round cure = salt round fish (whole ungutted fish cured with salt). Also called round salted fish, bulk cure, kench cure, salt bulk and bulk salted fish).

round dan leno = dan leno hoop (a hoop-shaped dan leno made of bent wood with short rigging ropes wired to the outer circumference. Also called dan leno ring, geer, hoop, hoop bridle and yoke hoop).

round fish = fish in the "round" - not cleaned, without the head, the fins and guts removed.

round haul seine = a wall of seines arranged in an arc or semi-circle, the two ends being brought together and the bottom being at least partially closed to capture and concentrate the school, and the fish transferred on board a boat.

round salted fish = salt round fish (whole ungutted fish cured with salt. Also called round cure, bulk cure, kench cure, salt bulk and bulk salted fish).

round shore herring = herring salted just as they come from the water.

round strap = one of a series of ring-shaped ropes encircling the codend or the strengthening bag of a trawl. Used to restrict stretching of the codend.

round-tail = a small cod gutted, headed and salted but not split.

round weight = the weight of the whole fish before processing or removal of any part. Same as fresh weight or live weight.

round-bend hook = a hook with a wide gape used for large baits.

rounder = 1) a demersal fish landed before being gutted; usually it is gutted at sea.

rounder = 2) dried and salted cod split insufficiently towards the tail (Newfoundland).

roundhauler = an endless trolling line (a slowly moving looped trolling line. The line is carried down to a specific depth, returned to the surface, passes over the vessel so that the catch can be removed and hooks re-baited, and then on down again).

rounding bias = a bias arising from the tendency of people to round off numbers to end in 0 or 5; important in angler surveys where catches are recorded from interviews. Also called digit bias.

roun = the role of a fish (archaic). Also spelled rowin, roune, ron and rone.

roune = roun.

rouny = consisting of roe (Scottish dialect).

rouse salt upon salt = to change the pickle in curing fish.

roused fish = fish mixed with dry salt before further handling and processing.

rousing tub = a container in which preliminary salting is carried out.

ROV = abbreviation for remotely operated vehicle.

rovack = the tail piece of a fish, especially a dried strip from the back of a dogfish, *Squalus acanthias* (Scottish dialect). Also spelled rovek and rovik.

rovek = rovack.

rovik = rovack.

row = fish teeth arranged in the mesial-distal direction across the jaw, e.g. in sharks. Such teeth are all at the same development stage. In a dentition with imbricated/pavement teeth, adjacent teeth in a row may have slightly different ages, cf. file, diagonal file and tooth row.

rowan cast = a part of a river where roe is favoured as a bait (Scottish dialect).

rowan gatherer = a name for the brown trout, *Salmo trutta*, because of its fondness for salmon roe.

rowboat = a boat propelled by oars.

rowin = roun.

royal fish = sturgeons (*Acipenseridae*) are royal fish in the United Kingdom and catches belong to the reigning monarch. A statute to this effect dates back to the reign of Edward II (1284-1327). See also Receiver of Wreck and coroner of the seas.

royal Wulff dry fly = a series of fly patterns designed by Lee Wulff; bushy and high floating flies visible in rough water and at twilight.

rubber = false belly or chafing gear (any materials attached to wear points on nets). Attached below the belly of a trawl.

rubbish = any marine fish other than salmon and cod (Newfoundland).

rubble = stones of small or medium size, 76-305 mm diameter.

rubble = 1) irregular-shaped rock fragments of varying size.

rubble = 2) substrate particles in streams between 64 and 256 mm in diameter.

rubble zone = the shallowest part of a reef crest landward of the palmata zone. It consists of broken pieces of coral washed back by storms.

rubric = a section of a key; two rubrics form a couplet.

ructus = eructation (burping or belching is the release of gas from the digestive tract. In fishes this may be from the vent, or from the gas bladder connected to the gut via the pneumatic duct, and thence the mouth. Some eructations may be just emptying the gas bladder but others appear to be a deliberate sound production as it does not vary over time, e.g. in certain eels and catfishes).

rud = rod (3 and 4).

rude = rod (3 and 4).

rudimentary = very small and poorly formed; undeveloped; imperfectly developed.

rudimentary ray = a simple fin ray usually an unbranched, unsegmented soft ray, often too small or obscure to include in counts.

ruffie = a torch made from a brand of log fir or a wick of rag smeared with tallow and used for salmon fishing at night (Scottish dialect).

ruffy = ruffie.

rug = a pull or tug on a fishing line when a fish has been hooked; a bite (Scottish dialect).

rusa (plural rugae) = a ridge or fold, e.g. of the digestive tract that permits expansion and contraction.

rugae = plural of rusa.

rugg = rug.

ruggie = an undersized cod (Scottish dialect). Also spelled rugby or rookie.

ruggy = ruggie.

rugose = wrinkled, corrugated, rough.

rugosity = a ridge or fold.

rule = in taxonomy, a mandatory Article of the International Code of Zoological Nomenclature.

ruling = a decision by the International Commission on Zoological Nomenclature published in an Opinion (q.v.), Declaration (q.v.) or Direction (a term no longer used in the code).

rumbal whitings = an old tradition at Folkestone where eight of the largest and best whiting were chosen out of every boat and sold separately. The money from this sale funded a Christmas feast, called a rumbal, for each boat crew. May originally have been an offering for St. Rumwold, to whom a chapel was dedicated near Folkestone.

Rumble Fish = a novel by S. E. Hinton and an avant-garde 1983 film directed by Francis Ford Coppola. One of the characters is fascinated by a Siamese fighting fish (*Betta splendens*) which he calls rumble fish.

run = 1) transitional segments of streams, between a riffle and a pool, with moderate to fast current and depth, little or no turbulence and a smooth water surface.

run = 2) seasonal migration undertaken by fish, usually as part of their life history.

run = 3) increased catches of fish, a usage often independent of their migratory behavior.

run = 4) the direction in which netting is braided.

run = 5) the regular movement of vessels between ports.

run = 6) the movement of a hooked fish trying to escape and the line pulled out in the process.

run = 7) a school of fish.

run = 8) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

run = 9) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for salmon.

run = 10) a narrow strait or extended navigable passage between the coast and an island or islands.

run and gun = an angling method where only fish that strike quickly are caught, the angler fishing one area with a few casts and then "gunning" the boat motor to travel to the next area.

run clip = a plastic clip trapping the fishing line against the rod just above the reel. Used when legering. It releases when the fish runs with the bait.

run down = backwash (the seaward return of waves after they rush up onto the beach. Some fish species spawn in this wave action, e.g. capelin, *Mallotus villosus*. Also called backrush).

run-of-river = allowing flow of water through dam turbines at a constant speed, thus facilitating fish movements and migrations.

run-of-the-river dam = lowhead dam (a dam extending across a river of low height, usually 15 feet (about 5 metres) or less. It impounds the water behind it, has minimal effects on the downstream regime and allows water to fall over its whole width. Quite dangerous as boaters and swimmers may not see it until too late and can be caught in the backwash beneath the dam. Also called channel dam).

run reconstruction = a post-season assessment of all fish that escaped and all those that were harvested from individual stocks or management areas.

run-of-river impoundment = an impoundment having a high rate of flushing.

run-up = the rush of water up a structure such as a beach on the breaking of a wave. Also called uprush and swash.

runlet = a small stream.

runnel = a rivulet or brook, a narrow channel for water, a small stream.

runner = female sturgeon caught before the eggs are ripe.

running = 1) flowing as with water.

running = 2) current as with costs.

running lead = the British word for the North American term slip sinker (a lead or other metal weight having a hole through its centre, sliding freely up and down the fishing line).

running leger = a rig in angling where the line runs freely through the leger weight offering little resistance to the fish.

running line = a thin fly fishing line that connects at one end to a shooting head, q.v., and at the other to the backing on the reel.

running mark = a land feature lined up by a fisherman in order to locate the position of a fishing ground.

running paternoster = a paternoster rig (*q.v.*) where the weight is attached to a short link that runs freely on the line.

running ripe = ready to spawn as evidenced by a slight pressure on the abdomen causing eggs or milt to be shed.

running stick = a wooden device placed on the side of a dory and used as a guide for hauling trawls.

running water = any water body showing continuous unidirectional flow; water running from higher to lower elevations as in a river. Also called flowing water.

runoff = precipitation that flows across the ground and enters streams, rivers and lakes; may carry pollutants. Also used for the total discharge of a stream, both surface and subsurface, over a given time period. Defined as the depth to which a drainage area would be covered if all of the runoff for a given period of time were uniformly distributed over it.

runt = a stunted fish; one with less than usual growth for the species.

runting fish = runt.

russlet = kron-sardiner (1) small herring used as raw material for preserves, mostly in cans. The herring is eviscerated and headed and thoroughly washed (Sweden)).

russlet = kron-sardiner (2) small herring eviscerated, headed and vinegar cured for export (Norway)).

russlet = Kronsardinen ( marinated small herring or sprat, mostly from the Baltic Sea, sometimes with spices, sugar and other flavouring agents (Germany)).

rust disease = gold dust disease (an infectious disease caused by dinoflagellates evidenced by a golden or brownish dusty appearance on the fish skin through mucus production. The fish may show irritability, flashing, respiration difficulties and clamping of the fins. Very contagious and often fatal. Called velvet disease when *Oodinium*, coral fish disease when *Amyloodinium* and rust from the appearance).

rusting = yellowish or brownish discolouration often around the vent and belly and on cut surfaces causing a rancid flavour. Caused mainly by a reaction between fat oxidation products and nitrogenous substances when inadequately stored.

ryke = raik.

rynge = reenge.

## S

S = 1) survival rate ( number of fish alive after a specified time interval, divided by the initial number, usually on a yearly basis (Ricker, 1975).

S = 2) abbreviation for siemens, a measure of conductivity, q.v.

S = 3) Silurian, a geological period within the Palaeozoic ca. 441-113 million years ago. Most of the major groups of fishes are thought to have originated in the Early Silurian.

s = second.

$S_1$  = a salmon smolt that is transferred to sea water for on-growing after 1 year in fresh water ( $S_2$  = after two years).

s.a.p. = specific action potentiality (the state of an animal responsible for its readiness to perform the behavior patterns of one instinct in preference to all other behavior patterns; level of motivation).

s. ampl. = abbreviation for *sensu amplificato*, meaning in an enlarged sense.

s. l. = 1) abbreviation for *sensu lato*, meaning in the broad sense.

s. l. = 2) abbreviation for standard length.

s. lat. = abbreviation for *sensu lato*, meaning in the broad sense.

s. n. = abbreviation for *sine numero*, meaning without a number, unnumbered.

s. s. = abbreviation for *sensu stricto*, meaning in the strict sense, in the narrow sense.

s. str. = abbreviation for *sensu stricto*, meaning in the strict sense, in the narrow sense.

s-cast = an s-shaped cast of a fly line to put slack in the line when it lies on the water, reducing the effect of the current and minimising drag.

s-g. = subgenus.

s-gg. = subgenera.

S-cast = a fly line deposited on the water in an S pattern caused by side to side movement of the fly rod during the cast. It aims to put slack in the line and reduce the influence of current and so minimise drag.

sabiki rig = a line with 5-6 small flies tied to golden hooks. The line is dangled over the side of a dock where baitfish are found - once one fish takes a fly, others rush in and are hooked.

sabkha = an Arabic name for a salt-flat, with frequent evaporation leaving layers of clays and salts. The hypersaline environment is home to a restricted fish fauna.

sabulicolous = living in sand. Also called arenicolous.

sac fry = a newly hatched fry using the yolk sac as a food source (stages at 45°F in chinook salmon are green = 0 days, eyed = 38 days, sack (or sac) fry = 69 days, swim up = 92 days and button up = 115 days).

saccate = sac-like.

saccule = sacculus.

sacculi = plural of sacculus.

sacculith = sagitta.

sacculus (plural sacculi) = the middle and largest chamber of the inner ear, between the utriculus and the lagena, the other two chambers. It has a wide connection to the upper part of the labyrinth in Petromyzontiformes, cartilaginous fishes and primitive bony fishes but in advanced teleosts the connection is narrow and, exceptionally, it is completely separate, e.g. in *Aploodonotus*. Contains the otolith called the sagitta or sacculolith. Also called saccule.

soccus communis = the single otolith camera found in Myxini. See also canalis semicircularis.

soccus dorsalis = the highly vascularised roof of the telencephalon, part of the fish brain, q.v.

soccus vasculosus = a well-vascularised ventral projection of the infundibular wall of the brain situated just caudal to the pituitary, with its cavity opening into the third ventricle. May have a secretory function.

Sach's organ = a weak electric organ in the electric eel (*Electrophorus electricus*), transmitting a weak, 10V amplitude signal used in communication, orientation, locating prey and finding and choosing a mate.

sack = sack ship.

sack ship = a vessel used to carry migratory fishermen from Britain to Newfoundland, salt cod from Newfoundland to Europe and then sack (a light, dry strong wine) to Britain.

sacred cod = reputedly the fish Christ multiplied and fed to the multitude but ichthyogeographically incorrect.

Sacred Cod of Massachusetts = a codfish carved from pine that hangs in the House of Representatives chamber of the Massachusetts State House in Boston. It is symbolic of the importance of the historical fishing industry to the state. See also cod-napping and Holy Mackerel.

sacred fish = 1) various pools, wells and streams, particularly in the Middle East, contain fish that are purportedly sacred. There is a Pool of Sacred Fish (q.v.) at Şanlıurfa in southeastern Turkey. The temples of Apollo and Aphrodite in ancient Greece had sacred fish. See also holy fish.

sacred fish = 2) specifically, any one of several species of freshwater fishes of the family Mormyridae inhabiting the Nile considered sacred by the ancient Egyptians.

sacrifice = killing a fish for science. Smaller fish, examined for parasites for example, may be decapitated or the spinal chord cut through with scissors behind the head. Larger fish may be stunned and killed by a blow to the head or killed by an electric current. Modern techniques use an anaesthetic (MS-222, *q.v.*).

saddle = 1) pigment extending over the back like a saddle, usually not on the dorsal fins.

saddle = 2) an area where narrowing occurs before widening out again.

saddleback = the condition on fish with columnaris disease where a pale white band encircles the body, later developing a yellowish-brown ulcer in the centre of the saddle.

saddlepatch disease = columnaris disease (a systemic and skin disease of young-of-the-year freshwater fishes caused by *Flexibacter columnaris* (or *Flavobacterium columnare*). Usually occurs in summer and is associated with stress, crowding, injury and poor water quality. Virulent forms may show no external symptoms, less virulent forms show grey-white lesions on the body, fins and gills. Lesions first appear on the caudal fin and progress towards the head. Heavy infections appear yellow or orange. Scaleless fish show lesions comprising a dark blue area overlain by a milky veil and with a red-tinged margin. See also saddleback, saddlepatch disease, mouth fungus and mouth rot, depending on locality on body).

saedick = seddick.

safe = said of a species formerly threatened but now deemed to be relatively secure.

safe biological limit = a limit reference point, usually the stock biomass below which recruitment will decline substantially.

safe water = water that is not harmful to humans. Includes potable water (*q.v.*) but also extends to water used for swimming and cleaning, i.e. water with low levels of harmful chemicals, bacteria, etc.

sagger = a large boat-load of fish (Newfoundland). Also called swamper.

sagitta (plural sagittae) = the otolith in the sacculus, the largest of the otoliths except in Cyprinidae and Siluridae. Also called sacculith. It has been used for identification of species, for identification from remains in the diet of other organisms, and from remains in archaeological sites. The anterior end is pointed and the posterior end is rounded, straight or may be notched. Mesially it has a groove, the sulcus acusticus, which divides the otolith into dorsal and ventral halves and is margined by superior and inferior crests. The posterior branch of the acoustic nerve runs along the sulcus. The expanded anterior opening of the sulcus is called the ostium and has pointed margins, the longest being called the rostrum and the shorter the antirostrum. The posterior end is called the cauda (and may not extend to the otolith margin). The cauda may have dorsal and ventral points, the pararostrum and postrostrum respectively. A narrowing of the sulcus is called the collum and is the focus of sagitta formation. The upper rim is shorter than the lower rim and rims may be scalloped or have bulging domes.

sagittae = plural of sagitta.

sagittal = a plane that divides exactly the left and right sides.

sagittal crest = a longitudinal and median ridge on top of the head. May be bony or formed from soft tissues.

sagittiform = pike-shaped, dart- or arrow-shaped.

Sagun = a fried fish gift given in Newar communities in Nepal at weddings, birthdays, etc. Also includes eggs, meat, garlic, ginger and cereal pancakes. The fish should be eaten head first to please the deity.

sail = blow line (a light line used in angling that is carried by the wind, only the live or artificial bait touching the water surface. Called sail as it catches the wind).

sailing trawl = a small trawl dragged by a sailing vessel, having short wings kept open by being attached to long poles projecting from each end of the vessel.

sailor's purse = mermaid's purse (an egg-case of an Elasmobranchii, usually oblong with horns or tendrils).

saine = a variant spelling of seine.

Saint Peter's fish = the John dory or *Zeus faber*, so named because of the prominent pigment spots where reputedly Saint Peter picked it up and left his fingerprints (ichthyogeographically unlikely). See also St. Peter's mark and the devil's thumb print.

saippuakala = Finnish for soap fish.

saithe = bait, such as chopped limpets, cast into the sea to attract fish (Scottish dialect).

sakuraboshi = mirin-boshi (split fish usually without the head, dried after soaking in seasonings consisting of either soy sauce, sugar and sweet rice liquor (mirin), or salt, sugar and gelatine or agar (Japan)).

salachi = salachini.

salachini = whole pilchards, dry salted packed in barrels and pressed to about one-third of the original bulk; further fish are added to the barrel and the pressing continued until the barrel is full (Italy, U.S.A.). Also called pressed pilchards, fumadoes and salachi.

salad = a fish salad is cooked, marinated or salted fish that is chopped or diced and added to salad.

salaka = smoked fish product (former Soviet Union).

salina = a salt marsh, spring or lake, or an area of land encrusted with salt.

salinity = a measure of salts dissolved in a solution; the sea is 3.5% (35 parts of salts by weight per thousand parts of water, or 35,000 p.p.m.). Fresh water is <1000 p.p.m., slightly saline is 1000 - 3000 p.p.m., moderately saline is 3000 - 10,000 p.p.m., very saline is 10,000 - 35,000 p.p.m., brine is >35,000 p.p.m. and is water saturated or nearly so with salt. Inland waters are 0.5 -2.0 or less p.p.t. (sources vary), brackish waters are 0.5 to 2.0 - 17.0 p.p.t. and marine waters are on average 35 p.p.t. Note that there are saline inland waters which have higher salinity values than marine waters.

salinometer = a hydrometer used to measure the strength of sodium chloride solutions. Used in commercial preparation of fish. Also called brine gauge and brinometer.

salivary gland = a gland of unknown function on the floor of the mouth on either side of the tongue in Petromyzontiformes.

salmagundi = Solomon Gundy.

salmin = a term proposed to designate a toxic substance in the milt of salmon. Also referred to as a protamine. See also sturine.

salmine = salmin.

Salmofan = a fan-shaped colour scale or colour wheel, trademarked by Hoffman LaRoche, used to determine flesh colour in farmed salmon. Food additives determine flesh colour, without them it would be grey and somewhat unappetising.

salmon = 1) a member of the salmon family (Salmonidae) such as *Salmo* and *Oncorhynchus* species. The Atlantic salmon, *Salmo salar*, figures prominently in angling and fisheries in North America and Europe and has various terms peculiar to its sport and commercial fishery. Many of these terms are in dialects of English or are archaic. The same applies to brown trout of Europe (*Salmo trutta*) although to a lesser extent.

salmon = 2) a reddish-yellow or orange colour as with the flesh of salmon.

salmon = 3) a cant word for mass, probably a corruption of the French serment. Also spelled salomon.

salmon barrel = a wooden container for the export of dried, salted or smoked salmon (Newfoundland).

salmon bellies = Pacific salmon ventral sections hard salted in pickle. Also called pickled salmon bellies.

salmon berry = a large red raspberry growing from Alaska to California, the fruit of the *Rubus nutkanus*.

salmon berth = a station on inshore fishing grounds assigned by custom or lot to a salmon fisherman (Newfoundland).

salmon boat = an undecked boat used in the commercial salmon fishery (Newfoundland).

salmon box = shallow wooden container for the export of dried, salted or smoked salmon (Newfoundland).

salmon catcher = commercial salmon fisherman (Newfoundland).

salmon collector = buyer of salmon in the commercial fishery (Newfoundland).

salmon crew = people engaged afloat and onshore in the various operations of the commercial salmon fishery (Newfoundland).

salmon crib = a wickerwork trap for salmon migrating up a river (Newfoundland).

salmon disease = 1) a bacterial disease of salmonids.

salmon disease = 2) a parasitic disease fatal to dogs caused by eating raw salmon; found in the Pacific northwest of North America, one of the few places dogs have access to raw salmon. See salmon poisoning.

salmon egg bait = salmon eggs cured for use as bait for sport fishing.

salmon house = a structure in which salmon are split, salted and stored for export (Newfoundland).

salmon kail = a soup or broth made of salmon and vegetables (Scottish dialect).

salmon killer = the threespine stickleback (*Gasterosteus aculeatus*), although not noted for this ability.

salmon leap = any natural drop in a river up which migrating salmon jump.

Salmon letter = nothing to do with fish (properly). A letter sent to witnesses which informs them of any allegations that may come up, and the evidence for them, in their appearance before a tribunal or official inquiry. Named for Rt. Hon. Lord Justice Salmon. Confusingly, advocates of conservation of salmon stocks may couch their appeals to lawmakers in "salmon letters".

salmon loup = a small cataract.

salmon net = a type of net moored in inshore waters or river estuaries to trap salmon (Newfoundland).

Salmon of Doubt = posthumous material by Douglas Adams, author of the "Hitchhiker's Guide to the Galaxy", published in 2001. The full title is "The Salmon of Doubt: Hitchhiking the Galaxy One Last Time".

Salmon of Knowledge = Salmon of Wisdom.

Salmon of Wisdom = a salmon in Irish mythology that ate the nine hazel nuts that fell into the Well of Wisdom, thus acquiring all the knowledge in the world. The first person to catch and eat

this salmon would then acquire all this knowledge. The poet Finn Eces spent seven years fishing for this salmon and eventually caught it; but his apprentice, Fionn, in preparing it for him burnt his thumb on the hot salmon fat and sucked on it to ease the pain, thus acquiring the knowledge. Fionn became the leader of the Fianna, the famed heroes of Irish myth.

salmon oil = an oil as a waste from the salmon canning process, used in dressing leather and making soap.

salmon peel = a young salmon.

salmon pink = a yellowish-tinged pink colour.

salmon pipe = a device for catching salmon, not defined in more detail.

salmon plantation = an area of foreshore with or without buildings used by the commercial salmon fishery (Newfoundland).

salmon poisoning = a form of poisoning in dogs, other carnivores, and occasionally humans, commonly in the Pacific Northwest, from eating raw fish, especially salmon and trout, that are parasitized by the fluke *Troglotrema salmincola*, which serves as a vector for various rickettsiae. *Neorickettsia helminthoeca* causes haemorrhagic enteritis. See also salmon disease.

salmon post = salmon station.

salmon pound = an enclosure to trap migrating salmon.

salmon punt = salmon boat.

salmon rack = a type of obstruction to trap salmon migrating up a river (Newfoundland).

salmon salad = a delicatessen product made from cooked salmon, vegetables and sour cream. A German version is made of shreds from sliced, smoked, salted salmon mixed with mayonnaise.

salmon station = an area on the foreshore, or on the banks of a river, from which the commercial salmon fishery is prosecuted. May have buildings (Newfoundland).

salmon tierce = a wooden cask for the export of split and cured salmon (Newfoundland).

salmon trap = a box-shaped structure in inshore waters with a length of net stretching from the shore to the box entrance, leading the fish into the box.

salmon twine = a stout linen line used in the knitting of salmon nets and traps.

salmon-and-trout = the mouth (rhyming slang).

salmon-thirty-salmon = nickname of an Alaskan airlines 737 jet painted to look like a salmon. The U.S. Congress subsidised the Alaska Fisheries Marketing Board in 2003 with \$500,000 and the money was spent on painting the jet.

salmond-like = like a salmon in allusion to its instinct to return to its birthplace (Scottish dialect).

salmoneer = a commercial salmon fisherman (Newfoundland). See also salmonier.

salmonella = a not uncommon bacterium found in domestic aquaria, affecting humans. Symptoms include high fever, abdominal cramps and bloody diarrhoea and the patient usually recovers without treatment within a week. However, some infections stemming from a multidrug-resistant strain of *Salmonella paratyphi* B, can be much more serious, particularly to the elderly and small children.

salmonellosis = infection with *Salmonella*.

salmonier = a commercial salmon fisherman (Newfoundland). See also salmoneer.

salmonize = to make a river fit for salmon.

salmonry = the rights to the salmon fishery at a specified stretch of coast (Newfoundland).

salmonsews - salmon fry (obsolete).

salomon = salmon (3).

saluppe = slap.

salt = 1) a measure of the presence of salt on the surface of a commercially prepared fish. Ranges from slight (a fine powder) to moderate (fish colour obscured by salt) in fillets and in other applications from slight (fine salt not obscuring colour and transparency), through moderate, to high (crusted salt).

salt = 2) the application of salt to a split cod as a preservative.

salt absorbing cells = those cells in the gills which take in salt from the water.

salt bulk = 1) salmon, cod and related species salted in alternating layers of split fish and salt and arranged so the resulting fluid (pickle) can drain away. Also called round cure, round salted fish, bulk cure, kench cure, and bulk salted fish).

salt bulk = 2) to sell cod in its salted but undried condition.

salt burn = a condition arising when fine salt coagulates proteins near the surface of a fish being prepared and prevents any further penetration of salt into the flesh.

salt cart = a small wooden cart with two wheels and high sides, open at one end, used on fishing premises to move salt (Newfoundland).

salt cod = variously cured and split cod dried to various moisture contents.

salt concentration = percentage weight of salt in the water phase of a fish product. Percentage salt concentration is salt content divided by salt content plus water content multiplied by 100. Important in food safety as it protects smoked fish, which are not cooked before eating, from pathogens.

salt content = the weight of salt in a given weight of fish, e.g. g salt/100g fish in smoked fish; or given as a percentage. Not salt concentration.

salt creep = the accumulation of salt deposits on the side of the aquarium over time and through water evaporation.

salt crust = a method of preparing fish involving encasing the fish in salt before baking.

salt curing = fish preserved or cured with dry salt or in a brine, later dried or not, but immersed for a long time.

salt bulk = a quantity of split and washed cod, salted and placed in layers during the curing process (Newfoundland).

salt eel = a rope's end used in flogging, based on the use of an eel skin as a whip (obsolete).

salt fish = fish preserved by the addition of salt. See salt-fish.

salt fisherman = in Newfoundland, a vessel whose catch of cod is salted wet on board and taken to port to be dried.

salt fishing = 1) angling in salt or marine waters.

salt fishing = 2) commercial fishing where the catch is cleaned on deck and then packed in salt in the hold. See salter. Compare fresh fishing.

salt for Labrador = to apply salt liberally as in the preparation of Labrador fish (*q.v.*) (Newfoundland).

salt front = the limit up a river that a wedge of dense salt water penetrates from the sea.

salt lake = an enclosed body of water that has become salty through evaporation, usually fishless.

salt marsh = saltwater wetlands characterised by *Spartina* grasses or by halophytic vegetation and often nursery areas for fishes. Loss of marshes have great impacts on commercial fisheries. Usually dissected by a network of channels and having a productivity greater than agriculture and twenty times that of the open ocean.

salt pen = a wooden enclosure in which salt is stored on shore or on a vessel, the salt being used for curing fish (Newfoundland).

salt pound = salt pen.

salt round = to cure fish without any dressing.

salt round fish = whole ungutted fish cured with salt. Also called round cure, round salted fish, bulk cure, kench cure, salt bulk, bulk salted fish.

salt secreting cells = those cells in the gills which release salt to the water.

salt tolerance test = a test that measures the ability of salmonid smolts to transfer to salt water. A sample of smolts is exposed to salt water for a day and then their sodium or chloride ion concentration in blood plasma is measured and survival noted.

salt trip = a fishing voyage in which the catch is salted on board the ship (Newfoundland).

salt tub = a container for salt used to preserved fish such as cod.

salt wedge = a layer of higher salinity water moving along the bottom towards the head of an estuary.

salt-boiled fish = 1) cooking in brine before further processing such as canning.

salt-boiled fish = 2) cooking in salt until there is no free water left in the pot. Used in southeast Asia, the fish becomes covered in salt and, if effectively sealed, the product can be stored up to 9 months.

salt-fish = cod, split, salted and dried (Newfoundland).

saltation = the sudden appearance of an unexpected character, e.g. a mutation.

saltatrix swimming = prolonged locomotion alternating with short stops of juvenile fish having semi-opaque bodies making them inconspicuous to predators and prey. Food is taken during the short stop by a short directed strike, and area-restricted random search attempts to find more prey before prolonged locomotion resumes, e.g. Engraulidae, Clupeidae, Gadidae, Cyprinidae.

saltbank schooner = the vessel which took part in the cod fishery on the Grand Banks, having dories stacked on deck. The dories rowed out from the schooner to use longlines to catch the fish.

salted on board = fish salted or processed on board ship.

salted salmon = headed, gutted, split salmon or salmon fillets, cured in a mix of salt, sugar and spices for 2-3 days and then air dried for a week or so.

*saltem* = at least.

salter = 1) a crew member who adds salt when processing cod in the Newfoundland fisheries. The fish were heavily salted and laid in layers of fish alternating with layers of salt, the fish piled crosswise in kenches, q.v.

salter = 2) a sea-run or anadromous brook trout (*Salvelinus fontinalis*).

saltfish = cod and relatives or other fishes preserved by salting alone, e.g. about 460 lbs (208.8 kg) to 1000 lbs (454 kg) of split fish in a full butt or barrel.

saltfish-like = having the odour or flavour stimulus such as that associated with saltfish.

saltgrade = movement by leaps or hops.

salting = flavouring fish by rubbing in salt or by immersing the fish in brine for a short time before further processing such as smoking or canning. Also called dry salting or brining. cf. salt curing.

salting bin = a wooden crib in salt is stored or partially cured cod are stacked in salted layers (Newfoundland).

salting cask = a barrel-shaped wooden container for cured fish (Newfoundland).

salting stage = a building where split fish were salted in barrels before drying in Newfoundland. Used where stages, q.v., were liable to be adversely affected by bad weather.

salting store = salting stage.

saltwater fishing = sea fishing in Britain; fishing for sport in marine waters.

saltwater myxobacteriosis = an acute external bacterial disease of juvenile anadromous salmonids in the sea caused by *Sporocystophaga* usually occurring sporadically in early summer.

saltwater taper = a weight forward fly line similar to a bass bug taper, q.v.

Salzfischwaren = a product from salt cured fish, especially salted herring. Also may be in the form of fillets, bits or diced, with brine, acidified brine, edible oil, sauces, mayonnaise, spices and vegetables or other flavouring agents (Germany).

Salzling = salted herring without bones and heads but with tail (Germany). Also in brine. The end product may include 20% milt or roe.

samlet = a young salmon.

sampan = a flat-bottomed Chinese boat about 3.5-4.5 m long used in fishing. Can be moved by oars or by an outboard motor. May have a shelter and form a home on inland waters and coastal areas. Still common in Southeast Asia. The word is derived from the Cantonese for three (sam) and plank (pan).

sample = 1) in systematic ichthyology a collection of fishes made from a locality; a subset of a population; a representative part of a larger unit used to study the properties of the whole. The larger the sample the greater the confidence that the information derived from it truly reflects

the status of the whole although beyond a certain point more specimens do not yield significantly more data.

sample = 2) in fisheries a proportion of a stock removed for study, assumed to be representative of the whole. Larger samples give greater confidence that they reflect the status of a stock.

sample rod = a rod used to obtain a sample from barrel, e.g. of cod liver oil. Cod liver oil was graded according to colour, clarity and amount of dregs present. See also gauge rod and wantage rod.

sampling = the collecting of a sample; a general term used for field work.

sanal barrie = a small and oblong woven basket used for carrying sandeels as bait (Scottish dialect).

sanctuary = a place or time where/when fishing is not allowed to protect the stocks or species; for fish to spawn, rear young or rest.

sand = particles smaller than gravel but larger than silt, 0.0625-2.0 mm.

sand flat = sandy areas between reefs and rocks, apparently barren during the day but teeming with life at night.

sand spike = the North American term for the British rod rest, *q.v.*, a device inserted into the bank of a water body to hold a fishing rod.

sand spit = a narrow sand embankment created by an excess of deposition at its seaward end and terminating in open water.

sandbar = a ridge of sand or silt formed in rivers by water action.

Sandercyanin = a blue biliprotein secreted in the mucus of blue forms of the walleye, *Sander vitreus* (Percidae). The significance of the protein is unknown.

sandworm = a marine worm (Polychaeta) used as bait in angling, e.g. for striped bass. Also called blood worm.

sandy tidal flat = a tidal area without vegetation, mostly sand but some mud.

sanguivore = an organism feeding principally on blood.

sanguinicoliasis = an infestation with flukes of the genus *Sanguinicola*.

sanguinivorous = feeding on blood, e.g. certain pygiid catfishes such as *Vandellia*.

sanitary fish = herbivorous fish introduced into an aquaculture pond to limit growth of plants.

sanke = ornamental carp or koi (*q.v.*), being white fish with a red and black pattern.

SAO = a sloping, ventro-lateral row of photophores above the anal fin origin in Myctophidae.

sap (noun) = 1) a clump of worms strung on woollen yarn used as a bait in eel fishing. The eel's teeth catch in the yarn (English and Scottish dialect).

sap (verb) = 2) to fish with a sap.

saponin = a plant poison from members of the family Sapindaceae causing asphyxiation in fishes.

sapp = sap.

sapper = a boatload of cod (Newfoundland). See also sagger and swamper.

sappie = a diminutive for sap.

saprobic = pertaining to an environment rich in organic matter and low in oxygen.

saprolegniasis = a fungal infection from *Saprolegnia*, *Aphanomyces* and *Achlya*, usually a secondary infection after skin damage or scale loss but also affecting eggs in hatcheries. Appears as white to brown cottony or hairy patches on the skin, fins and gills. Death may occur if the gills are obstructed.

sapropel = the slimy, foetid, decayed bottom material in lakes. Rich in organic material and ferric sulphide formed from plant decay under saprobic conditions.

saprophagy = feeding on dead or decaying organisms. See also necrophagy, detritophagy and coprophagy.

saproplankton = plankton found on the surface of stagnant water, developing on decaying organic matter.

sarco- (prefix) = flesh or fleshy.

sarcophagy = feeding on flesh, carnivorous.

sardine = 1) a general term for fishes of the family Clupeidae which are canned, e.g. young *Clupea harengus* on the Atlantic coast of Canada, *Sardinops sagax* in California and *Sardina pilchardus* in England. English sardines are immature pilchards and the name was reserved for these fish only, by law. See also sprat.

sardine = 2) a sailor (American), as space on ships was limited (packed like sardines, *q.v.*).

sardine box = 1) a box in which sardines are packed.

sardine box = 2) an ornamental box to hold sardines for the table.

sardine key = a device to open a can of sardines, a slotted piece of metal that, when fixed to a flap on the can and rotated, peels off the lid.

Sardine Run = an immense spawning school of South African pilchard *Sardinops sagax*, 7 km long, 1.5 km wide and 30 m deep, off the east coast of South Africa from May to July.

sardine shears = scissors or shear used for opening a can of sardines.

sardine sorbet = a dish using sardines or herring fillets (or sardine broth and herring fillets), with cream, sour cream, shallots, chives, gelatine leaves and pepper, mixed and refrigerated.

sardine tongs = tongs used in serving sardines.

sardine-wise = like sardines in a box.

sardines in (a) the box = a game of hide-and-seek in which the seeker joins the hider on discovery, until only one seeker remains.

sark = the black membrane lining the body cavity of fish (Orkney dialect).

sashimi = thin slices of raw fish (often tuna), usually with soy sauce and green mustard; a Japanese delicacy eaten immediately after preparation. Also called tsukurimi.

satellite = a small male fish which mimics a female and attempts to sneak a spawning opportunity by darting in on an adult spawning pair, e.g. in *Lepomis gibbosus* (Centrarchidae).

satellite species = the condition found in Petromyzontidae where a non-parasitic species is believed to have evolved from most parasitic species, forming a series of species pairs.

Saturday's slap = a gap in a weir to allow fish to swim upriver to spawning grounds from Saturday night to Monday morning (Scottish dialect). Fishing at this time was illegal.

Saturday's sloope = Saturday's slap.

sauce = various fish species have been used in fish sauces, e.g. and q.v. cut lunch herring, fermented fish sauce, fish sauce, garum, ketchup, liquamen, milt sauce, moochim, muria, mustard herring, etc. Often used for an oriental spicy condiment or flavouring made from salted and fermented anchovies or other fish, including nam pla (Thai), nuoc nam (Vietnamese), patis (Philippines) and shottsuru (Japanese). These sauces are pungent and strong-flavoured.

sauced = a fifteenth century word for dressing tench (preparing this fish for consumption), no longer in use.

Sauer hering = a marinade made from gutted fresh or salted herring with bones and head. May also be headed (Germany).

Sauerlappen = block herring fillets cured in vinegar-acidified brine in barrels as a semi-preserve and used as raw material for making marinades and herring salads (Germany).

sauroid poisoning = scombrotoxicism.

saury and brandy = a Japanese flavour of ice cream, made with many others in response to a hot summer in 2004 (sauries are members of the family Scomberesocidae). See also shark fin and noodle and eel.

sausage = fish flesh, such as tuna, ground with fat, seasoning, spices and sometime a filler such as cereal and encased in a skin. May be cooked or smoked before or after encasing.

save = salting and drying cod to preserve it (Newfoundland).

save one's spring = showing a moderate profit at the end of the fishing season (Newfoundland).

save one's year = showing a moderate profit at the end of the fishing season (Newfoundland).

Savi's vesicle or ampullae = sensory organs in the form of closed sacs in Elasmobranchii associated with the lateral line and somewhat similar to the ampullae of Lorenzini, e.g. ventral surface of head of *Torpedo*.

saving trip = a moderately profitable fishing venture (Newfoundland).

saving voyage = saving trip.

sawtooth scale = a sharply pointed scale on the mid-belly of Clupeidae.

sc. = abbreviation for *scilicet*, meaning namely.

scaffold = 1) a raised platform on which nets are placed to dry, or are stored (Newfoundland). See also net horse, net gallows and shear.

scaffold = 2) a raised platform to store fish safely.

scag = 1) fish that become rotten through exposure to the sun (Scottish dialect).

scrag = 2) a small fish found in the stomach of a larger one (Scottish dialect).

scaine = a variant spelling of seine.

scalariform = ladder-shaped.

scalation = arrangement of scales, squamation.

scale = 1) a small, stiff, typically plate-like body in the skin of fishes, serving to protect, colour, and support the body. May be modified into spines, tubercles, bony plates, an exoskeleton, reduced or even lost. Phylogenetically absent in Amphioxii and Cyclostomata, and lost in various examples of the other groups, e.g. *Torpedo*, *Ictalurus*. The teleost scale is dermal in origin and consists of two major parts - the outer bony, hyalodentine or sclerite layer and the deeper fibrous section called the lamellar layer, fibrillary plate or basal plate. See placoid scale, ganoid scale, cycloid scale and ctenoid scale (latter two also called leptoid or elasmoid scales). Scales have a central focus or centre, an anterior or oral field, a posterior or aboral field (visible on the flank), and dorsal and ventral fields. See also annulus, circulus.

scale = 2) to remove scales from a fish. Usually done by scraping.

scale = 3) to shed scales.

scale = 4) calcium buildup or plaque in an aquarium.

scale = 5) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

scale = 6) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for ichthyologists (coined as a joke).

scale bone = the small superficial dermal bone lying between the epiotic and pterotic and covering the posttemporal bone. Also called tabular bones, extrascapulae, cervicals, nuchals, postparietals or supratemporals.

scale counts = see lateral line, longitudinal scale series, transverse rows, circumference, caudal peduncle, cheek, predorsal, etc.

scale eater = lepidophore (a scale-eating fish, specialised to tear off the scales of other fishes, e.g. the Lake Tanganyika cichlid *Perissodus microlepis*).

scale fish = 1) a term used in the U.S.A. for bottom-dwelling fish cured by salting and drying (other than cod and relatives).

scale fish = 2) a finfish or true fish as opposed to shellfish.

scale formula = scale counts are sometimes presented in the form of a formula. The number of scales above the lateral line is given above as the numerator, the number below the lateral line as the denominator under the line; before and after this fraction are given respectively the lowest and highest number of scales in the lateral line, e.g. 44 9-10/12-14 48, means 44 to 48 scales in the lateral line, 9-10 scales above the lateral line (not including the mid-dorsal scale) and 12-14 scales below the lateral line. Sometimes the count is given as L. transv. 9/14 which means 9 scales above and 14 below the lateral line. Sometimes also given as 9+70+11, meaning 9 above the lateral line, 70 in the lateral line, 11 below the lateral line.

scale picker = scale eater.

scale pocket = the skin fold in which a scale is situated.

scale protrusion = a disease found in aquarium fishes where the scales stick up and eventually fall off. Caused by a bacterial infection and treatable with antibiotics in the food.

scale reading = age determination by examining the annuli or growth rings on fish scales.

scale-eating = lepidophagy (scale-eating, several unrelated taxa are known to specialise in eating scales from other fishes using various methods, e.g. *Terapon jarbua* removes scales from *Mugil cephalus*. Scales and associated mucus and skin are not usually the exclusive diet of these species).

scale-fish = scalefish.

scale-less = lacking scales; use to avoid the confusion of scaled below.

scaled = 1) used in the sense of having scales, scaly; but could mean 2).

scaled = 2) past tense of scale, i.e. removing or lacking scales. Scaled seems to be (along with cleave) one of the few words in English that has two opposite meanings.

scalefish = fish bearing scales.

scaleless = lacking scales; usually in reference to species of fish that do not have scales such as catfishes but may refer to fish that have been scaled (2).

scalelet = subunit on the scale surface separated from others by radii.

scales = 1) an instrument for measuring the weight of a fish, e.g. small, hand-held spring loaded scales, not very accurate, digital scales.

scales = 2) money (American slang). See also shadscales.

scalimetry = age estimation using growth zones found on fish scales.

scaling = removing the scales but not the skin from a fish in food preparation.

scalloped = having a continuous but wavy border.

scalp = sculp.

scalpel marking = a retractable and sharp spine on the caudal peduncle of the aptly named surgeonfishes (Acanthuridae).

scaly = 1) having scales, covered with scales, being a scaly organism.

scaly = 2) shabby, mean (slang).

scaly fish = an honest, rough and blunt seaman.

scamel = a bench on which fish were cut up and offered for sale (Scottish dialect). Also spelled skemell and schamill.

Scandinavian housewife's disease = diphyllobothriasis (a parasitic, intestinal disease of humans caused by eating raw or lightly processed fish. The parasite is a tapeworm (*Diphyllobothrium*) and man is the definitive host, fish the intermediate host. Also called Jewish housewife's disease). The name arises from the tendency of preparers of fish balls to taste this dish before it was fully cooked.

Scania Market = a major fish market for herring held from 24 August to 9 October in the Middle Ages, so important that from about 1200 A.D. it made Scania a central point for other Western

European goods entering Scandinavia. The market was held between the two Scanian towns of Skanör and Falsterbo but the exact locality varied as the fishermen set up shop close to the area where the herring spawned.

scantach = scantack.

scantack = a fishing line with hooks and bait fixed in a river or along the sea shore; often used by poachers at night (Scottish dialect). Also spelled skantack, scantick and scantach.

scantick = scantack.

scapefish = the use of fish similar to that of a scapegoat, bearing the blame of evil or a sin of humans, e.g. in Assyria, fish were used symbolically to transport evil from the earth to subterranean waters.

scaphium = the second of the four Weberian ossicles, *q.v.*, named for its spoon shape.

scapula = the upper, paired endochondral bone on which the pterygials, actinosts or radials of the pectoral fin rest. It articulates ventrally with the coracoid and anteriorly with the cleithrum. A notch on the lower edge of the scapula matches a similar notch on the coracoid to frame the scapular foramen.

scapular arch = scapular girdle or pectoral girdle.

scapular area = the shoulder area behind the head.

scapular cartilage = a rod-shaped cartilage forming the lateral part of the coracoscapular bar in Elasmobranchii, articulating ventrally with the coracoid cartilage and dorsally with the suprascapular. The pectoral fin attaches laterally to its glenoid cavity.

scapular foramen = a notch on the lower edge of the scapula matching a similar notch on the coracoid to frame a foramen.

scapular girdle = pectoral girdle (the bony support of the pectoral fin behind the gills and usually attached to the posterior part of the skull; the "shoulder" girdle. Composed of the following basic elements (some of which may be lost): coracoid, scapula, pterygials, postcleithrum, cleithrum (main bone), supracleithrum and posttemporal. The "primary" pectoral girdle includes actinosts, scapula, coracoid, and sometimes mesocoracoid cartilage or endochondral bones and supports the fins directly. The "secondary" (and more primitive) pectoral girdle encloses the dermal post-temporal, supracleithrum, cleithrum, and two postcleithra, which are membrane bones and is only indirectly related to the fins. Also called shoulder girdle).

scapular thorn = large spines on each side of the anterior midline (shoulder region) of skates.

scapulo-coracoid = a region of the pectoral girdle skeleton in Actinopterygii.

scarce = the distance between two points in ripper-fishing (*q.v.*).

scaring line = frightening line (a line or chain with suspended leaves or fibres pulled by two or more men in order to frighten fish towards a trap).

scarified = cuts in the thicker parts of the muscle of a fish to allow penetration of salt.

scart = a poaching technique where hooks are dragged along the river bed (Scottish dialect).

scatter point = a position along a structure where fish begin to separate or scatter; often in shallow water close to a break line.

scatterer = an ecological group comprising reproductive guilds (*q.v.*) where eggs are scattered and develop pelagically, attached to submerged or emergent objects, or on the substrate. Most fishes simply scatter their eggs in high numbers. The eggs are nutrient poor, embryonic differentiation is delayed and there is a long larval period ending in metamorphosis.

Schaefer model = the basic form of production model in which the relation between yield and effort takes the form of a symmetric parabola.  $B_{MSY}$  (*q.v.*) is at one-half carrying capacity.

schamill = scamel.

*sched.* = *scheda*.

*scheda* = label; used for the label on a specimen. Abbreviated *sched.*

schematochrome = colour in a chromatophore produced by light reflections from a colourless surface and tissue refractions. Also called structural colours.

Schillerlocken = hot smoked strips from the belly wall of dogfish, *Squalus acanthias*, named for the poet's curly locks.

schizotaxon = one of two or more taxa formerly under one name but split into two or more taxa of the same rank.

schizotype = 1) a syntype regarded by a subsequent author as the type of a taxon but not specifically designated as the type for that taxon, i.e. an implied lectotype (*q.v.*).

schizotype = 2) a single specimen that is the type of two taxa.

schizotype = 3) a piece of a type.

Schmidt's index = the horizontal distance between the anus and the dorsal fin origin as a percentage of total length. Used as a measure of fin length and position in eels.

schnabel length = German for bill or beak. Schnabel length in ichthyology is the length of the pointed projection or beak on the chin of some *Sebastes*.

Schnabel method = a mark-recapture method for estimating population size of a closed population. Individuals are marked and released, more are caught and marked with the same mark and released, the catches of marked and unmarked fish being counted.

Schnauzenorgan = a German word for the chin protuberance or chin appendix of elephant nose fishes (Mormyridae), where there is the highest density of electrical receptors.

Schoener Index = a measure of dietary similarity on a scale from 0 (no overlap, completely different) to 1 (identical diet).

scholl = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

school = 1) a group of fishes, usually constituted of the same species, which tends to orient and move in the same direction. There are obligate and facultative schoolers. The latter can only be forced to stop schooling momentarily by considerable violence and will not maintain a state of random orientation. See aggregation and shoal.

school = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for butterflyfish.

school = 3) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for salmon.

school = 4) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for sharks.

school = 5) scull (1).

School of Fish = an alternative rock band from Los Angeles formed in 1989 and disbanded 5 years later. The main members were Josh Clayton-Felt and Michael Ward.

schoolfish = a fish species that forms schools.

schoolie = a fish, especially a young fish, that swims in a school.

schooling = acting as a school.

schooling up = a grouping of a large number of fish near the surface.

Schreckreaktion = the alarm response to alarm substance (Schreckstoff).

Schreckstoff = alarm substance (a substance produced in the round or oval alarm substance cells (previously called "clubcells") in the skin of Ostariophysi (Cypriniformes, Siluriformes) and Gonorynchiformes, and which is released upon injury of the skin. On smelling the alarm substance members of the same species, and to a lesser extent related fishes, exhibit the fright reaction (q.v.). The dispersal of the alarm substance apparently normally acts to warn of the presence of a preying predator. The alarm pheromone is hypoxanthine-3N-oxide comprising a purine skeleton with N-O functional group and sensitive to relatively weak changes in pH. Also called alarm pheromone).

schrod = scrod.

scientific cruise = a voyage by a vessel for scientific purposes.

scientific fishery survey = studies from a vessel aimed at increasing scientific knowledge of the fishery. Usually exempt from fishing regulations. As it uses standard gear, it is not affected by the commercial need to change gear in response to economic needs, thus giving a clearer picture of abundance.

scientific name = the Latin or latinized name of a taxon as opposed to its popular or vernacular name. Consists of two words, the genus name and the species or trivial name, e.g. *Squalus acanthias*, the spiny dogfish. Convention demands that this name be underlined, italicised, in bold face or in some other fashion distinguished from the rest of the printed text. See also name.

scientific research vessel = a vessel owned or chartered by, and controlled by, a foreign government agency, a national government agency, a university, an international treaty organization, or a scientific institution. The vessel must have scientific research as its exclusive mission during the scientific cruise in question and its operations must be conducted in accordance with a scientific research plan.

*scilicet* = namely. Abbreviated as *sc.*

scintillon = a chemically active membrane bound particle in *Gonyaulax* which reacts with molecular oxygen to produce living light or bioluminescence.

sclera = the opaque protective outer coat of the back of the eye. Supported by sclerotic bones or scleral cartilage.

scleral cartilage = circular cartilage ringing the posterior portion of the eye in the sclera. Supports the eye.

scleral ossification = bones lying in and supporting the sclera of the eye. There are commonly two in Perciformes but there is only one in Callionymidae and some Gobioidei (other gobioids have only a circular ribbon of scleral cartilage).

sclerite = bony upper layer lying on the fibrillary plate of a teleost scale.

scleroblast = osteoblast (a cell which deposits calcium salts and forms bone, the precursor cell of an osteocyte. Osteoblasts migrate to centres of bone formation during early development).

sclerochronology = the study of calcified structures (otoliths, scales, skeleton) to reconstruct the past history of an organism.

sclerotic bone = one of a series of bones in the sclera of the eye, e.g. in *Salmo* there are anterior and posterior sclerotic bones, in *Gasterosteus* dorsal and posterior, and in *Xiphias* the entire sclera ossifies with two openings, one for the cornea and one for the optic nerve.

sclerotic coat = sclera.

sclerotome = the block of mesenchyme tissue destined to become a vertebral centra, the posterior and anterior halves of two adjacent sclerotomes fusing to form the centra (rarely each forms a centra as is the case naturally in *Amia*, or teratologically in other forms).

sclope = slap.

scoliosis = a lateral curvature of the fish vertebral column, often caused through malnutrition.

scombrotoxic fishes = those fishes causing scombroid fish poisoning - certain species of Scombridae, Scomberesocidae, and possibly other dark-meated marine species.

scombrotoxin = the poison in scombrotoxic fishes, believed to consist of histamine, saurine and possibly other toxic by-products resulting from bacterial action on histidine, a normal muscle constituent of dark-meat fishes.

scombrotoxism = a form of fish poisoning resulting from consumption of scombrotoxic fishes. Certain bacteria in improperly preserved fish act on the histidine in the dark meat of the fish, converting it to saurine and histamine. The ingestion of the latter causes an allergy-like reaction. Toxic scombroid flesh has a sharp or peppery taste. Symptoms, which usually develop a few minutes after ingestion, include headache, epigastric and abdominal pain, burning of the throat, cardiac palpitation, thirst, vomiting and diarrhoea. A general erythema and, in severe cases, respiratory distress may develop. Acute symptoms usually last 10-12 hours, death is rare. In the event of poisoning, the stomach should be evacuated and epinephrine administered. Brotoxin, eperephrin, cortisone, and intravenous bendryl may be employed.

scoo = a flat scoop-shaped basket used by fishermen to hold their lines after they have been baited or into which herrings are put when being gutted (Scottish dialect).

scoop = scoop net.

scoop basket = a basket made of wicker, plaited material, clothing and even spider webs in the shape of a scoop or shovel used to catch small fishes.

scoop net = dip-net (a bag-shaped net held open by a square or rounded frame on the end of a long pole. Used to scoop fish from the water, either on small scale in streams or ponds or commercially from large catches).

scoop seine = a small purse seine used to extract fish from a large enclosure that lacks any concentrating nets to ease capture of the fish.

scooping gear = a net kept under water for some time and then rapidly raised to capture any fish swimming or resting over it.

scooptotype = a joke term in nomenclature for a type described by an author before a competitor could.

scope = a fish scope is the cathode ray tube element of a fish finder.

scoring = making cuts through the fish skin to allow faster penetration of salt before smoking or to allow softening of small flesh bones when frying.

Scotch barrel = a wooden container for export of herring processed as Scotch cured.

Scotch cured herring = unwashed, fresh herring that has been gibbed, roused and packed tightly in barrels and mild cured in their own blood pickle. This form of processed herring has a limited shelf life.

Scotch pack = Scotch cured herring.

scotophilia = darkness loving; fish that move away from light, such as some cave fishes.

Scottish seine = a seine set from a free-floating marker buoy. When the free end is returned to the buoy, both ends are lifted onto the vessel and dragging and hauling begins as the vessel moves forward. This process is called fly dragging.

scour = the process of plant and sediment removal by water action, as in floods.

scouting = a vessel searching for fishes by visual, acoustic or other means that does not involve catching of fish.

scow = scoo.

scrae = fish preserved by being dried in the sun (Scottish dialect). Also spelled skrae, skrea and scray.

scran = left over fish or fish caught accidentally with the target species, eaten by the crew of a boat (Scottish dialect).

scanner = a fishing boat that poaches within the three-mile limit (Scottish dialect).

scrap = fish waste.

scrap fish = non-commercial fish, those not used for human consumption.

scraper = fishes scraping food from rocks or plants, e.g. *Chondrostoma nasus*.

scraper trawl = a trawl net designed to maximise groundfish catches by increasing area swept, i.e. they have very long wings and do not require a high headline.

scraping net = a large bag or skimming net held from a boat against the current or on a beach for short intervals. Sometimes operated with counter-weights to lift it out of the water.

scratcher = a trawler that fishes as close as possible to the three-mile limit and so is able to land catches more frequently (Scottish dialect).

scratcher disease = a infestation of the intestinal canal caused by worms (Acanthocephala) which dig into the canal wall causing inflammation, perforation, anaemia and weakness. Can be fatal to smaller fishes.

scray = scrae.

screamer = a hard fighting fish since it makes the reel "scream".

screen = a fish screen lies across a body of water or structure, e.g. the turbine intake of a dam, designed to divert the fish into a bypass system.

screenge = to fish the sea bottom inshore with a small seine (Scottish dialect).

screenge net = a small seine used inshore (Scottish dialect).

screenger = one who fishes with a screenge net (Scottish dialect). Also spelled scringer.

screw = to press dried cod tightly into a cask or drum for export (Newfoundland).

screw trap = a trap consisting of a cone through which fish, such as lampreys enter the trap, the cone has a cork-screw fin in it that turns the cone when water hits it, and as the cone spins, all the fish are funneled into a live box. The live box has a perforated debris drum at the back to remove floating debris.

screw-cap vial = a vial with a threaded plastic cap, often used to store parts of a dissected specimen or very small specimens that would be lost in a large jar.

screwed fish = dried cod pressed tightly into a cask or drum for export (Newfoundland).

screwing room = an area in a merchant's premises in which cod are pressed in casks for export (Newfoundland).

scringer = screenger.

scrod = 1) a New England term for a young cod, haddock or pollock split and boned for cooking as the catch of the day. Usually the smallest market size fish. Also spelled schrod (from the Middle Dutch schrode).

scrod = 2) past pluperfect of screw.

scrogag = a half-dried fish (Scottish dialect). Also spelled scroggan.

scroggan = scrogag.

scroll intestinal valve = an intestinal valve where the valve is very long and rather like a scroll of paper inserted along the length of the intestine.

scrubber = a small bundle of twigs, usually heather, used for scrubbing the insides of a split fish in Scotland.

scruff = an inferior grade of fish (Newfoundland).

scrunch(e)o(ns) = scrunchins.

scrunchings = scrunchins.

scrunchins = pieces of fish liver after the oil has been removed (Newfoundland). Also spelled cruncheons, scrunch(e)o(ns), scrunchings or scrunchions.

scrunchions = scrunchins.

scull = 1) the annual migration of capelin (*Mallotus villosus*) to spawn on beaches with associated feeding on this concentration by Atlantic cod and seabirds. Also spelled school and skull.

scull = 2) any fish migration.

scull = 3) a boat oar.

scull = 4) to propel a boat with one oar worked from side to side over the stern.

scull = 5) a shallow, scoop-shaped basket, deep at one end for the fishing line and shallow at the other for the baited hooks. Also used to carry fish. See also setting of the sculls.

sculp (noun) = 1) the fleshy part of a cod's head, cut off and eaten as a delicacy (Newfoundland).

sculp (verb) = 2) to cut off the fleshy part of a cod's head (Newfoundland).

sculpin = 1) a member of the family Cottidae.

sculpin = 2) a mean or mischief-making person (New England slang).

sculpted = sculptured.

sculptured = having ornamentation, surface shapes or textures.

scum = 1) a surface layer of algae. Also called mat.

scum = 2) an outsize angling net used to scoop salmon out of pockets in fly nets (q.v.) (Scottish dialect).

scum net = 1) an additional net used to scoop up fish that fall out of drift net as it is being hauled in.

scum net = 2) a scoop net used for catching salmon in rivers.

scumming net = scum net.

scun = 1) to keep a lookout for fish (Newfoundland).

scun = 2) to fasten parts of a fish net together or to repair a net, often temporarily (Newfoundland).

scuta = plural of scutum.

scuttle dan leno = a lighter version of the dan leno bobbin, *q.v.*, a hemisphere.

scutum (plural scuta) = scute.

scutatus stage = pelagic juvenile Antennariidae characterised by bony plates extending posteriorly from the cranium beyond the level of the operculum bones and with an expansion of the anterior margins of the bones of the suspensorium.

scute = an external shield-like plate or scale, usually with a keel or spiny point e.g. bony plates along the body of Acipenseridae, sharp-edged midventral scales of Clupeidae.

se koke disease = a wasting disease of fish fed on silk worm larvae.

sea = 1) a large body of salt water, smaller than an ocean, more or less landlocked and part of or connected with an ocean or larger sea.

sea = 2) waves caused by wind and the state of the ocean or lake in regard to waves.

sea anchor = the American term for the British word drogue, namely a drag, usually a canvas-covered conical frame, floating behind a vessel to prevent drifting or to maintain a heading into the wind.

sea cage = a floating enclosure of wire or netting used to hold and rear fish in the sea or open water.

sea cubbie = a woven straw fish basket (Orkney dialect).

sea dog = the old English name for sharks. Shark was introduced in 1569 by John Hawkins' sailors who exhibited one in London. Based on Caribbean usage for large sharks and is probably from the Yucatec Maya word for shark, *xook*, pronounced [ʃo : k].

sea farming = mariculture (marine cultivation or aquaculture of organisms in tanks, pens, ponds or cages or net enclosed areas in the open sea).

sea fishing = saltwater fishing in American English.

sea food = any marine organism used as food including fishes, shellfishes, seaweeds, etc.

sea frozen fish = fishes frozen on board a vessel.

sea grass = eelgrass (a submerged aquatic plant with very long and narrow leaves, often a habitat for fishes).

sea horse soup = a Cantonese medicinal soup made with dried seahorses. Supposedly sea horses are good for the skin, lungs and cleansing the kidneys in traditional Chinese medicine.

sea ice = pack ice (floating ice that has been driven together into a single mass).

sea ivory = the scutes of sturgeons (*Acipenseridae*) made into jewelry in North America.

sea kitten = a name for fish used by PETA (People for the Ethical Treatment of Animals), in a youth-focused campaign in an attempt to make fish more endearing to people who would eat them, to stop angling, encourage conservation, address overfishing, etc.

sea leopard = ornamental leather made from the skin of wolffishes (*Anarhichadidae*).

sea level rise = the long-term trend in mean sea level.

sea mile = nautical mile, or one minute of arc of a great circle (1,842 metres at the equator and 1,861 m at the pole).

Sea Monkeys = brine shrimp (*Artemia nauplii*) are used as food for fry in aquaria and, to a limited extent, adult brine shrimp may be fed to larger fish. They are not very nutritious and should not be used as the sole food. The nauplii are hatched from purchased cysts in warm, aerated, saline water and must be rinsed to remove salt before feeding to fry. Sold as "Sea Monkeys" in comics.

sea purse = mermaid's purse (an egg-case of an Elasmobranchii, usually oblong with horns or tendrils).

sea puss = a strong and dangerous longshore current or rip current caused by return flow.

sea ranching = release of fish into the sea that are then re-captured on their migratory return, e.g. salmon smolts harvested as adults 2-5 years after release. Recapture rates are usually less than 5% but may be as high as 20%.

sea run = said of fishes that enter the ocean, usually for feeding.

sea serpent = a huge, elongate, mythical, marine animal. Various fish species of large size and form unfamiliar to the layman have been mistaken for sea serpents. Also the decayed remains of basking sharks that have their massive gill arches washed away can resemble popular ideas of a serpent.

sea stick = old term for herring salted in barrels at sea and later repacked on shore (United Kingdom).

sea taboo name = a special vocabulary used at sea, presumably to prevent bad luck and ensure a good catch.

sea time = logged time spent at sea; may be used to measure effort in scientific collecting.

sea water = the water in the oceans having a mixture of dissolved salts and a salinity of 30-35 p.p.t.

sea-gypsy = a Malayan fisherman (and family) who spend all their lives at sea.

sea-ledger = ledger tackle (*q.v.*) used for fishing in the sea.

sea-net = a net used for fishing in the sea.

sea-packed = fish packed at sea to be sold on arrival in a port.

sea-runner = an anadromous fish.

sea-trap = a trap used for catching in the sea.

seafood = food for humans comprised of organisms from the sea including fishes. May be restricted by regulation to exclude aquaculture products. Often excludes mammals and birds.

seafood birdsnest = the crunchy nest is made of dried taro and can have a fish fillet filling (as well as scallops, celery, mushrooms, shrimps and calamari).

Seafood Watch = a listing of sea foods giving best choices, good alternatives and sea foods to avoid. The latter includes fish that are caught or farmed in ways that harm the environment and include sharks, sturgeons, tunas, farmed salmon, orange roughys, etc. (see [www.seafoodwatch.org](http://www.seafoodwatch.org)).

seahorse = 1) a member of the family Syngnathidae which also includes pipefishes. These fishes are characterised by a body enclosed in bony rings, and seahorses have an erect body posture, a prehensile tail, a long snout and the males have a pouch in which they brood the young. Often displayed in aquaria and sold dried as curios.

seahorse = 2) a large, white crested wave.

seahorse soup = sea horse soup.

seal-head cod = cod with a deformed head (Newfoundland). See also bulldog cod.

seam = a calm spot in a river caused by a log or other obstruction.

seamount = 1) an undersea mountain; usually of volcanic origin and with high endemism.

seamount = 2) the shore of the sea.

sean(e) = a seine used at sea. Also called seyne.

search time = the time a fishing vessel spends looking for fish schools. In purse seining, search time may be time at sea minus duration of the set.

season = the time of year when certain fishes are caught with specific gear.

seasonal closure = a closed season when fishing is banned in an area or for an entire fishery for a specified time to protect stocks, juveniles or spawners.

seasonal fishing mortality rate = conditional fishing mortality rate (the fraction of an initial stock which would be caught during the year (or season) if no other causes of mortality operated (Ricker, 1975). Also called annual mortality rate. Abbreviated as m).

seasonal growth rate = the number of fish which die during a season, divided by the initial number (Ricker, 1975).

seasonal total mortality rate = the number of fish which die during a season from causes other than fishing divided by the initial number (Ricker, 1975). Also called annual mortality rate, annual natural mortality rate, conditional natural mortality rate, seasonal natural mortality rate.

seasonal type = a locality type, an unofficial term in nomenclature for absurd or unusual names for types.

seastick = herring salted at sea immediately after being caught (Newfoundland).

seat = a place where fishermen fish with hand lines (Shetland Isles dialect). Also called hand line seat.

seat box = a specially designed box used in match fishing in Europe or in any static fishing where the angler sits for long periods at the same spot. The box contains drawers and compartments for holding rigs and tackle.

seawall = a structure built to prevent erosion by wave action.

*sec.* = abbreviation for *secundum*, meaning according to.

Secchi depth = a measure of transparency; see Secchi disc.

Secchi disc = a 20-30 cm diameter disc marked in 2 black and 2 white opposing quadrants, lowered into the water. The average of the depth at which it disappears from sight and the depth at which it reappears when lowered and raised in the water column is the Secchi disc reading or Secchi depth, a measure of transparency.

Secchi disc reading = a measure of transparency; see Secchi disc.

second = one in command of a fishing vessel under the captain.

second boat = the boat which neither shoots nor hauls the net in pair trawling.

second fry pond = second fry rearing pond.

second fry rearing pond = fingerling pond (a rearing pond stocked with fry for their first year of growth).

second hand = second.

second suborbital = third infraorbital in Characidae.

second-level consumer = a fish that feeds on other animals that themselves feed on plants. Also called middle-level consumer.

secondarily anaulacorhizid = a condition of the chondrichthyan tooth where the median groove of a holaulacorhizid type of root is totally overgrown to form a closed tube internally connected or merged with the pulp cavity (Herman *et al.*, 1994).

secondary bone = bony tissue deposited in an area where the bone has been reabsorbed.

secondary contact = the zone where the ranges of two taxa now overlap or abut following their geographical isolation and differentiation from a common ancestor.

secondary freshwater fishes = those fish rather strictly confined to fresh water but evidently capable of occasionally crossing narrow sea barriers; tolerance of sea water for short periods is known for many species, e.g. Lepisosteidae, most Poeciliidae, most Cichlidae, Synbranchidae.

secondary homonym = the two or more species-group names applied to different taxa of the group and included in the same nominal genus as the result of the transfer of one or more of the species-group taxa from another genus.

secondary host = intermediate host (a fish in which a parasite passes a larval or non-reproductive phase).

secondary lamella = lamella (plural lamellae) (a layer, a thin plate, e.g. the plates in the sucking disc on the head of Echeneidae; in gills the transverse vertical plate on the gill filaments through which capillaries run).

secondary male = a male fish produced by regression of the ovaries and proliferation of testicular material, e.g. in *Rivulus marmoratus* (Cyprinodontidae). See hermaphrodisim and primary male.

secondary osteon = an erosional cavity formed from a vascular canal secondarily filled with concentric bone layers.

secondary radius = a radius on a scale that does not reach the focus or extends only part way between focus and margin of the scale.

secondary scale = one of a series of small scales on the exposed surface of main scales, e.g. in some Mugilidae.

secondary sex characteristic = any characters that identify or separate the sexes other than ovaries and testes (the primary sex characteristics). These characters may be colour or some anatomical feature.

secondary structure = zones that do not agree with the opaque and translucent zones of an annulus in ageing fish. These secondary structures are false and split or double rings or zones.

secondary type = a referred, measured or figured specimen, not a primary type. A specimen used to add to or correct data on a species.

seconds = fish not meeting the requirements of number one grade in commercial sales.

secretocyte = a highly specialised cell in the skin of the discus fish that secretes nutrients for the young.

secretory granulocyte = a type of blood cell of unknown function found in *Ictiobus cyprinellus* and *Ictiobus niger* (Catostomidae).

secular = pertaining to the passage of time.

*secundum* = according to. Abbreviated as *sec.*

sed = sud.

*sed. mut.* = *sedis mutabilis*.

sedek = seddick.

seddick = a fishing ground (Scottish dialect). Also spelled saedick and sedek.

sedentary = 1) fish which do not move far, e.g. less than 1.6 km from a release point.

sedentary = 2) the Newfoundland fishery carried out by fishermen from nearby harbours, not migratory fishermen.

*sedis incertae* = *incertae sedis* (of uncertain seat, meaning of uncertain taxonomic position or affinities).

*sedis mutabilis* = used to indicate a changed taxonomic placement. Abbreviated *sed. mut.*

seed = fertilised eggs, fry or fingerlings used for growing in aquaculture facility or for stocking grow-out areas.

seed haddock = very small haddock (Scotland).

seepage lake = a lake without a significant inlet or outlet, fed by rainfall and groundwater. The water has a long residence time. Often susceptible to acid rain where there is little groundwater flow.

segmental artery = the artery leading from the dorsal aorta or caudal artery to the spinal cord.

segmental plate = an unsegmented field of paraxial mesoderm found posterior to the somite file, from which somites will form.

segmental vein = a vein leading from the spinal cord to the caudal vein, axial vein or posterior cardinal vein.

segmentation = a repetition of elements, particularly along the anterior-posterior axis. Used to define the period of embryonic development between the gastrula and pharyngula.

segmented = divided, particulate; used to describe egg yolk in larval fishes as opposed to homogenous.

segmented ray = a fin ray divided into segments along its length.

segregate = a part of a taxon that is split into two or more parts.

seiche = a periodic oscillation or stationary wave of the water in a lake usually caused by strong winds or barometric pressure changes; stratified layers may be mixed and shoreline habitats flooded or exposed. Small inflowing streams can flow backwards, disconcertingly.

seine = 1) a net shaped like a curtain used to encircle fishes, usually weighted at the bottom and with floats at the top, and often with a bag in the centre. May be operated from shore, or from a boat (Danish or Scottish seines).

seine = 2) a kind of net for effecting an involuntary change of environment. For fish it is made strong and coarse, but women are more easily taken with a singularly delicate fabric weighted with small, cut stones (from "The Devil's Dictionary" by Ambrose Bierce).

seine ball = a lead sinker attached to the foot of a seine to keep the lower edge near the bottom and the net stretched.

seine barrow = a flat and rectangular wooden frame with handles at each end for two men to carry a cod seine.

seine boat = the boat that was operated from a schooner catching mackerel with a purse seine, q.v.

seine gallows = a wooden frame on which a seine is placed to dry.

seine lead = seine ball.

seine linnet = netting which forms a seine.

seine man = a man engaged in fishing with a seine, especially for bait to supply banking vessel in Newfoundland.

seine master = a man in charge of a boat and crew fishing with seines. Also called master of the seine.

seine rope = one of the two long ropes used to haul in a seine.

seine skiff = a large open boat, propelled by oars, used to fish with seines.

seine tar = a form of tar used to tan nets.

seine vessel = the largest vessel used to operate a seine.

seining = using a seine.

seismosenory = pertaining to lateral line sense organs.

sekoke = a disease of *Cyprinus carpio* fed on silk worm pupae resulting in muscle wasting, loss of appetite, poor growth and death.

selachine = a neurohumor causing paling. Found in *Mustelus*.

selachophobia = fear of sharks, a medical term where the sufferer feels anxiety even when viewing a shark in an aquarium or other safe environment. Also called galeophobia.

selection = 1) in taxonomy at one period used nomenclaturally for subsequent designation of a type.

selection = 2) process favouring one feature of an organisms in a population over other features through differential reproduction (organisms with favoured features produce more young and are more numerous in subsequent generations).

selection = 3) selectivity.

selective breeding = the intentional selection of individual spawners in artificial production programmes to produce particular traits in subsequent generations.

selective feeder = a fish that chooses a given type of food from several that are available in the environment.

selective feeding = choosing a given type of food for feeding in aquaculture.

selective fishery = a fishery that allows the unharmed release of non-target fish stocks/runs.

selective gear = a gear allowing fishers to capture few (if any) species other than the target species.

selective harvest = where an angler keeps some of the catch as food but releases others alive for future sport.

selective trawl = a trawl designed to catch certain smaller species or fish sizes thereby facilitating a pre-sorting of the catch and protecting species or stocks.

selectivity = the ability of gear to catch a certain kind (species selectivity) or size (size selectivity) of fish compared to its ability to catch other kinds. May allow young and non-target species to escape.

selectivity curve = escapement curve (the relationship between size (or age) and the probability of a fish escaping from the gear after having encountered it, e.g. swimming through the mesh of a net, the sorting grid of a trawl, or the escape gate of a trap).

self depth adjusting waggler = a float used in angling that automatically sets itself to the correct depth. It has a two point friction device at the float bottom where the line passes through. When cast out with a slack line the float will rise to the surface, the line can then be tightened until only the desired float tip is showing, and the float will lock as long as the line is tight. Also called ledger float.

self-cocking float = a float used in angling with a weighted base, cocking the float immediately and allowing the unweighted line to sink slowly.

self-feeder = a mechanism that dispenses food when a fish activates it. Also called pendulum feeder or demand feeder.

self-sustaining population = a population of fish that exists in sufficient numbers in a natural ecosystem to maintain its levels through time without human interference such as supplementation with hatchery fish.

sella turcica = a cavity in the basisphenoid where the adenohypophysis is found.

sellak = sellok.

selloc = sellok.

sellok = a newly hatched fry or the young of fish, especially herring (Scottish dialect).

semaphoront = 1) the organism at developmental stages, e.g. egg, larva, young, adult.

semaphoront = 2) a character bearing state of an organism in cladistics.

semelparous = organisms having only one brood per lifetime, the adult dying after spawning, e.g. Pacific salmons.

semestrial - referring to a period of six months.

semi- (prefix) = half, partly.

semi-anadromous = incomplete migration between fresh and salt water. The fish spawns and overwinters in fresh waters but feeds in large, brackish estuarine areas, the plumes of fresh water mixed with saline sea water that are rich in nutrients and important foraging areas. Such populations are known as winter races and often grow faster, mature at larger sizes, spawn earlier in spring and move further upstream than non-migratory stocks (spring races).

semi-boneless cod = a superior grade of salted cod from which bones and skin have been removed but some smaller bones are left behind.

semi-diadromous = living in brackish water near river mouths and only entering fresh water to spawn.

semi-diurnal = having a period or cycle of approximately one-half of a tidal day (12.4 hours). See semidiurnal tide.

semi-dry = a grade of cod involving a quick drying operation.

semi-dry ration = in aquaculture, a diet formed from a dry product and ground meat.

semi-enclosed = used of a water body mostly surrounded by land, e.g. the Baltic Sea.

semi-intensive culture = aquaculture where only part of the life cycle of the fish is under controlled conditions. Generally the early stages are controlled and then the fish is released for ongrowing.

semi-lunar valve = elasmobranchs have semi-lunar valves in the conus arteriosus of the heart, *q.v.*

semi-preserves = fish or fish products that have been stabilised by various methods for a limited period of shelf life (1-2 months usually).

semi-submersible submarine = a submarine carrying passengers, usually tourists, who can view fishes and other undersea life through windows while the skipper drives the submarine from a wheelhouse above water level.

semibottom trawl = a trawl fished just above the bottom of the sea bed.

semibuoyant = said of eggs that neither sink nor float but remain suspended in the water column.

semicircular ear canal = fluid-filled canals embedded in the cranium and concerned with balance and hearing. Gnathostomata have 3 canals, lampreys have 2 (lacking a horizontal canal), and hagfishes have only one canal, perhaps appearing secondarily by the joining of two canals. Fossil Cyclostomata may have had 7 or more semicircular canals. Each canal and otolith camera has an inner area (the macula or spot) covered with a receptor epithelium.

semidemersal = semipelagic.

semidiurnal tide = a tide with two high and two low waters in a tidal day with comparatively little diurnal tide inequality. The commonest type of tide.

semidrift gill net = a gill net with one end anchored and the other allowed to drift.

seminal receptacle = the blind sac between the anus and excretory pore behind whose opening is a ridge of skin with the shape of an anteriorly opened triangle followed by a tongue-shaped posteriorly directed appendage, the caudal pad.

seminal vesicle = the enlarged lower end of the genital duct which is secretory in nature and completes the formation of the spermatophores and stores them. The so-called "seminal vesicles" of teleosts (Blennioidea, Gobioidea) are misnamed and do not store sperm; their function is uncertain. Siluriformes have seminal vesicles.

semilunate = shaped like a half-moon.

semipelagic = said of fish that spend part of their life on the bottom and part in the water column above.

semipelagic trawl = a trawl fished off the bottom.

semispecies = a component species of a superspecies, incipient species; isolated populations of uncertain rank.

senescent fishery = a fishery showing significant declines for a number of years, usually through overfishing.

senescent period = old age, a time when fish growth is extremely slow, arrested or negative and gametes are inferior or not produced. This period can last several years, e.g. in Acipenseridae, or several days, e.g. *Oncorhynchus*.

senior homonym = the earlier published of two homonyms.

senior synonym = the synonym with the earlier publication date.

*sens.* = abbreviation for *sensu*, meaning in the sense of.

*sens. ampl.* = *sensu amplificato* (in an enlarged sense).

*sens. lat.* = *sensu lato*.

*sens. str.* = *sensu stricto*.

sensory canal bone = canal bone (one of the series of bones of dermal origin that enclose the neuromasts and seismosensory canals. May be formed from one or more ossification centres).

sensory canal = lateral line (a tube-like sensory organ (usually bearing pores) extending along the side of the body. Detects water movements, low frequency vibrations and perhaps temperature changes. In some fishes the sensory organs are uncovered (without a tube or pores). The lateral line is innervated by the vagus or Xth cranial nerve. The similar sensory system on the head, often called the cephalic sensory canals, is differently innervated. Lateral lines may be single, multiple, complete (extend to the base of the caudal fin) or incomplete, have accessory branches, be decurved, recurved, arched. etc.).

*sensu* = in the sense of. Used in nomenclature in front of the name of the author misapplying a name. Abbreviated as *sens.*

*sensu amplificato* = in an enlarged sense. Abbreviated as *sens. ampl.* or *s. ampl.*

*sensu amplio* = *sensu lato*.

*sensu lato* = in the broad sense; using a taxon inclusively to embrace two or more taxa which other authors consider distinct. Abbreviated as *sens. lat.*, *s. lat.* or *s. l.*

*sensu stricto* = in the strict sense, in the narrow sense; using a taxon restrictively, excluding taxa which other authors include. Abbreviated as *sens. str.*, *s. str.* or *s. s.*

**sentinel fishery** = monitoring a threatened stock through time by a scientific fishery, often with commercial fishermen who can sell the catch.

**sentry effect** = an awareness of predators increased by the presence of many fish in a school.

**separability** = the assumption, made in some age-structured stock assessment models, used to track changes in fishing mortality by fish age and by fishing year, that the fishing mortality matrix can be partitioned into two components: These are an age-specific component that does not vary over time, i.e. a constant exploitation pattern, and an annual multiplier that scales the age-specific pattern up or down.

*separata* = plural of *separatum*.

**separate** = *separatum*.

**separation** = *separatum*.

**separator panel** = sieve netting.

**separator trawl** = a trawl that catches fish in separate sections of the net based on behavioural differences, e.g. cod and plaice would be caught in a lower section while haddock would be taken in an upper section. The meshes of the two compartments can be different and adjusted to catch the size of adult fish required.

**separatum** (plural *separata*) = a reprint (a printed copy of an article in a serial publication or in a separate work, intended for distribution subsequent to the publication of the work that contains it; the text is identical with the original, but there may be changes in headings, pagination, or page arrangement). The advance distribution of separates after 1999 does not constitute publication for purposes of zoological nomenclature.

**septal bone** = an unpaired median ossification of the interorbital septum embracing posteriorly with two thin flanges the ethmoid cartilage, and which touches dorsally the frontal and posteriorly the basisphenoid. Found in Pholidichthyidae.

**septomaxilla** = pre-ethmoid (one of the paired deep bones lying above the vomer in *Amia* and *Esox*. Similar bones occur in Catostomidae and Cyprinidae. Formerly called septomaxilla but not homologous with that bone in tetrapods).

**septum** = a thin partition.

septum papillaris = a division of the pupil or eye. In *Osteoglossum* the septum is horizontal permitting simultaneous vision over and beneath the water surface.

*seq.* = abbreviation for *sequens*.

*sequens* = following.

sequential key = an identification key composed of a series of alternatives; a dichotomous key.

sequential population analysis = methods of back-calculating stock sizes, recruitment levels, and fishing mortality for different ages or years using catch-at-age data. The past history and present abundance of a stock. This data can be used to predict the numbers of fish in the stock for the next year using sophisticated statistical programmes, allowing determination of the total allowable catch for the next fishing season. Abbreviated as SPA.

sequotype = an unofficial term in nomenclature for the specimen immediately following the holotype in an author's collection sequence.

*ser.* = abbreviation of *series*.

serial = a publication issued at intervals, regular or not; most scientific journals are of this type.

serial spawning = spawning more than once in a season, cf. synchronous spawning.

series = 1) the sample available for study.

series = 2) a rank between subkingdom and phylum.

*series* = series, the sample available for study. Abbreviated as *ser.*

serology = study of serums and the nature of antigens and antibodies.

serous membrane = the membrane lining the pericardial and peritoneal cavities and supporting the organs therein.

serosa = serous membrane.

serpentiform = snake-shaped.

serra = an abdominal spine, formed from a scale in the ventral region of the fish body. A series of these serrae form a saw-like edge and their numbers can be used in identification of some Clupeidae and Serrasalmidae. Also called abdominal serra.

serrate = notched like a saw.

serrated appendage = Wilder's organ (paired serrated appendages in the gill chamber attached to the isthmus by connective tissue and some sternohyoideus muscle fibres in *Amia* (Amiidae). It is supported by bone and equipped with tooth-like structures. Function unknown).

serriform = notched or saw-like edge.

Sertoli cell = a companion or follicle cell enveloping the cysts of spermatogenic cells in the testis.

serum protein = see antigen; usually a blood protein.

servant = a person indentured or engaged on wages or shares for a period in the fishery in Newfoundland.

sesamoid angular = coronomeckelian (a small bone on the postero-lateral part of Meckel's cartilage of the lower jaw. Often a point of insertion of the adductor mandibulae muscle. Also called supraangular, sesamoid articular, articular sesamoid, splenial, os meckeli or *d* bone).

sesamoid articular = coronomeckelian (a small bone on the postero-lateral part of Meckel's cartilage of the lower jaw. Often a point of insertion of the adductor mandibulae muscle. Also called sesamoid angular, supraangular, articular sesamoid, splenial, os meckeli or *d* bone).

sesamoid bone = a supernumerary bone formed from a fragment of an existing bone or by a new ossification; see above.

sessile = with a stalk or pedicel; permanently attached to the substrate.

session = the period of time spent fishing in a day, typically in Europe about 5 hours. May be a morning, afternoon or day session.

seston = particulate organic matter such as plankton, organic detritus and inorganic particles such as silt.

sestonophagy = feeding on seston. Also called suspensiphagy.

set = 1) a single use of a net, pot or string of pots from laying it out to hauling it in.

set = 2) the total units of a longline.

set = 3) the direction towards which a current flows.

set = 4) to pull on a fishing line in order to fix a hook in a fish's mouth; to set a hook.

set gillnet = a gill net fixed to the bottom or a distance above it by anchors or ballast. Also called anchor net, straight net or sunk gillnet.

set impounding net = an impounding net fixed to the bottom so that it cannot be readily moved from place to place over a short time span.

set line = a line with one or more hooks often left unattended in the water, perhaps overnight. Often illegal in various jurisdictions and/or localities such as tidal waters. Some set lines are tended by a fisherman who pulls on the line to set the hook when vibrations are felt.

set longline = a main line, sometimes of considerable length, to which snoods with baited or unbaited hooks are fixed at regular intervals. The main line is set either horizontally on or near the bottom or less commonly near the surface.

set net = a large trap net, of variable size and construction, but having floats, ropes, leaders, main net and anchors or stakes.

set out = to lower a net or line into the water.

set time = the period over which net is allowed to fish before being pulled from the water or the fish removed.

seta = a bristle or bristle-like structure.

setaceous = bristly.

setiform = bristle-like; brush-like.

setline = a line of baited hooks laid out on the sea floor. It is anchored in some way and not free to move with wind or water currents.

setting = used to describe the process of putting a net out, e.g. a trawl into the sea, a gillnet in a lake. Also called paying away and laying out.

setting of the sculls = a tradition at a fisherman's wedding where the bride's female friends arranged the bridegroom's lines in the scull for his first fishing trip as a married man (Scottish dialect).

setting shot = a split shot used on float rigs. It is attached 15-20 cm away from the hook when that stretch of line is lying on the bottom. When a fish takes the bait, it lifts the shot off the bottom and the extra weight is transferred to the float which sinks to indicate the bite.

setting the hook = pulling up on a fishing rod to drive the hook home in a biting fish. Fish may easily recognise an artificial fly as not being food and spit it out or may be wary of baits.

settled species = those fishes living in the same locality and showing no short or long range movements or migrations, e.g. coral reef fishes.

settlement = process whereby pelagic larvae or juveniles adopt a substrate-based life.

settlement stage = the developmental stage of a fish which adopts a benthic or substrate-based life.

settlement success = a measure of the numbers of fish completing the settlement process.

settling check = a check ring on some marine groundfish otoliths, occurring just outside the nucleus and formed when the fish first become benthic in habit.

seu = either, or.

several fishery = an exclusive right to fish derived from ownership of the soil. Compare free fishery and several fishery.

severely fragmented = increased extinction risks to a taxon result from the fact that most individuals within a taxon are found in small and relatively isolated subpopulations. These small subpopulations may go extinct, with a reduced probability of recolonisation.

Severn capon = a sole. See also capon.

seviche = fish marinated in sour lemon juice (see ceviche).

seyne = sean.

sewage pond = an aquaculture facility using treated sewage as a fertiliser.

sex inversion = change of sex naturally or after steroid hormone application. Also called sex reversal.

sex ratio = the relative number of males and females in a population.

sex reversal = sex inversion.

sexing = determination of the sex of a fish, usually by external characters (secondary sex characteristics).

sexual dichromatism = the difference in colour between male and female fish.

sexual dimorphism = the difference in shape and size between male and female fish.

sexual hooklet = one of a series of tiny spines or hooks along the anteriormost rays of the ventral and anal fins of most male Characidae. May also be present on the dorsal and caudal fins. They are used as a coupling device in mating.

sexual parasite = a gynogenetic or hybridogenetic form which uses the sperm of males of bisexual species to activate development of its eggs.

sexual type = a locality type, an unofficial term in nomenclature for absurd or unusual names for types.

sexually active period = that time during its life span when a fish possesses the ability to reproduce.

shack = cleaning, repairing, putting on new hooks and coiling the trawl line.

shack fishing = fishing from a boat where several men operate several lines and are responsible for their own gear.

shad = 1) the common name for certain members of the herring family Clupeidae. An Old English word for these fishes.

shad = 2) a term of abuse (rare).

shad bird = the Wilson's snipe (*Capella gallinago*), appearing at the same time as shad runs in North America.

shad bush = North American shrubs of the rosaceous genus *Amelanchier* whose white blossoms open in April or May, when the shad run. The blossoms were also taken as indicative of thawed ground for the burial of the winter's dead.

shad coat = a Quaker coat, from its shape resembling a shad. See shad-belly coat.

shad fly = mayfly.

shad frog = *Rana halecina*, so named because it appears at the same time as the shad runs in rivers.

shad planking = 1) a political gathering in Wakefield, Virginia held every four years where shad feature prominently on the menu. Originally a tribute to the start of the fishing season.

shad planking = 2) slang for a high density of posted signs, based on the above gathering which featured tens of thousands of political signs.

shad roe = the eggs of shad, served parboiled, sauteed or baked.

shad wallow = the spawning grounds of shad.

shad wash = 1) the splashing sound of shad spawning.

shad wash = 2) the spawning ground of shad, from the washing, splashing or swishing noise made.

shad-bellied = 1) of a coat or rarely of a waistcoat; see shad-belly coat.

shad-bellied = 2) of a person, having an abnormally thin or flat belly.

shad-belly = a Quaker, from shad-belly coat.

shad-belly coat = a Quaker coat, from its shape resembling a shad, sloping gradually from the front to the tails without any angle.

shadow stalking = a behaviour where the fish follows another organism around as an easy way to locate food, e.g. a trumpetfish following a spiny lobster on a reef as the latter disturbs sand looking for food, the fish darting in to seize food the lobster misses.

shadow zone = the gently sloping bank of a meandering river.

shadscales = money (American slang). See also scales.

shafe = a flake of cooked fish (Scottish dialect).

shagreen = 1) untanned sharkskin retaining the placoid scales; it has a rough sandpaper-like surface and was formerly used for sandpaper, sword grips, etc.; also used to refer to the skin of sharks which has been treated by filing down and painting or varnishing to produce a form of leather. May be derived from the Farsi *saghari*, which is a leather made from ass skin which has an indented surface obtained by spreading the moist skin over *Chenopodium* seeds.

shagreen = 2) used in a general sense for any structure having the appearance of shagreen, i.e. bearing many, small, irregularly-placed, round protuberances.

shakeii = whole or gutted fish boiled in brine (Taiwan).

shale = the mesh of a fishing net (Kentish dialect).

shallop = a large fishing boat (over 35 feet, 10 m), partially decked and a vessel type between a skiff and a schooner. Used in the cod and seal fisheries of Newfoundland.

shallop tub = a large and heavy tub used to carry bait and cod in Newfoundland. It was a 200 lb flour or salt-meat barrel with about a quarter sawn off the top and rope handles added.

shallow water zone = the area from the lake shore to the first major dropoff.

shalloway = a French vessel later used by the English in the offshore fishery, especially for collecting fish from smaller craft and transporting them to shore for curing. Also called sherway.

shan = said of fish when reluctant to bite (Scottish and English dialect). Also spelled shand, shandy and shannie.

shand = shan.

shandy = shan.

shanglo dal = a purse net operated in river upper reaches and estuaries from a dug-out canoe (India).

shank = the main stem of a hook, *q.v.*, between the eye and the bend. May be long- or short-shanked, depending on types of bait used, rounded (regular) or flattened (forded).

shannie = shan.

shanty town = a collection of ice-fishing shacks.

shape = the curved part of a hook, *q.v.* Also called bend.

share = a proportion assigned to owner and to the crew based on the value of the catch taken by a fishing voyage after deducting the expenses of the enterprise (the boats's share). Often instead of wages (Newfoundland).

shared stock = 1) a stock that migrates across an exclusive economic zone (EEZ) of adjacent states.

shared stock = 2) a stock fished by two or more countries.

shareman = a member of a fishing crew who receives a proportion of the profits of a voyage rather than wages.

shark = 1) a member of the Selachimorpha or Selachii, a group of fishes with over 400 species world-wide mostly in warmer marine waters.

shark = 2) a name for fish unrelated to true sharks, e.g. *Epalzeorhynchos bicolor*, the red-tailed black shark, a cyprinid popular in aquaria.

shark = 3) a swindler, pickpocket or pilferer (slang).

shark = 4) to live by swindling; to take advantage of someone.

shark = 5) to drive around a parking lot looking for a space.

shark = 6) a word commonly used for sport teams, advertising gimmicks, military equipment, movies (see jaguar shark), and in slang.

shark = 7) a custom-house officer (slang).

shark = 8) a recruit (military).

shark = 9) reckless absence from college duties, said of persons or their conduct at Yale (slang).

shark = 10) a lean and hungry hog (western United States slang).

shark = 11) to beg for a dinner (slang).

shark = 12) a heavy drinker (Cameroon).

shark and tatties = fish and chips (New Zealand slang).

shark attack = 1) something to be avoided by humans. There about 70-100 attacks on humans each year with 5-15 fatalities. Lightning, bee stings, dog bites and snake bites all produce more fatalities than sharks. The great white (*Carcharodon carcharias*), tiger (*Galeocerdo cuvier*), oceanic whitetip (*Carcharhinus longimanus*) and bull sharks (*Carcharhinus leucas*) account for most fatal attacks on humans. Oceanic whitetips are often associated with ship sinkings or plane crashes and bull sharks with fresh water as well as marine attacks. Most attacks are in warmer waters since there are more sharks there in terms of individuals and species, and more humans swimming. Attacks can be "hit and run" in surf areas, presumably a human being mistaken for prey, or the shark defending territory, "bump and bite" attacks where the shark circles the human, and bumps with the snout before biting, and "sneak" attacks which occur without warning. Hit and run attacks usually involve minor leg lacerations while the latter two involve severe injuries and death.

shark attack = 2) name for several bands, including a reggae band from Texas, a surf song band from Louisiana, and a rhythm and blues, soul and funk band from England.

shark cartilage = touted as a cure for cancer based on the observation that sharks don't get cancer because something in their cartilage inhibits angiogenesis (blood vessel formation that tumours need to feed and grow). The absence of cancer in sharks is disputed. Cancers are documented, even in cartilage, but perhaps they are not as common as in other vertebrates. Not all cancers need angiogenesis. The preparation of the cartilage for human use often leaves something to be desired and any active element may well be no longer present. Ingesting cartilage does not mean significant amounts will reach the cancer site. Some more careful preparations have shown inhibition of blood vessel growth in tumours but also failed to prolong survival of patients with metastatic kidney cancer.

shark fence = a fence, often made of wire netting, enclosing an area to protect swimmers from sharks, e.g. in Australia.

shark fin = a Japanese flavour of ice cream, made with many others in response to a hot summer in 2004. See also saury and brandy, and eel.

shark fin soup = a Chinese soup made of shark fins according to various recipes. May include chicken broth, chicken breast, ham, scallops, mushrooms, green onions, ginger and other seasonings. The fins may need to be boiled for 2-3 days and the cartilaginous elements are tasteless; much of the taste comes from the other ingredients. Can cost \$130 a bowl (in 2003). See finning.

shark flies the feather = the observation by sailors that sharks will scavenge many items, even inedible ones, but do not take fowls or sea birds.

shark god = shark gods, known as Aumakua, are guardians of the sea and particular ones, manifested as sharks, protect family members in Hawaiian mythology. There are at least 11 shark gods in this mythology.

shark liver oil = shark oil.

shark man = 1) the mythological storm god of Japan.

shark man = 2) a character in the video game Mega Man III; his weapon is a Shark Boomerang.

shark oil = a fatty, yellow to brown oil obtained from the livers of sharks. Used for dressing leather, as a source of vitamin A and in a popular haemorrhoid preparation.

shark pit = a depression in the sea bed where sharks gather, the area being well-oxygenated by wave action and protected. Juvenile sharks rest here before leaving to forage and females use the area to give birth and as a nursery.

shark rattle = coconut shells or snail shells moved to and fro on the surface of the water in Oceania. The rattling noise attracts sharks which are then caught by a loop of line slipped over their heads.

shark repellent = 1) a chemical compound or electronic device that discourages sharks from attacking humans. Electronic devices irritate the ampullae of Lorenzini (*q.v.*) and are fairly effective. Chemical compounds are less so. Copper acetate and black dye used by sailors in

World War II was ineffective. The Moses sole (*Pardachirus marmoratus*) produces a milky chemical from its dorsal and anal fins that freezes the shark jaw and generally repels sharks. The man-made version, pardaxin, was only effective when squirted into the shark's mouth (rather risky).

shark repellent = 2) a measure undertaken by a corporation to discourage unwanted takeover attempts.

sharkie = a notched spanner (wrench) resembling a shark's jaw.

sharking = 1) catching or angling for sharks.

sharking = 2) living by trickery, swindling.

sharking = 3) moving rapidly or aggressively, in humans.

sharking = 4) pulling down women's underwear, there being both top sharking and bottom sharking (slang).

sharks and minnows = a pool game where one person is the "shark" and the rest are "minnows". The shark tries to tag the minnows before they can swim across the pool. A tagged minnow becomes the shark in the next round. The game continues until all minnows have been tagged. Variations on this simple explanation exist. Also called sharks and maidens. See also fish-out-of-water.

Sharkwater = an acclaimed Canadian documentary appearing in 2007, written and directed by Rob Stewart. Details how sharks are being driven to extinction and attempts to debunk myths.

sharp frozen fish = fish frozen by laying out on refrigerated shelves or in a cold store.

Sharpey's fibres = fibres in scales of Brachiopterygii and Lepisosteidae. Also known from bones and teeth, these fibres are formed of periosteal connective tissue collagen.

shatterpack = frozen fillets separated by a continuous, interleaved sheet of polyethylene. Dropping or shattering the pack separates the fillets.

shauling = killing salmon in shallow water by spearing them (Scottish dialect).

shaur = a surface ripple caused by fish moving below (Scottish dialect).

shauve-acker = a person liberal with money or goods, from the practice of Moray Firth fishermen in Scotland who strewed offal on the water near shore to attract fish.

shear = 1) one of a series of a sloping poles on which nets are hung to dry (Newfoundland). See also net gallows, net horse and scaffold.

shear = 2) one of a series of heavy logs (also called shores) placed crosswise as support for an elevated platform (or flake) on which fish are dried (Newfoundland).

shearboard link = backstrop link (a triangular steel link with rounded corners on the back of a trawl's otter board. The backstrop is attached here. Also called board link, door sling ring and VD link).

shearing board = a flat board used in angling and commercial fishing to make the line shear laterally or downward. Lateral shearing enables two lines to be towed behind a boat and downward shearing helps send the baited hook into deep water. Also called paravanes and otter boards.

shears = sloping poles on which nets are dried (Newfoundland).

sheen = 1) a glistening surface brightness often seen on freshly caught fish.

sheen = 2) the backbone of fish (Scottish dialect). Sheens were extracted in preparing fish and sold as cheap food in Scotland.

sheer = a sweeping circular motion used in throwing a castnet for capelin (*Mallotus villosus*) in Newfoundland.

sheet = 1) lint (netting in the main body of a drift or gill net. Also called body, middle twine, middle yarn, netting, webbing, yarn).

sheet = 2) to block the entrance to a cruipe (q.v., a fish trap) with a tarred sheet to prevent fish from ascending the river (Scottish dialect).

shelf break = region where the continental shelf and continental slope meet; i.e. where the more gently sloping region of the seabed adjacent to a landmass rather abruptly slopes steeply down towards the ocean depths; commonly around depths of 200 m. May be used as the limit for summarising national ichthyofaunas.

shelf edge = a narrow zone at the outer margin of a shelf along which there is a marked increase of slope.

shelf escarpment = the edge of the bank or shelf where depth increases rapidly into deep oceanic water.

shelf fauna = refers to those animals living on or over the continental shelf (0-200 metres, rarely shelf extends to 300-400 metres).

shelf life = the length of time a fish or fish product can remain available for sale before deteriorating. Varies with how the fish has been processed and how it is stored and displayed. Even commercial, pre-packaged baits for angling have a shelf life, e.g. boilies, q.v.

shelf reef = a reef that forms on the continental shelf of large land masses.

shelf stowage = fish stowed at sea head to tail and belly down on ice but without ice on top or on the sides.

shelf-edge reef = ribbon reef (a large, offshore and linear reef, seaward of a fringing reef, which is elongate but does not form a barrier to the land. Also called sill reef).

shelf-slope = a line marking a change from the gently inclined continental shelf to the much steeper depth gradient of the continental slope.

shell-gland = the portion of the oviduct in certain Elasmobranchii which make the egg capsule or shell.

shellfish = not fish but crustaceans (crabs, lobsters, shrimps) and molluscs (clams, mussels, periwinkles, scallops).

shelter = an artificial structure made from twigs, brush, branches, concrete blocks, etc. as a refuge or hiding place for fish at which they are also easily caught. See fish apartment house.

shelter brooder = a general term for cavity brooders and mouth brooders, *q.v.*

sheway = shalloway.

shidal sutki = sun-dried fish immersed in water, drained, packed with fish oil in containers and buried in the ground for several months.

shifted otolith = an otolith which has moved in the sacculus. This is recognized by growth along a different axis from previous growth. Shifting often occurs in conjunction with crystallization of an otolith.

shigellosis = bacillary dysentery caused by *Shigella* and found in fish from polluted waters, contaminating fish products in unsanitary conditions.

shimi = ornamental carp or koi (*q.v.*) with undesirable tiny black spots, appearing particularly in older fish, spoiling their pattern.

shimmies = swinging sickness.

shimmy = shimmies.

shine = light reflections from fish below the water surface.

shingler = sinkler-codlin.

shioboshi = whole or split fish dried after soaking in salt water or dry salt (Japan). Usually the name of the fish used is appended.

shiokaza = fermented viscera of skipjack tuna (Japan). The product is a brown, salty viscous paste made by fermenting the raw material with salt in containers for up to a month. It is packed in glass or plastic containers.

ship fishery = the English migratory fishery in Newfoundland waters.

ship green = to stow cod aboard a vessel salted but not dried .

shiraboshi = sun-dried or artificially-dried unsalted fish (Japan).

shirako = sperm sacs of the cod fish as served in a sushi restaurant.

shiraz = a mutated strain of zebrafish lacking haemoglobin, named for the wine. Other mutants are chianti and chardonnay. These zebrafish (*Danio rerio*) are used in studies of haemoglobin formation as their inner body parts are easily seen in these small and transparent fishes and their genome has been sequenced.

shirt buttoned shot = adding small lead weights or shot to a fishing line under a float or bobber at regular intervals like shirt buttons so that the line sinks evenly and slowly.

shiver = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for sharks.

shoal = 1) a social group of fish, e.g. in shallow water or at the surface, cf. school where synchronised swimming is the criterion.

shoal = 2) a submerged ridge, bank, or bar covered by mud, sand or gravel which is at or near enough to the water surface to constitute a danger to navigation.

shoal = 3) said of waters where there is a change in depth from deep to shallow.

shoal = 4) to become shallow gradually.

shoal = 5) to proceed from a greater to a lesser depth of water.

shoal = 6) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for barbels.

shoal = 7) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

shoal = 8) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for herrings.

shoal = 9) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for mackerel.

shoal = 10) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for minnows.

shoal = 11) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for perch.

shoal = 12) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for pilchards.

shoal = 13) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for roach.

shoal = 14) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for salmon.

shoal = 15) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for shad.

shoal = 16) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for sharks.

shoal = 17) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for sticklebacks.

shoal = 18) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for trout.

shoal cod = cod that are found in inshore waters.

shoaling fish = large schools, usually of small pelagic fish.

shock leader = a length of strong line (about 6-10 m) connecting the rig to the main reel line and meant to absorb the shock when making long-distance casts with heavy weights and swimfeeders (*q.v.*). Also protects against abrasion from teeth or hard bottoms.

shock tippet = in angling, a heavy section of leader above the fly as protection against abrasion and the teeth of the fish.

shocking = physical agitation of eggs where infertile eggs turn white and can be removed.

shoe = sole plate.

shoe dhoni = an Indian estuarine boat used to operate stake nets, wide and flat forward, narrow aft and propelled by poles or by outboard motors.

shoot = set out, as in shooting a trawl. See also shot.

shoot carp = a carp population showing an asymmetrical increase in weight variation due to interactions between individuals in the population and competition for food.

shooting fish in a barrel = slang for doing something guaranteed to be successful.

shooting fry = fry that grow rapidly.

shooting head = a heavy section of fly line attached to a thin running line, used for long distance casting. Easily changed according to conditions.

shooting line = extending the cast of a fly line by releasing line held in the hand not holding the rod during the forward cast.

shooting net = a conical net of various materials and sizes, used in running water to catch fry carried by the current.

shooting taper = shooting head.

shore = 1) the land bordering a large body of water.

shore = 2) shear.

shore boat = any small undecked craft used in the coastal fishery of Newfoundland.

shore cure = salt curing of fish on shore as opposed to on a ship. Also lightly salted Kench cured (*q.v.*) cod in North America, hard dried to 32-36% moisture and 12% salt in the flesh.

shore fish = 1) cod (*Gadus morhua*) in, or migrating to, coastal waters in Newfoundland.

shore fish = 2) shore cure.

shore fishery = a fishery carried out in inshore or coastal waters in small boats, e.g. for cod in Newfoundland.

shore labrador = cod caught in Labrador waters and prepared for market with light application of salt and extended drying period (Newfoundland).

shore meal = fish consumed on shore forming part a daily catch limit.

shore reef = fringing reef (a coral reef formed as a narrow band close to shore).

shore season = period when the cod fishery in inshore or coastal waters is carried out from small boats (Newfoundland).

shore seine = beach seine (a net used to encircle fish in shallow water; usually operated by two people wading out from shore, the net has lead weights to keep the bottom on the sea floor and floats to keep the top of the net at or near the surface; there may be a bag extending back from the centre of the nets length to increase capture efficiency. The seine may be set from a boat but hauled in from the land).

shore skipper = retired fisherman.

shore species = marine fishes that are always found near the shore.

shore weir = barricade (a barrier used to lead fish into an enclosure, e.g. fyke net, pound net, etc.).

shoreline = the waters inside and shoreward of the 2 metre depth contour below the chart datum (0 tide) or, more simply the water's edge, its position varying with the tide.

shoreman = beachmaster (a person responsible for curing and drying fish on shore in Newfoundland).

short line = a short piece of line attached to the end of a pole (a very long fishing rod used in Europe). This allows fast strikes at bites from small fish and gives greater control over the float in windy conditions.

shore rope = a rope connecting a net with the shore.

short leader = a section of netting fastened to the landward side of the leader of a cod trap and fixed to the shore.

short seasonal pond = a pond containing water for 3-4 months in a year.

shore seine = a type of seine hauled ashore, usually with one wing shorter than the other.

short bath = in aquaculture, a treatment with a high concentration of a chemical against parasites, for example, for a short period such as one hour, where water flow is stopped in the facility.

short strike = a bite by a fish that misses the lure or bait, usually the fish hits part of the lure or bait but not the hooks.

shortwiring = a trawling technique where the net is brought up out of the level it was fishing at but not out of the water. The otter boards may or may not be brought on board. The trawler continues to tow, often at a reduced speed, to keep the fish in the net. The purpose is to keep the fish in good condition until a catcher boat arrives to take the fish to a mothership for processing, or to prevent the cables from tangling while turning the trawler around, or simply to see the amount of fish caught.

shot = 1) split shot.

shot = 2) a single piece of net in a fleet of gill nets.

shot = 3) shoot, that is the setting of nets.

shot = 4) a catch of fish, in nets or a boat.

shot = 5) a reach, a fishing ground at sea or a place where nets are shot.

shot bite = a fish nibbling at the shot (lead weight) on a line giving a false bite. Happens often when hemp bait (a round black seed) is used in roach (*Rutilus rutilus*) fishing in Europe.

shot fare = the mackerel season about the beginning of May in Kent.

shot head = the upper part of a shot (a set of nets) in a river.

shot net = a mackerel net (Kentish dialect).

shot-by-shot = pertaining to each separate deployment of fishing gear by a vessel.

shott = a depression surrounding a salt marsh or lake, or the bed of a dried salt marsh (in North Africa). Also spelled chott.

shotten = recently spawned and thus less desirable as food, e.g. especially said of herring.

shotten herring = 1) recently spawned herring.

shotten herring = 2) worthless or spiritless persons.

shotter = a boat of 6-26 tons used in the mackerel fishery (Sussex dialect).

shotting pattern = the arrangement of split shot on the line below a float. This varies with the float type, the rig, and the fishing conditions. Shot can be grouped together, making the line sink swiftly and thus avoiding small or unwanted fish, or spread out so it sinks slowly and fishes all depths.

shottsuru = a fermented fish sauce produced by pickling the sandfish (*Trichodon trichodon*) with salt and malted rice (Japan).

shotver-men = the mackerel fishers at Dover named for their shot nets.

shoulder = in food preparation, the thickest part of a fish, just behind the head.

shoulder bone = the bone at the shoulder of a fish that forms the leading edge of a belly flap, q.v., in preparing fish as food. Also called collar bone, lug bone and nape bone.

shoulder girdle = pectoral girdle (the bony support of the pectoral fin behind the gills and usually attached to the posterior part of the skull; the "shoulder" girdle. Composed of the following basic elements (some of which may be lost): coracoid, scapula, pterygials, postcleithrum, cleithrum (main bone), supracleithrum and posttemporal. The "primary" pectoral girdle includes actinosts, scapula, coracoid, and sometimes mesocoracoid cartilage or endochondral bones and supports the fins directly. The "secondary" (and more primitive) pectoral girdle encloses the dermal post-temporal, supracleithrum, cleithrum, and two postcleithra, which are membrane bones and is only indirectly related to the fins. Also called scapular girdle).

shoulder net = a fishing net fixed on a pole and resting on the fisherman's shoulder.

shoulder organ = a black-lined pit or sac under the cleithrum in members of the Platytroctidae which is connected to the exterior by a tube visible above the pectoral fin. The sac produces a luminous fluid which can be discharged to confuse predators.

shouldered = a form of fish preparation where the head, viscera, and belly flaps are removed by a cut made from the back of the head to the rear of the belly cavity.

showa = ornamental carp or koi (q.v.), being black fish with a red and white pattern.

showers of fish = fish falling from the sky, attributed to unusual meteorological conditions scooping them up from surface or shallow waters and later dropping them. Variously attested and derided.

shredded = grated (commercially, a mixture of particles of fish that have been reduced to a uniform size but are discrete and do not comprise a paste).

shredded cod = small pickle cured cod reduced to small dried fibres in a machine. Drying is at 65.5°C. Also called fibred or flaked cod and skriggled cod.

shrink = 1) loss of weight in fish due to fluids draining from the food product. Also called drip or purge.

shrink = 2) loss of seafood when it becomes too old to sell.

shrinking = a mathematical procedure to assess fishing mortality in the latest year so that it does not differ markedly from the average for the preceding three years. Mortality can be difficult to estimate in more recent years.

shui yu = sleeper goldfish.

shusui = ornamental carp or koi (*q.v.*), being a blue and orange fish, partially covered with large mirror scales.

shut-off seine = a seine used to enclose a bay or area of water.

shutter trap = a device with a hook connected to a spring mechanism and spike. The hook is baited with a small fish and, when the prey bites this hook, the spring is released and the spike pierces the head of the prey or at least grips it, e.g. used for pike in Sweden and France. See also fish trap.

sib = short form of sibling.

sibling = progeny of the same parents.

sibling species = closely related and often sympatric species that are reproductively isolated but morphologically indistinguishable. Also called cryptic species.

*sic* = thus, in this manner; calling the reader to note spelling or reference is just as given, even though this is in error in the original cited.

sick goldfish call = a query from a member of the public addressed to a museum scientist on an ichthyological topic, occasionally and actually about a sick goldfish. Implies that the query cannot be answered, as museum scientists work with pickled fish and are not experts at maintaining fish in aquaria, or the query lacks sufficient detail to be answered with authority, as in failure to observe key characters used in identification of a caught and discarded fish.

sid = sud.

side = 1) a single fillet, usually from a salmon.

side = 2) either of two vertical sections of netting forming the walls of a cod trap.

side channel = a lateral channel with an axis of flow roughly parallel to that of the main channel. It is fed by water from the main channel but has a lesser flow.

side piece = netting attached on either side of the belly to join the upper and lower parts of a four panel trawl.

side trawler = a fishing vessel that deploys its trawl-net over the side of the vessel.

side wedge = side piece.

side wing = the lower or upper wing of a side panel or a four panel trawl.

side-mounted reel = a fishing reel with its foot on the side of the reel frame.

side-set trawler = side trawler.

sided = a fifteenth century word for dressing haddock (preparing this fish for consumption), no longer in use.

siemen = a metric unit of conductance, a reciprocal ohm or mho.

sieve netting = a piece of netting with a mesh size which must be at least twice the mesh size of the codend. Its purpose is to catch fish selectively.

siever = all the fish caught at one tide (Sussex dialect).

sight (noun) = 1) a position on the bank of a salmon river where fish can be observed.

sight (verb) = 2) watching for salmon movements in a river.

sight fishing = angling in clear water where the fish are visible.

sight line = a horizontal line or groove running forward from each eye, used by the fish to aim attacks on prey. The sight line facilitates judgement of depth and distance.

sighting seat = a look-out post for salmon in a river.

sightman = a look-out at a sight.

sightsman = sightman.

sigmoid heart = the s-shaped heart which develops from the primitive heart tube.

sigmoid position = an s-shaped position (viewed from above) adopted by fish in social interactions.

sign = the appearance of migrating fish in coastal waters, their numbers or amount (Newfoundland).

sign stimulus = the cue (visual, olfactory) which starts an innate behavior pattern, e.g. courting behavior in a male stickleback is instigated by the sign stimulus of a silver colored female (or model) with a swollen abdomen. Also called a releaser.

signature = 1) letters or figures placed at the foot of a page of printed matter to identify unnumbered pages.

signature = 2) sections of a book marked to show how these should be bound together. Signatures may be distributed separately and have differing publication dates which has significance in nomenclature.

silage = liquefied fish waste produced by self-digestion, with the addition of acid to prevent decay, or fermentation and used for animal feed. Also called liquid fish.

sild = market name for a young herring processed as a sardine in Norway.

sile = the fry or young of fish, especially herring (Scottish dialect).

silhouette = the appearance of a dry fly as it presents to a fish, ideally resembling a natural food item.

silk worm dregs = silkworm faeces, slough and mulberry residues, rich in organic matter and used as food for fish in aquaculture. About 8 kg of dregs produces 1 kg of fish.

sill = 1) shallow entrance to an enclosed body of deeper water.

sill = 2) milt (Scottish dialect).

sill fish = a male fish (Scottish dialect).

sill reef = ribbon reef (a large, offshore and linear reef, seaward of a fringing reef, which is elongate but does not form a barrier to the land. Also called shelf-edge reef).

siller-back = any fish with a white or silvery back (archaic).

sillock = *Pollachius virens*, the saithe of Europe (Scottish dialect).

sillock bru = fish soup made with coalfish (Scottish dialect).

sillock heuk = a bait-hook for sillocks (Scottish dialect).

sillock oil = oil made from the livers of sillocks (Scottish dialect).

sillock pock = a bag-net for catching sillocks (Scottish dialect).

sillock rod = a fishing rod for sillocks (Scottish dialect).

sillock-pocker = a maker of sillock pocks (Scottish dialect).

silluck = sellok.

silluk = sellok.

silo culture = aquaculture using large vertical containers, inside or outside a building.

siloryb = fish and fish offal treated with hydrochloric, sulphuric and formic acids to form dry pellets as commercial feed for *Cyprinus carpio*.

silt = mineral particles 0.02-0.002 mm (or 0.004-0.062 mm, sources vary) in diameter, intermediate between clay and sand.

siltation = deposition of silt; on spawning grounds can smother fish eggs.

silting = siltation.

Silurian = a geological period within the Palaeozoic ca. 441-113 million years ago. Most of the major groups of fishes are thought to have originated in the Early Silurian. Abbreviated as S.

silver cured herring = 1) very heavily salted, mild smoked herring.

silver cured herring = 2) herring less heavily salted and smoked than red herring (q.v.)(United Kingdom).

silver cured herring = 3) a hard dried, salted herring, not smoked (Netherlands).

silver fish = silverfish (1).

silverbright = chum salmon harvested at sea rather than in fresh water.

silverfish = 1) any fish having silvery scales. Now used in Britain by anglers to denote a group of cyprinids such as the bream, *Abramis brama*, but excluding sought-after carp (*Cyprinus carpio*) and other non-silvery appearing species.

silverfish = 2) a silvery variety of *Carassius auratus*, the goldfish.

silverfish = 3) not a fish but a primitive, wingless thysanuran insect with a body covered in silvery scales, commonly found in houses, e.g. *Lepisma saccharina*.

similarity = a generic measure of the resemblance between two objects, usually on a scale from 1 to 0.

simple = not divided or branched.

simple ray = an unsegmented, unbranched soft ray.

simulation = a predictive analysis showing production and harvest of fish using mathematical formulae. Can be deterministic, where for each set of inputs there is one output of the calculation, or, stochastic, where multiple calculations are performed to characterise the range of variability in the results.

simultaneous hermaphrodite = synchronous hermaphrodite (organisms with simultaneously developed ovarian and testicular tissue).

simultaneous publication = publication of two or more names for a single taxon in the same work, other than alternative names when simultaneously published names compete.

sinaeng = gutted full-grown mackerel packed in clay pots or other containers with or without spices, steamed-cooked or simmered over a slow fire (Philippines). See also paksiw.

sinciput = the upper half of the cranium, especially the anterior portion above and including the forehead; the forehead.

*sine* = without.

*sine descriptio* = without a description, e.g. in nomenclature.

*sine numero* = without number; used to indicate absence of a collector's number from a list of specimens. Abbreviated *s. n.*

*sine typo* = without a type.

singing reel = the high frequency clicking of a click drag reel caused by a big fish rapidly pulling off line.

single action = a fly reel where one turn of the handle causes one turn of the spool. Also called single-action reel.

single fillet = a fillet of flesh removed from one side of a round fish such as cod. Each fish produces two such fillets and the belly wall may be left on or cut off. Also called side.

single fish = slang for urination (Scotland).

single gill net = set gill net.

single haul = in fly fishing, pulling out line in a false cast (in the air) only on the forward swing.

single hook = a fish hook with one point.

single naping = cutting through the belly wall on one side only when preparing fish.

single rig = gear comprising a single trawl net.

single side = single fillet; particularly used for salmon fillets.

single species fishery = a fishery where only one species of fish is targeted.

single species model = a model of species dynamics not including interactions with other species.

single-action reel = a fishing reel whose spool rotates at the same speed as the crank, as opposed to a multiplier reel.

sinistral = left; referring to flatfishes having the left-hand side uppermost.

sink = habitats where birth rates are lower than death rates and emigration lower than immigration, as applied to equilibrium populations. See also source (3).

sink net = set gill net.

sink rate = the speed at which a fly line sinks. There are 6 or more different rates for fly lines from very slow to extremely fast.

sink tip = a fly line with a floating section except for the last 3 metres that sinks. Used in fast water and in some still water situations.

sink-and-draw = an angling retrieval technique where the lure is allowed to sink and then lifted by lowering and raising the rod.

sinkant = a liquid applied to artificial flies to make them sink.

sinker = 1) a lead weight attached to a fishing line to enable it be cast out further, to maintain position of the bait in fast water, or to sink a line and its baited hook to a particular depth. Available in numerous weights and patterns for varying conditions. See also drift sinker.

sinker = 2) baits such as trout pellets designed to sink in the water.

sinker = 3) one of the lead weights on the bottom of net, meant to keep the net on the bottom or the lower edge at depth relative to the upper edge. Also called weights.

sinker = 4) a rock dangerous to vessels.

sinker stone = a stone used as a weight for sinking a fishing line or net.

sinking feed = food pellets in aquaculture that sink when thrown in the water.

sinking line = a fly line designed to sink in the water and position a wet fly or streamer deeply.

sinking tip = in fly fishing, a line weighted at the tip to sink the fly in deep water. An intermediate line sinks about 1 inch in a second and is used on lakes to cast in windy conditions and to sink below the waves. A full-sinking line are used for fishing at depth; their sink rates can go up to 8 inches per second. Sink-tip lines are used in rivers; the first 5-15 feet sinks but the rest of the line floats and facilitates control; sink rates are 1-5 inches per second. Integrated-head lines are used for casting long distances and sinking quickly; the front, sinking portion or

head is between 20 and 30 feet and is followed by a thin running line, floating or intermediate in type.

sinkler-codlin = a cod with a large head and small or lean body (Scottish dialect). See also shingler.

sinks = sinker (1).

sino-auricular valve = one of the valves at the sinus venosus and atrium junctions in the heart, q.v. Presumably sino-atrial is more correct.

sinuate = curved, having a curved border.

sinuosity = degree of meandering of a river channel.

sinusoidal = wavy or tortuous.

sinus = a space in the tissues of an organism, usually a blood cavity, e.g. in the Myxinidae.

sinus venosus = a heart chamber collecting blood from the paired common cardinal veins and delivering blood to the atrium; see heart.

siphon = 1) a blind sac at the base of the claspers communicating posteriorly with the apopyle; contracts to eject the sperm from the tube formed by the clasper in Selachii.

siphon = 2) strictly a u-shaped tube but used in some fish descriptions of the gut shape to indicate an elongate s-shaped tube. Also spelled syphon.

siqqu = a fermented sauce made from fish, shellfish and grasshoppers, used in the kitchen and at the table, in ancient Mesopotamia.

siren = a symbolic figure appearing as a fish-woman (or bird-woman). Sirens with fish tails inhabited rocky islands and cliffs and could entice sailors to their doom by their song.

Siskiwit = Siskowit.

Siskowit = a place name in Michigan (and its variant cisco), meaning a mooneye, cisco or lake trout, from the Ojibwa for fish having a certain kind of flesh.

sister group = a taxon thought to be the closest relative of a given taxon, exclusive of the ancestral species of both taxa.

site fidelity = the degree to which species or individuals are confined to a community or physical location.

siver = syver.

size class = fish of a certain size, often related to age classes.

size cod = cod of twenty four inches and more in length, measured from the back of the head to the tail, paid as duty (Scottish dialect).

size distribution = the number of fish of various lengths or weights in a sample or catch.

size fish = fish payable as import duty.

size frequency distribution = length frequency distribution (the number of individuals encountered in each length interval).

size group = a group of fish falling within a given size range.

size limit = a legal limit on the size of fish that can be caught, either minimum or maximum. A minimum size allows fish to grow to a marketable size and to reproduce and a maximum size limit protects large and successful spawning adults.

size sample = a sample taken from landings of fish used to determine size distribution of catches for stock assessments.

size selection = size selectivity.

size selectivity = the way fishing gear selects fish by size, usually allowing the small fish to escape and grow to be caught later at a marketable size.

size-at-age = length or weight at a particular age.

size-at-first-capture = a limit set on when the smallest fish can first be caught in a fishery, allowing the fish time to grow to a marketable size and allowing reproduction.

size-at-first-maturity = length or weight at maturity. Maturity is defined as minimal size attained at maturity or the size at which 50% of the fish at that size are mature.

sizing fish = a procedure where pickled fish is graded by size before brining begins.

Skagen net = a wing trawl fished like a seine net or as a conventional trawl (Scandinavia).

skantack = scantack.

skate = members of the Rajoidei, Rajidae (skates) and Anacanthobatidae (smooth skates), or more generally those members of the Order Rajiformes that are termed skates.

skate barrow = the egg case of a skate.

skate bree = the water in which a skate has been boiled (Scottish dialect). A folk remedy for sprains and rheumatism in man, gout in pigs, and lameness in cattle.

skate purse = the ovary of a skate.

skate rumple = the caudal part of the backbone of a skate above the root of the tail (Scottish dialect).

skate shears = skate sheers.

skate sheers = the pelvic fins of the male or claspers (Scottish dialect).

skate soup = a broth made from skates supposed to have aphrodisiac and other properties.

skate wing = the enlarged pectoral fin joining to the head and body found in Rajoidae. Used as food, the flesh separating into fingers of meat with a rich gelatinous texture, resembling scallops.

skeletal system = the notochordal, connective, cartilage, bone and associated tissues that support the body, anchor the muscles and protect delicate organs.

skeletochronology = age estimation using marks or zones found in the fish skeleton.

skeleton = all the cartilaginous and bony elements comprising the exoskeleton (or dermoskeleton) which includes the dermocranum, secondary pectoral girdle and scales, and the endoskeleton. The latter has a somatic axial component comprising the neurocranium, vertebral column and paraxial elements, a somatic appendicular component comprising the median fins, paired fins, radials, pterygiophores and fin rays, and a visceral component, the viscerocranum, comprising the mandibular arch, the hyoid arch and the branchial arches.

skeo = a small building made of dry stone walling which allows wind drying of fish (Scottish dialect).

skeo blawn = fish cured by drying in a skeo.

skemell = scamel.

skiff = a small boat, propelled by oars or powered; any small, light boat. Used in purse seine fisheries, for example, to pull the net in a circle from the main ship around the school of fish to be caught.

skiff-load = the number of fish a skiff can carry (Newfoundland).

skimmer = 1) young silver bream, *Abramis brama* (Cyprinidae).

skimmer = 2) protein skimmer (an aquarium chemical filtration system which removes dissolved organic compounds and microscopic particles. Many small bubbles are sent through a column of water, forming a foam, to separate dissolved organic compounds from the water. The compounds and particles stick to the bubbles and are carried to the top of the unit where they are collected in a removable cup. They come in four varieties, downflow, venturi, counter-current, and co-current and are only really effective in salt water. They may be placed in the tank, hung on the side, or placed in a sump. Also called a foam fractionator).

skimmer = 3) a young man who catches with a hand net any herring that drop from the main net when it is hauled in (Scottish dialect).

skimmer bream = skimmer (1).

skimming = repeated stocking and harvesting in aquaculture to maintain a gap between carrying capacity and standing crop.

skimming net = a triangular net supported by cross-shaped poles that can be clapped together to close the hand-held net. Used for catching small fish while wading or from a small boat.

skin = a museum specimen of a fish preserved as a skin without the interior organs and musculature. Some old type specimens are in this form.

skin a cat = more than one way to skin a cat (usually applied to felines but in the southern United States where eating catfish (Ictaluridae) is common, applied to a fish and also meaning there is more than one way to do something).

skin brooder = a fish in which the eggs are attached to the belly, e.g. certain South American catfishes.

skin slime disease = costiasis (an infection of the skin, fins and gills of aquarium and hatchery fish by the flagellate protozoan *Costia* sp. (or *Ichthyobodo*; and also *Chilodonella*, *Trichodina*). Found in young fish just as they start feeding externally, in colder waters. Stress may be a factor. Fish may show lethargy, appetite loss, flashing, respiratory distress in the form of gill flaring and gasping, fin erosion, and produce abundant mucus, giving a cloudy appearance, hence the names blue slime disease or skin slime disease. The skin and scales may peel away in strips in acute cases).

skinless fish = fish or fish fillets without the skin attached. Also called skinned fish.

skinned fish = skinless fish.

skinner = 1) fish Skinner (a ridged roller to remove fish skin and scales. There are small hand-operated models for sport fishermen and hand-operated or powered models for skinning fish on a commercial scale (no pun intended)).

skinner = 2) the person in a fish plant who removes the skin in preparing cod fillets.

skinning = the process of removing fish skin.

skipped spawning = sexually mature fish that do not spawn every year. The reasons vary but usually relate to poor conditions. However the reason can be increased food availability which is then used for growth, as well as decreased food availability not providing enough energy for egg growth. The condition is seen early in life, in those fish that spawned in the previous year(s), when fishing mortality at spawning grounds was high, when natural mortality at feeding grounds was low, and when the cost of migration was too high in terms of mortality and energy requirements.

skirlie = oatmeal, chopped onions and fish livers fried in fat in a pan (Scottish dialect). Also spelled skirly.

skirly = skirlie.

skirt = 1) a rubber or vinyl addition to a fishing lure that give action and texture.

skirt = 2) the vertical wall or side of a cod trap.

skirt-shaped = said of structures distally broadened like a skirt, e.g. internasal flaps of some rays.

skirted spool = a spool on a fishing reel allowing for greater line capacity and protection of the internal reel mechanism from salt and water.

skittering = use of a cane pole (*q.v.*) to swing a spoon or pork rind among lily pads or other vegetation where it moved rapidly, or skittered, over the surface.

skiver (noun) = 1) a skewer such as a forked stick on which fish strung through the gills or impaled for carrying (Newfoundland).

skiver (noun) = 2) the load of trout carried on a skiver.

skiver (verb) = 2) to pierce or impale such as bait on a hook or stringing trout (Newfoundland).

skiver line = a rope with wire hangers used for landing fish when a boat is prevented from coming alongside the dock (Newfoundland).

skoomer = a hand net comprised of a circular frame on a long pole used for scooping salmon out of a fly-net or for catching herring spilling out of a drift net (Scottish dialect).

skow = a barge-like vessel used to purchase fish from larger ships on busy fishing grounds.

skrae = scrae.

skrea = scrae.

skrei = the Arcto-Norwegian or north-east Arctic stock of Atlantic cod (*Gadus morhua*), currently the world's largest stock. The Norwegian term means "the wanderer" and is used to separate this stock from the non-migrating coastal cod.

skriggled cod = shredded cod (small pickle cured cod reduced to small dried fibres in a machine. Drying is at 65.5°C. Also called fibred or flaked cod).

skull = 1) the cartilages and bones associated with the brain, sense organs (smell, sight, hearing), mouth and gills, collectively the syncranium. The parts associated with protection and support for the brain and sense organs are called the neurocranium and dermocranum (both *q.v.*) and the parts supporting the anterior digestive system and the respiratory apparatus are

called the splanchnocranum or viscerocranum (*q.v.*). Cartilage elements in the skull are called the chondrocranium and bony elements the osteocranum.

skull = 2) variant spelling of scull (1 and 5).

skunked = said of angler who fails to catch a fish.

skute = scute.

skuvie = the tail of a large fish, e.g. a flatfish (Scottish dialect).

sky pond = a pond filled by rainwater and therefore seasonal.

SL = abbreviation for standard length.

SI = abbreviation for standard length.

sl = abbreviation for standard length.

slab = slab-sided.

slab rubble = rubble (76-305 mm diameter stones) of relatively flat shape.

slab-sided = a fish with a compressed body, oval in cross section with flattened sides.

slack = 1) a stream in a valley (Viking).

slack = 2) fish that are scarce or slow in appearing (Newfoundland).

slack ice = ice covering five-tenths to eight-tenths of the water surface. Also called broken ice, loose ice, loose pack ice, open ice, open pack ice.

slack line = the loose line from the rod tip to the lure; may be line on the water surface or simply the bow formed by line weight from rod tip to float or lure.

slack salted = light salted (cured fish with only small amounts of salt used, fish have 20-30% salt on a dry basis. Also called light cure).

slack tide = the period at high or low tide when there is no visible flow of water.

slack water = 1) the period at high or low tide when there is no visible flow of water.

slack water = 2) an area in a sea or river unaffected by currents; still water.

slack salted fish = light cure (fish such as cod and other white fishes cured with small amounts of salt (16-20 parts per 100 fish, fish contains 20-30% salt on a dry basis) or left in salt for short periods (3-5 days)).

slackled fish = frozen fish that have been thawed or refreshed (U.S.A.).

slack out = slack fish.

slaip = slap.

slap = a gap in a weir to allow fish to swim upriver to spawning grounds (Scottish dialect). A Saturday's slap allowed fish to pass from Saturday night to Monday morning. Also spelled slop, slopp, sloppe, slope, sloip, sloap, sloop>, sclope, slapp, salppe, slape and slaip.

slape = slap.

slapp = slap.

slash = a cut made in the abdominal wall enabling the viscera to drain in fish preparation.

slat = 1) spent salmon, a salmon that just spawned.

slat = 2) removing a hook from a fish with a quick skilled jerk (Newfoundland).

slat trap = a trap for catfish used in Louisiana of varying form but made of slats.

slate = a piece of slate set at an angle in an aquarium is used by certain fish species for spawning.

slatting = violent shaking or flapping, a term used in the past for unhooking a mackerel in a commercial fishery.

slaughter house = an area on a longliner where the fish catch is sorted and dressed and where hooks are re-baited (Nova Scotia).

sleep with the fishes = dead, killed, assassinated, drowned.

sleeper goldfish = upside down goldfish (*Carassius auratus* with a swimbladder or intestinal infection, once valued in China as the shui yu).

sleeping sickness = a disease of fishes caused by a unicellular parasite. The fish lie on their side, breathe slowly and move little for weeks.

sledge = trawl head (a strong, heart-shaped iron frame fitted at each end of a trawl beam to raise it about one metre off the sea bed. The after side is straight and slopes upward of each head to stake the ropes or wires by which the trawl is towed. The sides of the net are seized or lashed at a point close to the ground. Also called head iron and sledge).

slew = slough (1, 2 and 3).

slice = a broad knife for lifting and dividing fish at a table.

slick = 1) bass (*Micropterus* spp., Centrarchidae) too short to meet tournament standards; usually less than 14 inches (ca. 36 cm). Also called baby, dink, throw back, nubbin, and pop corn.

slick = 2) a surface indication of fish feeding below, comprising oil, faecal matter and fish fragments, e.g. a feeding school of bluefish (*Pomatomus saltatrix*) causes a slick.

slick = 3) run (transitional segments of streams, between a riffle and a pool, with moderate to fast current and depth, little or no turbulence and a smooth water surface).

slicker = a lead weight incorporated into the hook, used in hand-lining for cod near the surface. It enables the hook to be sunk rapidly (Newfoundland).

slide = an inclined structure of box-like shape set in a stream at a ripple or small waterfall to catch descending fish.

slider = a means of fishing with a float in deep water as it is difficult to cast out a float with a line below it longer than the fishing rod. The float has a large eye at the bottom and slides readily along the line until it is halted by a stop knot or rubber stopper set where the float will operate at the required depth. When casting, the float is down near the hook and slides up the line once in the water. The float may have a hole through its middle for the line to run freely through. Known as slip bobber or sliding float rig in North America.

sliding float rig = slider.

slime = 1) a natural covering of fish forming a protective film, often damaged or lost when captured fish are handled with dry hands, leaving the fish open to infection when returned to the water. On death the slime becomes opaque and milky, and yellowish with time.

slime = 2) microbial colonies on under-salted white fish evidenced by a sticky feel and by smell.

slime = 3) to remove loose skin and blood from mild cured fillets.

slime = 4) moisture on the surface of salted cod caused by imperfect drying.

slime coat = slime (1).

slime line = the commercial fish processing line where fish are gutted.

slime pore = one of a long series of pores along the flank of Myxinidae which produce large amounts of slime used in defense or in suffocating other fishes.

slime-food = marine plant and animal organisms fed on by fish (Newfoundland).

slimer = a worker who processes fish, cleaning, gutting and sorting them.

sling = backstrop (a short wire or chain system between the otter board and bridle on an otter trawl. Also called backboard becket, backstrop, board bridle, board leg, board strop, door legs and door strop).

sling rock = a rock used to sink a net.

slinger = a spent salmon or a thin cod out of condition (Scottish dialect).

slink = 1) white fish, such as cod, with an unacceptably high water content.

slink = 2) spent fish (1).

slink = 3) a salmon still in fresh water after spawning or a thin salmon in poor condition.

slink = 4) a thin cod, one caught in the spring before summer feeding in coastal waters (Newfoundland).

slip = stern ramp.

slip bobber = slider.

slip sinker = a lead or other metal weight having a hole through its centre, sliding freely up and down the fishing line. Called running lead in Britain.

slippery as an eel = 1) an idiom, sliding from one's grasp as easily as an eel (which has an elongate, muscular body, no firm protrusions to grasp, small scales and a slimy skin, making it difficult to hold).

slippery as an eel = 2) a good negotiator not easily pinned down on a commitment.

slippery as an eel = 3) of a person, too smart and sly to be trustworthy.

slippery dick = 1) a wrasse, *Halichoeres bivittatus*.

slippery dick = 2) a shooter containing Bailey's Irish Cream and Amaretto (or other ingredients), shaken with ice and strained into a shot glass.

slippery dick = 3) a name used for various politicians (see slippery as an eel).

slipping = releasing fish from a net, particularly from a purse seine without bringing the fish on board.

slipping clutch = drag (a device in the mechanism of fishing reels that puts pressure on the line as it is pulled off the reel, allowing a hooked fish to pull line without breaking it, and to restrain a running fish).

sliver (noun) = 1) a small thin piece cut, split or broken off, as in a piece of fish cut off as bait.

sliver (verb) = 2) to cut into slivers.

slivering = the act of cutting off a slender piece, e.g. in preparing bait.

sloap = slap.

slob = a brook trout (*Salvelinus fontinalis*) living in estuaries in Labrador.

sloch = the membrane covering the intestines of fish (Scottish dialect). Also spelled slowch, sluch and slough.

slocum = slowcome.

sloip = slap.

sloonky = said lean and emaciated fish (Scottish dialect).

sloop = slap.

slop = 1) a cod which is split, washed, heavily salted and undried (Newfoundland).

slop = 2) slob.

slope = 1) a major region from a drainage divide to the sea, e.g. the Pacific slope.

slope = 2) the slope seaward from the shelf edge to the beginning of a continental rise or where there is a general reduction in slope.

slope = 3) slap.

slopp = slap.

sloppe = slap.

slot = a Shetland Isles dish comprising fish livers and roe made into a paste with flour or oatmeal, and then boiled and fried.

slot limit = a limit on the size of fish that may be kept under a minimum and over a maximum size, but not those inbetween. This prevents small fish being caught and protects medium to large-sized spawning fish but allows trophy fish to be caught by anglers.

slott = slot.

slough = 1) a swampy or marshy area, sometimes with a sluggish flow, sometimes isolated from flowing water. May (swamp) or may not have trees growing out of it. Pronounced to rhyme with slew.

slough = 2) a tidal channel in a salt marsh. Pronounced to rhyme with slew.

slough = 3) a marine bay. Pronounced to rhyme with slew.

slough = 4) a piece of dead tissue separated from a wound or inflamed surface. Pronounced to rhyme with tough.

slough = 5) the process of separating tissue from a wound or inflamed surface. Pronounced to rhyme with tough.

slough = 6) sloch.

slow roll = a spinnerbait retrieved slowly through and over cover.

slowch = sloch.

slowcome = a small cod, not large enough to split (Newfoundland).

slub = 1) the deposit resulting from salt reactions with the mucus of fish during curing. Slub is assessed from clean to poorly washed in commercial products.

slub = 2) deposits of slime and mucus from marine organisms, or seaweeds, on fish nets.

slubby = covered with fish slime.

sluch = sloch.

slue = slough (1, 2 and 3).

sluice = a structure for impounding the water of a river or canal with a sluice gate controlling the water volume.

sluice gate = a structure in a watercourse for regulating the inflow or outflow of water.

sluiceway = an artificial channel fed or controlled by a sluice.

slumry = said of fish in poor condition or spent after spawning; lean (Scottish dialect).

slumping = the act of salmon throwing themselves into the air in aimless and noisy jumps (Scottish dialect).

slunker = spawned-out sturgeon.

slurp gun = a device for collecting fishes and other organisms in water, consisting of a cylinder with a plunger. Retraction of the plunger creates a sudden suction or slurp of water, pulling the fish unharmed into the cylinder which can then be capped. The gun has to be quite close to the fish to work.

slush bait = a topwater plug with a flat or pointed head.

smack = a fishing boat sailing under various rigs, according to size, and often having a well used to transport the fish catch to market.

small = various grades of dried and salted cod (Newfoundland).

small fish = fish, such as haddock, whiting, flounders, mackerel and herring, etc. caught inshore by smaller boats in comparison with large deep-sea fish, such as cod, ling, skate, halibut, etc. caught by the larger boats further out to sea (Scotland).

small fries = plural of small fry but not commonly in use; more likely to mean small French-fried potatoes.

small fry = 1) young or small fish.

small fry = 2) children, from Harriet Beecher Stowe's *Uncle Tom's Cabin*. See also fry.

small fry = 3) any insignificant person, group or thing.

small lines = lighter longline gear used in shallow water for the smaller species. May have 1200 hooks.

small pit organ = sense organs found in the epidermis. See also superficial neuromasts, canal neuromasts and large pit organs.

small-scale fishery = artisanal fishery (a fishery involving skilled but non-industrialized operators; typically a small-scale, decentralized operation; normally a subsistence fishery although sometimes the catch may be sold. Usually fishing trips are short and inshore and fishing vessels are small but in developed countries may apply to trawlers, seiners or longliners). Limits of small and large scale fisheries vary between countries and fisheries. Also called small-scale producer.

small-scale producer = small-scale fishery.

small sportfisherman = an inshore-offshore fishing boat of aluminium or fibreglass, up to 25 feet in length, with an inboard or outboard motor. Used by anglers for access to relatively distant fishing grounds but slow enough for trolling.

smeak = smeek.

smeect = smeek.

smeek = to smoke fish in order to cure or preserve them (Scottish dialect). Also spelled smeect, smeak, smeik and smick.

smeik = smeek.

smell = the characteristic odour of fish on the hands can be removed by rubbing them on stainless steel (or carefully on a knife in the field).

smells fishy = dishonesty in a situation or explanation. From fresh fish having practically no smell, while rotten ones do.

smelter = a fisher for smelt (Osmeridae, or generally small silvery fishes).

smelting = fishing for smelt (Osmeridae) through the ice.

smeowt = smowt.

smick = smeek.

Smith Butchering Machine = a machine used in canneries to remove the head, fins and guts of fish. Also called iron chink.

smoat = smowt.

smoke dip = liquid smoke (a spay or dip formed from a condensate of the components of wood smoke, used to impart a smoky flavour to fish. Also called smoke dip, smoke solution).

smoke drying = use of hot smoky air (wood smoke, *q.v.*) from burning wood to dry fish for preservation. Wood, wood chips, wood shavings or sawdust is used and the smoke depends on the type of wood, its water content, temperature attained and the manner in which it is heated.

smoke flavour = natural or synthetic chemicals used to impart a smoky flavour to fish.

smoke house = smokehouse.

smoke solution = liquid smoke (a spay or dip formed from a condensate of the components of wood smoke, used to impart a smoky flavour to fish. Also called smoke dip, smoke solution).

smoked fish = fish cured by being exposed to smoke from slowly burning wood, often in a special smoke house, using particular woods. Partly dries the fish and imparts a smoky flavour.

smoked salmon = whole gutted salmon, split down the back (kippered salmon) or fillets, brined or dry salted, dried and cold smoked for several hours to give a mild cure. Usually sliced for retail and sold fresh, frozen, semi-preserved or canned in oil.

smoked trout = a pinkish-grey, proprietary, paint colour, similar to dead salmon, *q.v.*

smokehouse = a small structure or shed used for smoke drying.

smokeless smoking = artificial smoking (adding colour and flavour to a fish product resembling that of naturally smoked fish).

smoker = 1) smokehouse.

smoker = 2) the deepsea hydrothermal vent emitting heated, mineral-rich water; has a unique associated invertebrate fauna and various fishes. Usually called black smoker.

smoker = 3) a fast strike from a large fish causing the reel to "smoke" as it pulls out much line.

smokie = headed, gutted and hot smoked small haddock.

smoking kiln = smokehouse.

smolt (noun) = a young salmonid which has developed silvery coloring on its sides, obscuring the parr marks, and which is about to migrate or has just migrated into the sea.

smolt (verb) = to undergo the transformation from parr to smolt.

smolt up = smoltification.

smolt window = the short period when salmonid smolts can be transferred safely from fresh to sea water.

smoltification = the process of transforming from a parr to a smolt. The functioning of the gills and kidneys must be reversed. The process is also called smoltify.

smoltify = smoltification.

smoot = smowt.

smooth = a surface without projections.

smothered = entangled and killed in a net (Newfoundland).

smoult = smowt.

smout = smowt.

smowt = a young salmon or smolt (Scottish dialect). Also spelled smowte, smeowt, smout, smoat, smoot and smoult.

smowte = smowt.

snaar = a wooden pin, notched in the middle where a string was attached, slack at one end with a loop by which the baited hook was kept in hanging position. This loop easily slipped off at a touch and the pointed ends of the pin would then stick across the mouth of the fish (Scottish dialect). Also spelled snar, snarr, snaara, snarl, snarel and snarle.

snaara = snaar.

snaara pin = snaar.

snae = said of fish ready to take a bait (Scottish dialect). Also spelled sney, sne, snei and sny.

snag = any structure in the water which can catch up a lure, e.g. a sunken tree.

snag line = a wire attached to otter boards dragged ahead of a trawl to catch any obstructions and prevent loss or damage to the main net.

snagging = catching fish by means of unbaited hooks strung on lines. The fish swim into the hooks and are caught on them. Usually illegal. May also refer to inadvertent snagging when sport fishing with a bait or lure, the fish being hooked on some body part outside the mouth.

snaggletooth = having teeth not in alignment with neighbouring ones, or liable to catch on irregularities, e.g. in *Silurus triostegus*.

snake = 1) a steelhead salmon returning to the ocean. Also called downer.

snake = 2) a pink rubber worm, used in angling.

snake bite = a form of fishing line used by anglers that has a soft, braided inner material covered with a more rigid, anti-tangle coating that is easily cast. Another type is called snake skin.

snake guide = one of the smaller guides through which the line runs along a fly rod, so-called because of their s-shape.

snake skin = see snake bite.

snake trolling = using a boat in a controlled fashion to troll a lure in a weaving pattern, imparting an erratic action to the lure to avoid spooking shallow fish. Also called zigzagging.

snakehead = 1) a member of the family Channidae.

snakehead = 2) a member of a Chinese gang involved in smuggling people from China into western countries.

Snakehead Terror = a 2004 movie starring Bruce Boxleitner where snakeheads, affected by human growth hormones dumped in the local lake to revive the fisheries (how?), attack the residents of a small town. The snakeheads even move out onto land.

snap clip = a brass or stainless steel clip with the end bent to lock it when closed to facilitate easy changing of hooks, lures, leaders or sinkers. It may have a swivel.

snap freezing = flash freezing (very rapid freezing of small pieces of fish).

snap net = a net with a hinge or folding wings that can be closed abruptly when a fish enters.

snap netting = a single wall of netting with a floating head rope and a weighted ground rope, designed to suspend between two boats and into which the catch is drawn. Used in Ireland.

snap swivel = a swivel allowing rotation without twisting a fishing line and having a snap, a bent wire which can be locked and unlocked from a metal groove for attachment of lures.

snap-jigging = rip-jigging (jigging in areas with thick vegetation. The jig is allowed to settle in the weeds and then a strong pull rips the jig through them, cutting the weeds, and the process repeated).

snapper = 1) Cape Island vessel (a speedy fishing vessel, 32-45 feet long (and up to 57 feet), carrying a crew of two, of carvel construction with an inboard engine amidships and a shelter forward. Used for herring and groundfish gillnetting, inshore longlining, shallow water stern trawling, herring pumping and trolling).

snapper = 2) a successful fisherman (Newfoundland).

snappie = a small cod.

snappy = snappie.

snar = snaar.

snare = 1) a running noose on the end of a pole that can be used to catch a fish. It may be passive with the fish's movements causing the snare to close or more usually it is actively used when fish in shallow water, such as on spawning grounds, have a snare slipped over their head and pulled tight. The snare may be baited or run through a hollow stick (stick-snare).

snare = 2) snaar.

snarel = snaar.

snaring = active use of a snare.

snarl = snaar.

snarle = snaar.

snarr = snaar.

snatching = snagging.

sne = snae.

sneak spawner = sneaky male.

sneaker = sneaky male.

sneaky male = a small, non-dominant male fish which attempts to fertilise eggs by darting suddenly onto the nest site. Also called sneaker or sneak spawner.

snee = an inclination of fish to take a bait (Scottish dialect).

sneet = snit.

snei = snae.

snell = the North American word for the British hooklength (the line directly attached to a hook. Usually of lower breaking strain than the main line so that the fish will not break off a long length of line and become entangled).

snelling = the process of attaching a leader to a spade end hook. Eyed hooks can also be snelled, the knot being very strong, and gang rigs (*q.v.*) are snelled. A series of loops are made around the shank over a single loop laid parallel to the shank, the end of the line is fed through the single loop and the loop drawn tight so the series of loops clamp down on the single loop.

sney = snae.

snig = 1) slang for a small eel.

snig = 2) a small freshwater tomcod (*Microgadus tomcod*) (Newfoundland).

snigger = catching salmon illegally by dragging a cluster of weighted hooks along a river bed or through a pool (Scottish dialect).

sniggling = a method of capturing eels using a gorge (q.v.) in France and England. A needle is buried in the earthworm bait used in this technique.

snit = a small and insignificant object, e.g. a small cod (Scottish dialect). See also snitt and sneet.

snitt = snit.

snood = a short line connecting a fishing line with the hook.

snorkel survey = a method using by divers with snorkels to estimate fish abundance, especially spawning fish.

snorkie = a salmon infected with a fungus (Scottish dialect).

snout = the tip of the head in front of the eyes.

snout length = the distance from the front tip of the head to the front edge of the orbit.

snout organ = an innervated group of cells in a round capsule at the end of a jelly-filled tube opening to the skin surface of Gymnarchidae and Mormyridae; electric sense organ. Also called mormyromast or multicellular gland.

snow = marine snow (organic particles and dead organisms that sink into the deep sea where they form a basis for life without sunlight).

snowman rig = in angling, a method of mounting two boilies, q.v., one above the other and thus resembling a snowman.

snub = a cod with a rounded, elongate and upturned snout, believed to be a sign of good luck (Newfoundland).

snubby = snub.

sny = snae.

snye = 1) a meandering side channel of a river with a dead end.

snye = 2) a channel joining two rivers.

snye = 3) a side-channel that later rejoins the main river.

so = soe.

So = a photophore below the middle of the eye and above the jaw in Myctophidae.

SO = 1) supraorbital canal.

SO = 2) a photophore near the tip of the lower jaw.

so help me salmon = an oath (obsolete). See also by (the) salmon.

soak = 1) a bait or trap fishing for some time to catch fish.

soak = 2) to haul a net using the slow roll of the boat as leverage (Newfoundland).

soak time = the total time a baited hook, net or trap is available to fish in the water.

soam = soom.

soap fish = or saippuakala in Finnish, spoiled lutefisk (*q.v.*) left too long in the lye, allowing saponification to occur.

soboro = boiled, shredded and dried fish (Japan).

social constraints = behaviours of fishers or a local community which constrains entry to a fishery.

sockeye salmon virus = infectious haematopoietic necrosis (an acute Rhabdovirus-group viral disease of salmonids transmitted from fish to fish and by eggs in western North America, e.g. in chinook and sockeye salmon and rainbow trout. The disease destroys the haemopoietic tissues in the kidney and spleen. Fish become lethargic or hyperactive, dark in colour, develop popeyes, anaemia (pale gills) and a swollen belly, and produce faecal casts. Haemorrhages on the skin, viscera and fins occur. Particularly affects fish less than 5 cm long in water below 10°C with high mortality. Potentially dangerous to humans. Abbreviated as IHN).

sodium merthiolate = a disinfectant for living fish eggs. The sodium salt of ((o-Carboxyphenyl)thio)ethylmercury. Also called thimerosal.

sodium tripolyphosphate = an additive used on fish to retain moisture. Abbreviated as STP.

soe = bait, such as half-boiled and chewed limpets or other shellfish, which are thrown or spat into the sea to attract fish (Shetland Isles dialect). Also spelled so and sow (2).

soft bait = any lure made from soft rubber or plastic.

soft cure = salted fish, such as cod, with a moisture content after drying over 40%.

soft egg disease = flaccid, easily deformed, incubating eggs. Caused by microorganisms forming holes in the egg from which yolk leaks. Also called soft shell disease.

soft ray = an articulated or segmented fin ray, simple or branched.

soft release = in stocking or introducing fishes to a new habitat, the fish are acclimated at the release site to temperature and chemistry, allowed to recover from transport, to develop social bonds, etc., cf. hard release.

soft roe = the milt or sperm of a fish as food. Also called white roe.

soft shell disease = soft egg disease.

soft water = water with a low concentration of dissolved calcium and magnesium salts.

soft-finned = having a fin supported by flexible or jointed rays.

soft-rayed = a group of fishes distinguished from the spiny-rayed fishes (Acanthopterygii) by lacking true spines in the dorsal, anal and pelvic fins, among other characters. Includes herrings, carps, eels, etc. Once known scientifically as the Malacopterygii a term not now in general use. A convenient designation for those lower fishes lacking spines.

soldier's fish-hook = grenade; a means of mechanical narcosis, q.v.

sole = 1) the elongate forward-projecting flattening on the underside of the abdomen of *Opisthoproctus* (Opisthoproctidae). May act as a reflector for the light organ inside the body near the anus. Also called sole reflecting organ.

sole = 2) the common name for certain unrelated flatfishes belonging to such families as the Pleuronectidae and Soleidae. The word is from the Latin for sandal and refers to the flat shape of these fishes.

stole = 3) the bottom rope of a fish net (Scottish dialect).

sole plate = a steel plate on the bottom of an otter board or the trawl head of a beam trawl.

sole reflecting organ = sole.

solitary = living alone, not in schools.

Solomon Gundy = herring or anchovies pickled in vinegar, white sugar and sometimes pickling spice and bay leaves, layered with onion rings in a large bottle. May also be a mixture of minced veal, chicken or turkey, onions and a fish component. The term is derived from *salgama condita*, Latin for preserved pickles or from the Countess Salmagondi, a lady of honour to Maria de Medici, said to have invented it. See also salmagundi.

solum nasi = the floor of the nasal passage, particularly when ossified. In Actinopterygii it gives rise to an orbitonasal lamina articulating with the palatine.

solutotype = a joke term in nomenclature for a specimen kept in a liquid with very high or low pH such that it dissolved.

somactid = radial (a bony or cartilaginous support for a fin ray or spine. Usually three - the proximal, middle and distal radials. If the proximal radial is notably larger it is spoken of as a basal. Teleosts have only one row of radials between the fin rays and the supporting skeleton and these are called actinosts).

somite = a body segment. In the embryo an undifferentiated mesodermal component of an early trunk or tail segment or metamere, derived from paraxial mesoderm. The somite forms the myotome, sclerotome and perhaps dermatome.

sonar = use of transmitted and deflected sound waves under water to detect objects, including fish schools.

sonic hedgehog = a gene controlling eye and mouth formation, e.g. in the blind form of the fish *Astyanax mexicanus*, this gene and another, tiggy-winkle hedgehog, are expressed in larger region of the body than in sighted fish, preventing normal eye development. Eyes are lost as a more effective mouth is developed for catching food in the dark. Not to be confused with the computer game.

sonic muscles = muscles associated with the swimbladder used for sound production. See extrinsic and intrinsic sonic muscles, and drumming muscles, elastic spring mechanism and protractor post-temporalis mechanism.

sonic scattering = sound scattering layer.

soniferous = sound producing; many fishes produce sounds under water.

sonification = act of producing sound.

sono-buoy = an attachment to a pound net that transmits the underwater noises made by trapped fish, enabling a remote estimate of catch, quantity and kind.

sook - souk.

sooked = half-dried fish (Orkneys).

soom = the swimbladder of a fish, used as food (Scottish dialect). See also soam, soum and sum.

sooshler = soosler.

soosler = a thin fish, especially a cod in poor condition (Caithness dialect, Scotland). See also Also sooshler, sousler, sooslin.

sooslin = soosler.

sorting grid = a grid inserted into a shrimp trawl to allow shrimps to fall back into the cod-end but diverting many fish to an escape panel in the top of the trawl.

souk = the young of cod (Scottish dialect).

soum = soom.

sound = 1) gas bladder (a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Composed of three layers, the tunica externa, the submucosa or middle layer and the tunica interna, all q.v. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, sound receptor, respiratory organ. Found in Actinopterygii. Often lacking in bottom fishes. Sometimes called swim bladder or air bladder, less appropriate terms. An item in Chinese cuisine. Used to make isinglass, q.v.).

sound = 2) a long and wide body of water connecting larger water bodies and between the mainland and islands, larger than a strait or channel.

sound = 3) to measure the depth of water by means of a weighted line.

sound as a roach = quite sound or solid; a pun based on the roach (*Rutilus rutilus*, Cyprinidae) and the French roche or rock.

sound as a trout = of good and sound constitution.

sound production = see sonic muscles and eructation.

sound scattering layer = any layer or object which scatters sound in water. Sonar devices can be used to detect fish schools by recording sound scattering layers.

sound-bone = the vertebral column to which the sound is attached, possibly just the anterior vertebral column (Newfoundland).

sounding = 1) a measured depth of water.

sounding = 2) testing the depth of a water body or the quality of the bottom.

sounding line = a weighted line or wire used in sounding.

soup = fish soup is any soup made from fish with seasonings and vegetables.

soup and fish = 1) evening or formal dress.

soup and fish = 2) a formal, white-tie dinner (nineteenth century America).

sour fish = 1) a partially decomposed fish that smells sour.

sour fish = 2) fish kept until it acquires a game flavour.

source = 1) a spring, the beginning of a stream.

source = 2) any water body from which water is taken for a given purpose.

source = 3) areas where birth rates exceed death rates and emigration rates are higher than immigration rates as applied to equilibrium populations. See also sink.

souse = to plunge into or soak in a liquid.

soused = cooking of fish in salt, vinegar or lemon juice with herbs and spices for seasoning.

soused herring = potted herring (herring pickled with salt, vinegar and spices. Often as rolled fillets baked in an oven and sometimes sprayed with kipper dye after cooking).

soused gurnet = a term of opprobrium (from gurnard).

sousler = soosler.

sow = 1) a boat-based fish wheel (*q.v.*), found on the Columbia River in Oregon.

sow = 2) soe.

sp. (spp. plural) = species (singular and plural); used after the generic name when the species identity is not known

*sp. ind.* = *species indeterminata* (an indeterminate species; one which cannot be recognized from its original description).

*sp. indet.* = *species indeterminata* (an indeterminate species; one which cannot be recognized from its original description).

*sp. n.* = *species nova* (new species; given after the scientific name instead of the authority (who as author of the article is assumed to be the authority)).

*sp. nov.* = *species nova* (new species; given after the scientific name instead of the authority (who as author of the article is assumed to be the authority)).

*sp. rev.* = abbreviation for *species revivisco*, meaning species revived, e.g. from an earlier synonymy.

SPA = abbreviation for sequential population analysis.

space cadet = a strain of zebrafish (*Danio rerio*) that turns towards a prodding needle or spins on the spot, rather than swimming away. This strain has abnormal connections between nerves feeding into the Mauthner neurons, *q.v.*, at the rear of the brain. There are also spaced out and twitch twice strains.

space suit for a fish = definition of a human.

spaced out = a strain of zebrafish; see space cadet.

spacer = a small bobbin, *q.v.*, inserted between the main bobbins along a groundrope.

spatiotemporal = existing in both space and time together. Also spelled spatiotemporal.

spadate = spade-shaped.

spade-end hook = hooks without an eye but having a flattened end requiring whipping or snelling, *q.v.*, to attach the line. These hooks are usually the smaller sizes, 16 and below.

spaghetti trawl = rope trawl (the netting of the front part of a four-seam trawl made of plaited warps running parallel for a few meters. The aim is to save energy required for towing by decreasing the resistance of the gear).

spail (noun) = 1) a wooden skewer used to stretch open a fish for drying (Scottish dialect).

spail (verb) = 2) using a spail (Scottish dialect).

spalding = 1) spelding.

spalding = 2) a dried fish split open.

spale = spail.

span board = a board fastened across the centre of a fish barrow to strengthen the surface on which the load is carried (Newfoundland).

span line = a rope running from the main buoy to the leader of a cod trap (Newfoundland).

Spanish = a grade of dried and salted cod prepared for the markets of Spain and Portugal (Newfoundland).

Spanish fish = Spanish.

Spanish room = a tract of land on the water-front of a cove or harbour from which the fishery was prosecuted by Spaniards in Newfoundland.

Spanish water dog = similar to the Portuguese water dog, a dog used to retrieve fish and fallen articles from the water, to carry messages between boats and to guard boats. Used from about 1500 A.D. onward. Now used for bomb and drug sniffing.

sparganosis = infestation of a fish with the larval stage of a pseudophyllidean cestode. spat = the spawn or larval stage of oysters or other molluscs; occasionally used for fish spawn when adhering to objects.

spate = a heavy rainstorm, excessive runoff, a sudden flood.

spathiform = resembling a spar (rounded pole) in form.

spatial closure = a permanent or seasonal ban on fishing in a defined area.

spatial heterogeneity = the non-homogeneous nature of habitats or spatial distributions of organisms, often ignored in simple models.

spatiform = presumably meaning spatulate, in reference to branchiostegals, but not in any dictionary.

spatio-temporal = spatiotemporal.

spatiotemporal = existing in both space and time together. Also spelled spaciotemporal.

spatulate = spoon-shaped, depressed and concave.

spawn (noun) = the eggs of fishes (and other aquatic organisms).

spawn (verb) = to lay (and fertilize) eggs in the process of reproduction.

spawn bag = fish eggs used as bait for such species as Pacific salmons, enclosed in a mesh bag to keep the eggs together. Also called roe bag.

spawn binding = said of aquarium fish with ripe eggs that fail to spawn through lack of a male, incorrect environment, etc. Eggs may be shed, reabsorbed or decay and cause bacterial infection.

spawn herring = mature herring migrating inshore to spawn (Newfoundland).

spawned out = fish that have completed spawning, shed eggs or sperm, and are now in an exhausted or depleted state.

spawner = a female fish, especially at spawning time.

spawner trap = a barrier erected in a stream or in a fish ladder intended to divert adult fish holding prior to taking their eggs or sperm for culturing.

spawner-recruit relationship = the number of young fish or recruits entering a population is related to the number of parents or spawners.

spawner-to-spawner ratio = an estimate of the number of spawners in one generation produced by the previous generation of spawners. A spawner-to-spawner ratio of 1.0 indicates that, on average, each spawner produced one offspring that survived to spawn.

spawnie git = lucky person (Scottish slang).

spawning = release of ova, fertilised or to be fertilised.

spawning area = part of the bottom on which fish spawning takes place.

spawning biomass = the total weight of all sexually mature fish in a population.

spawning bottom = part of the bottom suitable for fish reproduction. Also called breeding bottom.

spawning box = a box filled with gravel and submerged in a stream or lake providing a substrate for fish eggs to be deposited.

spawning can = a container in which mature catfish are placed to spawn.

spawning channel = an artificial gravel-bed area in which flow, depth and velocity are controlled at ideal levels for spawning by a particular species of fish.

spawning check or mark = a ring on a scale cutting through the annuli, caused by erosion of the edge of the scale during spawning.

spawning colour = the pigmentation that develops during spawning. Also called breeding colour.

spawning dress = spawning colour.

spawning escapement = the total number of adult fish returning to a hatchery or stream to spawn.

spawning fishery = a fishery targeted on knowledge of the fishes spawning habits or grounds.

spawning ground = the locality in which a given species spawns. Also called breeding ground.

spawning habit = usual manner of spawning characteristic of a given species.

spawning livery = spawning colour.

spawning migration = the movement of fishes from feeding or overwintering areas to the spawning area.

spawning mop = an artificial, aquarium spawning medium for those fishes that deposit or scatter adhesive eggs in or over vegetation; consists of a mass of synthetic yarn tied into various configurations. See also floating (or top) mop, bottom mop and trailing mop.

spawning period = a defined time period when spawning occurs.

spawning place = the exact locality where fish spawn. Also called breeding place.

spawning platform = a floating or suspended platform in a lake used by fish for spawning

spawning pond = a small pond specially designed for natural spawning by brood fish in aquaculture. Also called breeding pond.

spawning population = the mature part of a stock or population, especially during the spawning season.

spawning potential ratio = the number of eggs that could be produced by an average recruit in a fished stock under a given regime divided by the number of eggs that could be produced by an average recruit in an unfished stock. This may also be expressed as the spawning stock biomass per recruit (SSB/R) of a fished stock divided by the SSB/R of the stock before it was fished. Abbreviated as SPR. Also called percentage maximum spawning potential or %MSP.

spawning ropes = unwound ropes tied together and weighted and used as a removable spawning substrate in ponds.

spawning rush = a rapid burst of swimming, usually vertical or steeply inclined, that culminates in the release of gametes at its apex, followed by a rapid return to the substrate or aggregation.

spawning season = that period of a year in which fish are sexually active. Also called breeding season.

spawning spread = the time between start and end of spawning when spawn is released over days and weeks rather than all at once.

spawning stock = the mature part of the stock that is able to spawn; the number or biomass of all fish beyond the age or size class in which 50% of the individuals are mature. Also called adult stock.

spawning stock biomass = the total weight of the fish in a stock that are old enough to spawn; the biomass of all fish beyond the age or size class in which 50% of the individuals are mature. Generally used for females only. May be used instead of measuring egg production. Abbreviated as SSB.

spawning stock biomass per recruit = the spawning stock biomass divided by the number of recruits to the stock. It is the expected lifetime contribution to the spawning stock biomass for a recruit of a specific age, e.g. per age 2 individual. Abbreviated as SSB/R.

spawning substrate = the bottom type required by a fish for spawning.

spawning survey = counts of redds and fish carcasses to estimate spawner escapement and identify habitat being used by spawning fish. Annual surveys can be used to compare the relative magnitude of spawning activity between years.

spawning tile = a piece of hard and flat material such as a pottery tile, plastic or glass intended as an area for fish to deposit their eggs in aquaria. Rocks may also be used as in nature.

spawning time = that portion of the spawning period when the fish actually spawn.

spawning trigger = an environmental cue or change which stimulates a fish to spawn. Often temperature (increase or decrease) but can be a salinity change, increase in food supply, water level or daylength. Some fish do not have triggers, breeding continuously or only at a certain point in their life cycle.

spear = 1) a fish spear often has 2-7 prongs on the end in various arrangements used to capture fish. Often barbed. Many variants and impromptu structures exist. See also narsoo.

spear = 2) bite (the straight part after the bend on a hook, q.v.).

spear gun = any explosive propelled spear used to catch larger fishes, e.g. swordfishes.

spearfishing = using a spear to catch fish. The spear is propelled by hand, by a spring, elastic band, compressed air or a bow. Spearfishing is usually restricted to certain species and a licence is required.

spearing = using a spear to catch fish.

spec. = abbreviation for specimen.

specialist = a fish harvester with one license directing all efforts towards one species.

speciation = the evolution of species.

species (singular and plural) = biologically, a group of populations of actually or potentially interbreeding organisms which are reproductively isolated (by behavior, ecology, morphology or physiology) from other such groups. Historically, a cohesive lineage of ancestral-descendent populations of organisms that maintains its identity from other such lineages. Taxonomically, the name of a category of organisms below the genus-group; an individual taxon of the category "species", e.g. *Perca fluviatilis*. Morphologically, the smallest group of animals that can always be separated (+95% of the specimens or all of the specimens) from other such groups by morphological characters (other than sex or individual genes) – does not include sibling species. A species is a subjective unit insofar as it is based on only a sample of the population and insofar as the point of separation where there is some overlap must be arbitrary. Abbreviated as sp. (singular) spp. (plural). A nominal species is a named species, objectively defined by its type-specimen.

species aggregate = a group of species that are morphologically similar and therefore difficult to identify.

species assemblage = group of species co-occurring in a given area and likely to be caught together in a given gear.

species epithet = the second part of a scientific name after the genus.

species flock = concentration of large numbers of distinct but related species in an isolated area, e.g. Cichlidae in African Great Lakes.

species group = group of species considered together, often because they are difficult to differentiate without detailed examination, e.g. very similar species, or because data for the separate species are not available, e.g. in fishery statistics or commercial categories.

*species indeterminata* = an indeterminate species; one which cannot be recognized from its original description. Abbreviate as *sp. indet.* or *sp. ind.*

*species inquirenda* = a doubtfully identified species needing further investigation, a species incompletely defined that requires further clarification. Also called *species inquirendum*.

species name = specific name.

*species nova* = new species; given after the scientific name instead of the authority (who as author of the article is assumed to be the authority). Abbreviated as *sp. nov.* or *sp. n.*

species richness = number of species in a given area or habitat.

species risk group = in food inspection, a group of fish species with common risks related to environmental contaminants, therapeutic residues, histamine production, marine toxins and /or sanitary water quality conditions.

species selection = species selectivity.

species selectivity = the way fishing gear is designed to catch a particular species or a limited number of species of fish.

species tank = an aquarium in which only one species is kept.

species-group = 1) the co-ordinate categories species and subspecies (superspecies and infrasubspecific forms, although used by some taxonomists, are not recognized by the International Code of Zoological Nomenclature).

species-group = 2) a group of closely related species, a superspecies in some usages.

species-rich = speciose.

specific action potentiality = the state of an animal responsible for its readiness to perform the behavior patterns of one instinct in preference to all other behavior patterns; level of motivation. Abbreviated s.a.p.

specific growth rate = a term used in aquaculture to estimate the production of fish after a certain period (weight at harvest - weight at stocking)/production period\*100.

specific name = the second component of the binomial name of a species. When a species is placed in a given genus, the combination of the generic name and the specific name forms a binomen. A specific name has no meaning in nomenclature when cited in isolation.

specifier = a species, taxon or apomorphy that anchors a name in a phylogenetic definition.

specimen = 1) an individual from a scientific sample; sometimes an individual regarded as typical of the group.

specimen = 2) any large individual of a species, used by anglers in Britain to describe sought after fish; called trophy or lunker in North America.

speciose = having many species, species-rich, usually applied to a taxon.

specious = having deceptive attraction or allure; having a false look of truth or genuineness. Often misused for speciose.

Speckfisch = a trade name for hot-smoked pieces of sixgill shark, *Hexanchus griseus*, in Germany.

spectacle = a transparent membrane covering the eye. Petromyzontidae have a primary spectacle that is an unattached modification of the cornea while other fishes may have a secondary spectacle formed from skin originally fused to the cornea and subsequently separated. The secondary spectacle is found in fish that live in habitats with abrasive substrates or in fish with protruding eyes that require some streamlining.

speed = swimming speed in fish is divided into cruising, sustained or prolonged, and burst or darting speeds (all q.v.).

speed trolling = trolling a lure behind a boat moving quickly (20 m.p.h.); used for fast-swimming marine fishes, for example.

speet = 1) a pointed stick or skewer on which herring or other fish are strung up to dry (British dialect).

speet = 2) a horizontal iron rod through a sinker from which the hooked lines hang down on either side (Scottish dialect).

speet = 3) a pole on which fish lines are hung (Scottish dialect).

speetler = a young eel (Scottish dialect).

spelaean = pertaining to a cave.

spelean = pertaining to a cave.

spelder = a person who splits fish for curing.

spelding = 1) headed, gutted split fish such as whiting (*Merlangius merlangus*) immersed in weak brine (even seawater) and air dried.

spelding = 2) a dried fish split open.

speleic = pertaining to a cave.

speleifer = a cave-tolerant organism.

spelk (noun) = 1) a wooden skewer used on a split fish hung up to dry, especially on a young dogfish (Scottish dialect).

spelk (verb) = 2) to skewer a split fish and keep it open for quicker drying (Scottish dialect).

spelling, original = the spelling of an available name when first published. The original spelling of a name is to be kept as the "correct original spelling" unless it does not meet the requirements of the International Code of Zoological Nomenclature. An incorrect original

spelling is an original spelling that is incorrect. Multiple original spellings are two or more different original spellings for the same name.

spelling, subsequent = see subsequent spelling.

spelling, variant = different spellings of specific or subspecific names that are deemed to be identical for the purposes of the Principle of Homonymy.

speleophil = 1) a reproductive guild (*q.v.*) in which a few, large adhesive eggs are hidden in crevices in caves. There is extensive embryonic respiratory plexuses and the emerging larvae are large, e.g. *Astyanax mexicanus*.

speleophil = 2) a reproductive guild (*q.v.*) including cavity roof nesters with moderately developed embryonic respiratory structures, e.g. *Pimephales notatus*, and bottom burrow nesters having strongly developed embryonic respiratory structures, e.g. *Acarichthys heckeli*.

spent fish = 1) a fish which has recently completed spawning. Fat content and general condition is usually low. Most fish caught on spawning migrations are caught before they are spent.

spent fish = 2) live fish with a flesh fat content less than 2%. Also called lean fish.

spent-wing = a type of dry fly with wings at right angles to the shank suggesting a dead mayfly. Various named patterns come under this heading.

sperm competition = occurs when a male sneaks into a nest to fertilise eggs of a mating pair.

sperm packet = spermatophore.

sperm parasite = a fish that has all-female forms dependent on sperm from other species to stimulate egg development without a genetic contribution.

sperm sac = in male sharks, sperm descend through the ductus deferens and the seminal vesicle into a sperm sac.

sperm sinus = a space which develops within the wall of the gonad near the genital veins and which feeds into the sperm duct.

spermary = the male equivalent of ovary; probably more commonly used for invertebrates than fish.

spermatic artery = runs from the coeliaco-mesenteric artery to the left testis and from the gastric artery to the right testis.

spermatic crypt = the more or less spherical space in the male tissue of hermaphroditic Serranidae, in which the sperm develops. The crypts are surrounded by connective tissue membranes that break down when the sperm reach maturity.

spermatation = sperm production.

spermatogonia = precursors of sperm.

spermatophore = a cluster of sperm surrounded by a capsule. The capsule can be deposited into the female and fertilisation can then occur long after this mating.

sperm packet = a mass of sperm transferred from the male to the female by a gonopodium of the Poeciliidae.

spermatozeugmata = packaged sperm found in Goodeidae and Poeciliidae.

spermozeugma = sperm held in large masses by a mucoid substance as in Neostethidae.

spermatozoa = the flagellated male gamete or sperm.

spey = a fly casting technique using a two-handed rod and a modified roll cast, named after the Scottish river where it was developed.

sphenoid = a region of the skull lying between the ethmoid and otic regions made up of the orbitosphenoid, basisphenoid and, in various groups, the alisphenoid, and mesethmoid.

sphenotic = a deep bone below the frontal, above the pterosphenoid (or alisphenoid) and under the dermosphenotic. Also called autosphenotic.

sphenotic spine = a projection of the sphenotic bone seen in some Lophiiformes.

spheroidine = tetrodotoxin, *q.v.*, the poison found in tetrodotoxic fishes.

spice cure = curing fish with salt to which spices have been added.

spider web bait = a thick ball of spider webs used to catch gar fish that are entangled by their small teeth.

spider web net = formed by a New Guinea spider. A long piece of bamboo is bent over at the end to form a loop and placed in an area where the spiders are common. The spiders spin their web over this loop. The resulting net can be used to scoop up fish of about one pound in weight.

spicule = minute, hard, needle-like or sharp-pointed processes or projections.

spiced cured fish = fish cured with salt to which is added sugar and various spices.

spider = a wet or dry fly with long hackles, falling lightly to the water surface (and so good for novice casters) and riding high and resembling many insects. Most effective on glassy water.

spider hitch = a knot used by anglers to produce a loop. Used mostly with lines over 15 kg test. Various websites have animated steps showing how to tie this knot.

spider jig = in angling, a soft plastic grub with a skirt or tentacles at the forward end.

spider weight = a lead weight with copper wire legs. Used by surf fishermen to anchor their bait, the legs digging into the sand.

spiesman = high spy (a salmon fisher posted to keep watch on the movements of fish in a river (Scottish dialect)).

spillånga = dried ling (*Molva molva*), headed, and most parts of the backbone removed. The ling is stretched by means of splints before it is hung for drying (Sweden).

spiller = a long and stout fishing line with many hooks attached. May be up to 500 feet with 60 hooks baited with pilchards or mackerel. Also called boulter.

spillet fishing = a series of hooks on snoods set along one line. Also called spilliard fishing, trawl fishing or bultow fishing. See also boulter, spiller, trot line, longline, etc.

spilliard fishing = a series of hooks on snoods set along one line. Also called spillet fishing, trawl fishing or bultow fishing. See also boulter, spiller, trot line, longline, etc.

spillover = movement of adults from a protected area to fishing grounds or larval export from a protected area to surrounding areas.

spillway = passage for overflow of surplus water, e.g. from a dam.

spin casting reel = an angling reel in which the spool is fixed. A bail arm is folded back to let the line come off in a cast and when in place rotates to wrap the line on the spool, cf. bait casting reel. Also called fixed-spool reel.

spin fishing = sport fishing with a lure that rotates on the end of the line as retrieved; often a swivel is used to prevent the line becoming twisted. The reel used has a fixed spool and a bail wire loops retrieved line onto it. The reel hangs below the rod which is fitted with large guides. Also called spinning.

spina (plural spinæ) = spine.

spina pterotica (plural spinæ pteroticæ) = pterotic spine (a pointed process of the pterotic bone).

spinæ = plural of spina.

spinæ pteroticæ = plural of spina pterotica.

spinal nerve = a series of paired nerves emerging from the spinal cord via vertebral foramina with dorsal and ventral roots and variously innervating body structures, e.g. the first three spinal nerves innervate the pectoral and pelvic girdle muscles; the first spinal nerve innervates the back of the cranium via a dorsal or occipital branch and the hyoid muscles via a ventro-anterior branch.

spinate = spine-like or composed of spines.

spincaster = fishing with a reel having an enclosed face using a push button to release the line (which peels off a stationary drum), mounted on the topside of a baitcasting rod. A favourite of beginning anglers. Called coffee grinder in slang.

spindle = dan leno spindle (a steel spindle through a dan leno bobbin, *q.v.* Also called axle).

spine (fins) = a usually stiff, sharp, dermal rod which supports and or arms the fin; spinous ray. Lacks segments and is not laterally paired as are rays. Spine counts are given in Roman numerals, e.g. XI-XIV. See also ray.

spine (body) = sharp hard bony structures on the skeleton or skin, e.g. preopercular spines. Both serve as predator deterrents.

spine length = spines are measured from their distal tip (excluding filaments) to their base).

spinescent = tending towards the form of a spine, e.g. in the gill rakers of Gempylidae and Trichiuridae.

spiniform = having the shape of a spine.

spinner = 1) a lure consisting of a wire shaft with a hook(s) and a blade that spins when pulled through the water. Variously coloured and decorated with feathers, fur, beads and plastic additions. Also called spinnerbait.

spinner = 2) the last stage of a mayfly after mating which falls on the water surface with wings spread horizontally, an easy target for feeding fish.

spinner bait = a weighted hook and spinning blade with the hook surrounded by a rubber skirt. It fishes point up and so is suitable for fishing in heavy vegetation.

spinner fall = a feeding frenzy of fish caused by spinners, *q.v.*, falling on the water surface.

spinning = spin fishing.

spinning reel = spin casting reel.

spinoid scale = a cycloid scale bearing a serrated margin; superficially similar to ctenoid scales but having spines as outgrowths of the scale as oppose to true ctenii.

spinous = stiff or composed of spines.

spinous scale = a specialised larval scale with spines (not ctenii, *q.v.*).

spinule = a small spine projecting from a larger spine.

spinulose = covered with small spines.

spiny-finned = fish bearing fins with one or more spines.

spiny-rayed = spiny-finned.

spiny-rayed fishes = a natural group of fishes (Acanthopterygii) characterised by spiny rays at the front of the dorsal, anal and pelvic fins. They also have ctenoid scales (*q.v.*). These "higher" fishes contrast with the "lower" soft-rayed fishes that lack spines.

spiracle = a vestigial gill cleft between the eye and the gill slits in Elasmobranchii, Acipenseridae, Polyodontidae, and Polypteridae. Water for respiration is inhaled through the spiracles in Rajiformes. Connects with the gill cavity; often retains branchial lamellae which are called the spiracular pseudobranch.

spiral valve = a spiral or helical fold in the midgut of Petromyzontiformes, Elasmobranchii, Holocephali and some primitive Teleostomi. Functions to increase the surface area for processing food without lengthening the intestine.

spirit of wine = ethanol ( $C_2H_5OH$ ; used as a 70-80% solution in water for the permanent preservation and storage of fish specimens in museum collections. Also called ethyl alcohol or grain alcohol).

spiritotype = a joke term in nomenclature for a specimen stored in spirits for so long that it is almost invisible (cleared) in the jar.

spirits = spirit of wine.

spit = 1) a narrow strip of land projecting into the sea.

spit = 2) a frothy secretion enclosing the eggs deposited by an insect on a drying cod (Newfoundland).

spitchcock = grilled, fried or roasted eels, cut into small pieces or split lengthwise and flattened, with breadcrumbs and herbs.

spitotype = a joke term in nomenclature for a type described to irritate a colleague or rival.

splake = an artificial hybrid of male brook trout (*Salvelinus fontinalis*) and female lake trout (*S. namaycush*). The name comes from speckled trout (an older name for brook trout) and lake trout. Also called wendigo, a name decided on by a contest sponsored by the Carling Conservation Club. Introduced to many waters in North America, particularly in Ontario where they mature earlier than lake trout and before lampreys become a significant scourge.

splanchnocrania = plural of splanchnocranum.

splanchnocranum (plural splanchnocrania) = the portion of the skull derived from the visceral arches and composed of endochondral bone and cartilage. Also called viscerocranum.

splash fishing = use of a splash net.

splash net = any net into which fish are driven or led by frightening them. The water surface may be thrashed with sticks, boat sides struck, water splashed, etc. Also called lam net.

splash netting = use of a splash net.

splashless tank = a fish-carrying system based on a petrol or gas tanker with over 1000 litre capacity, foam-lined to prevent fish injury, an air compressor and emergency oxygen supply.

splated = a fifteenth century word for dressing pike (preparing this fish for consumption), no longer in use.

splaved = a fifteenth century word for dressing bream (preparing this fish for consumption), no longer in use.

spleen = an elongate element of the viscera lying on the posterior dorsal surface of the fundic part of the stomach, concerned with production and maintenance of blood cells. Deep red, almost black, in colour in teleosts.

splenial = 1) a dermal bone carrying a sensory canal, e.g. in *Amia*. Also called sesamoid angular or submandibular.

splenial = 2) coronoid (a paired dermal bone bearing teeth located on the upper edge of Meckel's cartilage. One pair is found in *Acipenseridae* and two pairs in *Amia* and *Lepisosteus*. Also called presplenial, prearticular and intradentary).

splenial = 3) coronomeckelian (a small bone on the postero-lateral part of Meckel's cartilage of the lower jaw. Often a point of insertion of the adductor mandibulae muscle. Also called sesamoid angular, supraangular, sesamoid articular, articular sesamoid, os meckeli or *d* bone).

splenic artery = a branch of the end of the coeliac artery serving the spleen.

splenic vein = delivers blood from the spleen and adjacent parts of the stomach to the hepatic portal vein.

splint = a rudimentary spine.

split = 1) check (a mark or discontinuity on a scale or other hard structure used for aging, caused by cessation of growth and absorption of deposited material due to spawning (hence a spawning check), injury, disease, parasites, or unseasonal lack of food).

split = 2) fish with head and guts removed and backbone cut around, opened and flattened for salting and drying.

split cane rod = a fly rod made of six pieces of split bamboo, triangular in section and tapered, and glued together. Mostly replaced by fibre and graphite rods.

split cure herring = herring in Newfoundland that have been split down the back, the head is retained but the gills and guts removed, lightly brined and packed in salt in barrels for a week, then repacked in 100° brine.

split fish = fish cut open from the throat to the vent or to the tail, gills, guts and gonads removed, head left attached or removed, backbone removed or left in the tail region for support.

split ring = double zone (two rings on an otolith that are close together relative to the size of the calcified stricture and the distance between two annuli. Considered as one annulus). Also called double ring and double mark.

split shot = a ball of lead of varying sizes with a slit in it allowing the shot to be clamped onto a line. Used to weight a fishing line such that the hook and bait sink rapidly or are positioned appropriately in the water column. The smallest size is number 13 and goes up to swan shot, the largest. Lead shot is banned in some countries because of its poisonous nature for wildlife.

splitter = 1) a scientist who engages in splitting (1).

splitter = 2) member of a fishing crew who cuts out the backbone of the cod and opens the fish to the tail for salting and drying.

splitting = 1) separating species on minor differences. The converse is lumping.

splitting = 2) often carried out before salting or drying, a gutted fish is cut partly through exposing some or all of the backbone, with the head on or off. There are various commercial grades of splitting from well split to very poorly split, depending on whether the backbone was removed entirely, whether belly flaps are entire or not, and split tails or round tails, gill covers, cartilage, slivers, skull bones present in varying degrees.

splitting knife = a sharp curved knife used in splitting (2).

splitting stage = a small stage, *q.v.*, where fish were gutted, headed and split before salting.

splitting table = a table in a stage, *q.v.*, where cod or salmon are processed before salting and drying in Newfoundland. The table is about 4 feet by 6 feet and has 1-2 semi-circular cutouts where the splitters processed the fish, the cutout allowing the fish to be worked at an angle as the backbone was removed. Next to the cutouts is a cleat, or small strip of wood, used to steady the fish as it was being split.

splunge = an implement for catching eels (United Kingdom).

splunger = a technique used to catch eels (probably spearing but not specified in source).

spm = abbreviation for specimen.

spobby = an activity not active enough to be called a sport but too competitive to be called a hobby (slang). Angling falls into to this definition.

spodge hook = a stick with a hook on the end, used to catch large catfish in Kentucky.

spoilage = rendering fish unfit for human consumption through the actions of bacteria, moulds, yeasts, etc. Odour, flavour, appearance and texture may be affected. Temperature affects

spoilage rate. Fish with a natural low pH like tunas spoil more slowly than demersal fish. Off-flavours produced by hydrolysis and oxidation of oils in fatty fish are strictly not spoilage.

sponge filter = an aquarium filter providing both mechanical and biological filtration. It consists of a large foam rubber block connected to a lift tube or small power head. Water is drawn through the sponge, which removes small particles and grows bacteria for the nitrogen cycle, *q.v.*

spongivore = sponge eating, e.g. the Lake Tanganyika cichlid *Chalinochromis brichardi*.

spook = 1) alarming a fish so that it swims away and cannot be observed or caught.

spook = 2) a topwater lure shaped like a cigar.

spool = the central, circular part of a fishing reel on which the line is wound.

spool knot = a knot for tying line to the spool of a reel.

spoon = a lure that is spoon-shaped, with a hook(s) at one end, and that is cast out and retrieved in sport fishing. It flutters when drawn through the water. Numerous sizes, shapes and colours available.

spoon due = the right of the public hangman to take a ladleful of salt or fish from baskets in the public market (Scottish dialect).

spoon hook = spoon.

spoon net = dip-net (a bag-shaped net held open by a square or rounded frame on the end of a long pole. Used to scoop fish from the water, either on small scale in streams or ponds or commercially from large catches).

spoonplug = in angling, a flattened plug, rather like an elongate spoon in shape often brightly coloured with eyes painted on the top anteriorly near the attachment eye and with a triple hook at the opposite end. Retrieves at a constant depth.

spootcher = spoucher.

sporadic fishes = fishes which live and breed indifferently in salt or fresh water or which enter fresh water only sporadically and not as part of a true migration, e.g. many Lutjanidae and Sciaenidae; probably many Mugilidae; *Poecilia, Mollienisia*.

sport = a morph within a species appearing randomly.

sport fish = the objective of sport fishing.

sport fishing = catching fish for sport or food, using rod-and-line, lures, flies or baited hooks. Sometimes restricted to catching fish purely for sport, *cf.* angling, and not for any monetary gain, although tournaments offer prizes and some sport fishers make a living from their ability to catch large fishes consistently. See also recreational fishery.

sporting fish = the objective of sport fishing.

spot = 1) a well-defined circular or sub-circular mark or pigment.

spot = 2) a school of fish.

spot = 3) a shoal frequented by fish.

spot pest = a disease of cyprinids of uncertain origin.

spotter = a person on a fishing boat assigned to looking out for marine mammals caught in gear and assisting their escape.

spotter plane = a plane used to locate schools of fish.

spoucher = a wooden scoop with a long handle used in lifting fish from a net (Scottish dialect). Also spelled spootcher and spuidsear.

spp. = abbreviation for species (in the plural).

SPR = spawning potential ratio ( the number of eggs that could be produced by an average recruit in a fished stock under a given regime divided by the number of eggs that could be produced by an average recruit in an unfished stock. This may also be expressed as the spawning stock biomass per recruit (SSB/R) of a fished stock divided by the SSB/R of the stock before it was fished. Also called percentage maximum spawning potential or %MSP).

sprag = spragg.

spragg = an English term for cod about 63-76 cm long.

sprat = 1) the European sprat, *Sprattus sprattus* (Clupeidae) often sold as brislings.

sprat = 2) slang for spurious coinage such as sixpences, shillings and four-penny pieces in Britain.

sprat = 3) slang for a sweetheart (Britain).

sprat = 4) slang for personal effects or furniture, usually used in the plural (Britain).

sprat = 5) slang for an undersized, mean-looking boy or man (Britain).

sprat = 6) slang for a scarecrow (Britain).

spread = 1) the horizontal opening of a trawl net (rather than its vertical height).

spread = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for sticklebacks.

spread = 3) to lay fish (usually split and salted cod) out on flakes or racks for drying by sun and wind, turning them occasionally.

spreader = 1) an ice-fishing minnow rig comprising a lead weight and two or more single hooks.

spreader = 2) wooden poles used for spreading and separating certain parts of fishing nets.

spreader bar = butterfly (an L-shaped steel plate shackled between the dan leno spindle and legs. Also called arm, banana, boomerang, dan leno arm, dan leno bracket, dan leno spreader, devil's elbow).

spreading = a quantity of split and salted cod sufficient to cover a given drying area.

spreading wire = leg (one of the wires or chains connecting the net to the dan leno, bridle or otter boards in a trawl).

spreadline = end rope (a line connecting the end of the first or last section of a longline backrope or string to the dan line (all q.v.). Also called back of line, dumb string, longline, dummy, end tow and lud tow).

spreitzer vertebra = a unique type of anterior caudal vertebrae in which the haemal arch is not closed; the open haemal arches of the first 2-3 caudal vertebrae allowing the expansion of the abdominal cavity posteriorly into the caudal peduncle, especially in adults with swollen gonads. Found in *Ammocrypta* (Percidae) and named for August Edward Spreitzer who was the first person to report on this type of vertebra (John C. Bruner, pers comm., 2004).

sprickle = sprikkle.

sprikkel = sprikkle.

sprikkl = sprikkle.

sprikkle = to wriggle, struggle and thrash about, especially said of fish when removed from the water (Scottish dialect). Also spelled sprickle, sprikkel, sprikkl, sprikkl and sprikle.

sprikkl = sprikkle.

sprikle = sprikkle.

spring = 1) an outflow of water from the ground.

spring = 2) the season characterised by increasing water temperatures and longer photoperiods, usually March to May in the northern hemisphere.

spring baiting = 1) the quantity of frozen bait fish taken aboard a vessel in spring for use in one trawl fishing trip (Newfoundland).

spring baiting = 2) a fishing voyage to the Newfoundland Banks, the length of which is fixed by the supply of bait aboard.

spring breakup = thawing of ice on rivers and lakes in spring.

spring creek = a stream that derives its water from a ground flow or spring source, having a temperature not as affected by the surface conditions, being cooler in summer and warmer in winter.

spring current = see spring tide.

spring hole = a small area in a lake or river where spring water emerges.

spring overturn = mixing of lake waters in spring through melting of ice cover, warming of surface waters, convection currents and wind action.

spring race = non-anadromous migratory or sedentary stocks that start a spawning migration in spring. See also winter race.

spring range = the average semi-diurnal range occurring at the time of spring tides. Larger than the mean range where the type of tide is either semi-diurnal or mixed and of no practical significance where the tide is diurnal.

spring run = anadromous fish that migrate to fresh water in spring, spawning in late summer or early fall.

spring runoff = snow melt causing water levels to rise in streams and rivers.

spring tide = a tide that occurs at or near the time of a new or full moon when the sun and moon are in line and gravitational forces have greatest effect, and which rises highest and falls lowest from the mean sea level.

spring trip = the first fishing expedition on the offshore banks of Newfoundland.

spring viraemia = an acute haemorrhagic viral infection with a rhabdovirus of Cyprinidae, in particular of cultured *Cyprinus carpio*, usually appearing in spring. Symptoms include loss of coordination and equilibrium, popeyes, swollen belly, inflamed and swollen vent, and oedema and haemorrhages of various organs. Also called infectious dropsy.

spring-angle = a slender piece of wood such as bamboo with pointed ends, bent in an arch with the points bound together. The points are covered with bait or the bait lies between the points. The binding loosens when the bait is swallowed and the arch straightens out to embed the points in the throat. Also called spring-gorge.

spring-gorge = spring-angle.

springtip = a bite indicator used in legering (*q.v.*). It screws into the tip ring of a rod and is made of a length of rod-like plastic on a short spring, deflecting when the fish pulls on the line.

spritsail yard = to disable a useless or predatory fish by thrusting a piece of wood through its gills.

sproat = a hook characterised by a gently angled bend with a straight point.

sprole = sprool.

sproll = sprool.

spong (noun) = 1) a long pole with one or two tines used in transferring cod from boat to stage (Newfoundland).

spong (verb) = 2) to use a spong.

sprool = a short length of wire or whale-bone set through a lead sinker of a hand fishing line enabling having hooks to be attached at either end. Also spelled sprole, sproll, spruell and sprule.

sprot = to pull hard on a fishing line, then releasing it quickly, so it springs free of an obstruction (Scottish dialect).

spruell = sprool.

sprule = sprool.

spud = a long-handled chisel used to make ice holes for fishing.

spudger = a long-handled pole used in stirring fish being cured in brine.

spuidsear = spoucher.

spur and groove = a system of shallow ridges, or spurs, separated by deep channels, or grooves, oriented perpendicular to the reef crest and extending down the upper seaward slope.

spurious parasite = a false parasite, an organism mistaken for a parasite.

spurt (noun) = 1) a sudden appearance of fish or school formation in inshore waters, or the fish themselves (Newfoundland).

spurt (verb) = 2) to appear or school as a spurt (1).

spy bucket = a glass-bottomed container for viewing fish underwater.

spy glass = spy bucket.

spy-hopping = lifting the head out of the water to look around, e.g. the great white shark.

sqm = abbreviation for scales counted along the side of the body as if in a lateral line, from the Latin *squama* for scale. See lateral series scales.

squalene = a low specific gravity hydrocarbon found in the livers of squaloid sharks and used in cosmetics, lipsticks, hair-setting preparations, moisturizers and lubricants for fine machinery.

squama (plural squamæ) = scale.

squama ctenoidea (plural squamæ ctenoideæ) = ctenoid scale (a scale having small spines (ctenii) on the posterior exposed portion and which hence feel rough when stroked towards the head. Typical of many Teleostei).

squama cycloidea (plural squamæ cycloideæ) = cycloid scale (a smooth-edged round or oval scale composed of acellular dermal bone lacking small spines on the posterior exposed edge. Typical of many Teleostei. Some cycloid scales may have a serrated margin and are then termed spinoid scales).

squama ganoidea (plural squamæ ganoideæ) = ganoid scale (a non-overlapping or partially-overlapping scale, often rhomboidal in shape, with thick outer ganoine layer (enamel-like substance), a middle layer of dentine and an inner dermal, cosmine bony layer. Grows by addition of material above and below, e.g. in Lepisosteidae, Amiidae and Polypteridae. Lepisosteidae have lost the dentine layer. The scales of Lepisosteidae are called lepisosteoid scales as distinct from paleoniscoid scales of Brachiopterygii).

squama linea lateralis (plural squamæ lineæ lateralis) = lateral line scale.

squamæ = plural of squama.

squamæ ctenoideæ = plural of squama ctenoidea.

squamæ cycloideæ = plural of squama cycloidea.

squamæ ganoideæ = plural of squama ganoidea.

squamæ lineæ lateralis = plural of squama linea lateralis.

squamation = the arrangement of scales; scalation.

squamatology = the study of scales.

squamosal = a paired endochondral bone found in *Latimeria* but incorporated in the preopercle of modern Actinopterygii. Also a term misapplied to the pterotic in fishes.

squamose = covered with or made up of scales.

squamous = 1) flat, as in a cell layer (as opposed to cuboidal and columnar).

squamous = 2) a suture with scale-like and overlapping margins.

squamous = 3) squamosal.

squamous = 4) adjective for squama (scale); possessing scales.

squamula = a small scale.

square = a top canopy extending forward from the opening of a trawl to prevent fish from rising up and escaping over the top of the net.

square bill = in angling, a type of crankbait with a small square diving bill used in areas with many snags.

square brackets ([....]) = 1) placed around a word or phrase to clarify a quotation taken out of context.

square brackets ([....]) = 2) in a citation in a bibliography used to indicate an author originally anonymous or to indicate the date was not given in the work or differs from the one given.

square brackets ([....]) = 3) placed around the epithet of a superspecies in the citation of an allospecies (*q.v.*).

square mesh = netting tends to assume a diamond shape and even close under tension but modern technology can make netting that retains a square shape and thus fishes better.

square net = a net used to catch gaspereau (*Alosa pseudoharengus*, Clupeidae) in Maritime Canada rivers as they migrate to spawn. A fence is built about one-third across a river to create suitable water conditions. A large square net is laid on the river bed and is attached to a cantilevered pole. When a shoal of fish passes over the net, the observing fisherman puts his weight on the far end of the pole, lifting the net out of the water, the pole end being secured by a hook. Fish are removed with a dip-net and packed in barrels of salt.

squatter = a migratory Newfoundland fisherman who moved to the coast of Labrador and carried out a summer fishery from a shore base.

squaw net = a small gill net anchored to a pole on shore and a pole in the water.

squawfish = common name for cyprinids of the genus *Ptychocheilus*, changed to pikeminnow so as not to violate the tenets of good taste. Curiously, though offensive for centuries, its origin is the Algonquian "squa", young woman or wife. See also jewfish.

squeem = the motion of a fish as detected by its effects on the water surface, including its shadow (Scottish dialect).

squid = to fish with squid as bait , or to catch squid for use as bait (Newfoundland).

SSB = spawning stock biomass ( the total weight of the fish in a stock that are old enough to spawn; the biomass of all fish beyond the age or size class in which 50% of the individuals are mature. May be used instead of measuring egg production).

SSB/R = spawning stock biomass per recruit (the spawning stock biomass divided by the number of recruits to the stock. It is the expected lifetime contribution to the spawning stock biomass for a recruit of a specific age, e.g. per age 2 individual).

ssp. = abbreviation for one subspecies.

sspp. = abbreviation for more than one subspecies.

SSR = abbreviation for stock recruitment relationship.

ST = abbreviation for supratemporal canal.

st. = abbreviation for status, meaning rank.

St. Anthony of Padua = lived 1195-1231, a Franciscan monk, who preached to a school of fishes, which listened attentively.

St. Neots's fish = a church in Cornwall has a stained glass window illustrating the story of this saint. Three fish swam in a sacred pool and the saint had heavenly permission to take one at a time, with the understanding that the supply would never fail. When the saint was ill, a follower Barius took two fish from the pool, either from laziness or in attempt to succour his master. He boiled one and baked the other. The saint was most upset and used bad language it is averred but since this was in Cornish the content is unclear. He ordered his acolyte to return the fish to the pond where they rapidly revived despite being cooked. One fish being removed and fed to the saint, he rapidly revived.

St Peter's fish = the John dory or *Zeus faber*, so named because of the prominent pigment spots where reputedly Saint Peter picked it up and left his fingerprints (ichthyogeographically unlikely). See also St. Peter's mark and the devil's thumb print.

St. Peter's mark = a dark blotch on the anterior flank above the pectoral fin of the haddock, *Melanogrammus aeglefinus*. Also called the devil's thumb print.

St. Peter's spot = a pigment blotch near the rear of the dorsal fin in juvenile *Sarotherodon galilaeus*, a tilapia, from Lake Galilee. Supposedly the thumb mark of St. Peter where he picked up the fish and removed a piece of money from its mouth. Actually correlates with schooling behaviour seen in young but reduced in adults, as is the spot.

stab = a half-grown cod (Scottish dialect).

stab net = a balloon gill net used in deep water.

stabber = along pole with a nail in the end used to spear fish in shallow water (Newfoundland).

stability = the consistent use of common names for fishes as opposed to scientific names that can change as understanding of relationships change (but see squawfish above).

stablin = a well-grown, half-sized cod (Shetland Isles dialect).

stabblin = stablin.

stacking lures = fishing more than one lure at different depths using one rod and a downrigger, q.v.

stadia = stages, e.g. of a glacial period.

staff net = stake net.

stage = a fishing stage is a shed near the shore or built out over the water for landing, cleaning, salting and storing fish in Newfoundland. It contained a splitting table, tools, fishing gear, etc.

stage door = the entrance to a fishing stage from the land.

stage head = the part of a stage extending over the water where fish are landed (Newfoundland).

stage work = all the operations involved in landing and processing fish for salting and drying (Newfoundland).

staging = 1) in angling, a term referring to seasonal movements when fish will concentrate at certain points, such as drop-offs, before dispersing into shallower or deeper water.

staging = 2) the time period a fish spends at the mouth of a tributary stream which it plans to ascend and spawn in.

stagnant = water standing still as in a pool. Often implies a low oxygen content and an unsuitable environment for fishes.

stagnation = a water body where no mixing of water masses occurs.

stain = a discoloration of water after heavy rain or due to turbulence.

stake bed = an artificial fish habitat of stakes driven into a lake bed before it fills or at low water or the stakes are attached to a weighted frame and lowered into place.

stake gill net = a gill net hanging from poles or stakes in estuaries and shallow bays. Also called fixed gillnet, set gill net.

stake hang = circle of stakes about 6 feet high forced into the sea bed used for trapping salmon and other fish (English dialect).

stake net = 1) a gill net hung on stakes, a stake gill net, often in tidal waters.

stake net = 2) a pound net, weir or bag net supported by stakes.

stale = stel.

stale dry fish = gutted fish, fermented and then sun-dried (Myanmar).

stalefish = a skateboard trick where the skateboarder grabs the heel edge with his back hand, behind his back leg.

stalked eye = an eye carried on the end of a stalk or peduncle.

stamps = fish are popular organisms on postage stamps as an internet will show.

stanck = stank.

stancke = stank.

stand of tide = an interval at high or low water when there is no discernable change in height of the tide.

standard = a quality of dried and salted cod (Newfoundland).

standard environmental temperature = a specified temperature at which the standard metabolic rate of a fish is determined.

standard length = the measurement from the most anterior tip of the body to the midlateral posterior edge of the hypural plate (in fish with a hypural plate) or to the posterior end of the vertebral column (in fish lacking hypural plates). It may be restricted to the tip of the snout if the lower jaw projects. The base of the caudal fin (end of the vertebral column or posterior edge of the hypural plate) is determined by flexing the tail up while the caudal peduncle is held down. The resultant wrinkle or caudal flexure indicates the caudal base. It may also be determined by probing or dissection. Sometimes the posteriormost point is the last scale, the last pored scale or the beginning of the caudal fin rays. It is the usual scientific measurement for length of a fish except in Amphioxo, Myxini, Petromyzontiformes, Elasmobranchii and Holocephali. This measurement is used because long-preserved fish often lose the tips of the caudal fin rays through breakage after the desiccation effect of alcohol. See total length and fork length. In Holocephali the length is usually taken from the tip of the snout to the origin of the upper caudal fin because the caudal filament breaks off frequently. In Scaridae it is taken back to the rear margin of the second to last lateral line scale {because the large scales obscure the point of caudal flexure. Abbreviated as SL, sl or SI.

standard metabolic rate = the metabolic rate as determined at the standard environmental temperature or when using the minimum amount of oxygen per unit time per unit of body weight.

standard oxygen consumption = the oxygen consumed when a fish is at rest and undisturbed.

standard weight = the 75th percentile of the weights of a given species within specified length increments. Abbreviated as  $W_s$ . See also relative weight.

standardised = quantities adjusted to a standard, e.g. catch-per-unit-effort is standardised to remove the effect of factors that are known not to be related to abundance.

standing = an obsolete term for the nomenclatural status of a name.

standing crop = the amount of living material per unit area or volume; may be expressed as grams of carbon, total dry weight, and so on.

standing end = the short area at the end of the standing part of the line.

Standing Fishes Bible = an 1806 edition of the Bible had "And it shall come to pass that the fishes shall stand upon it...", fishes being a misprint for fishers (Ezekiel, 48:10).

standing flake = a platform built on poles and spread with boughs for drying cod In Newfoundland.

standing net = a fish net in a fixed location, e.g. for salmon in rivers.

standing part = the main part of an angling line that is fixed and under tension such as that part of the line on the reel.

standing stock = biomass; weight of a stock. May apply to a part of the stock such as spawning fish, fish in a particular area or at a particular time.

standing the gaff = enduring goading, a hoax or trick. From hooking a fish when gaff meant a large hook.

standing water = water in a lake, pond, marsh, etc. that does not flow.

standup tackle = a short rod and heavy reel hooked to a harness worn by the angler.

stang = 1) a spiked pole used for catching eels (United Kingdom).

stang = 2) stank.

stangeon = gangen (a branch line with a hook, attached to a main line. Also called tom).

stank = 1) a pond, often one used or built for keeping fish (archaic).

stank = 2) pool (archaic).

stank = 3) a ditch with water (archaic).

stank = 4) a small dam (archaic).

stank = 5) a stretch of slow-moving water (archaic).

stank = 6) a moat (archaic).

stank = 7) a weir (archaic).

stanke = stank.

Stannius corpuscles = the bud-like evagination(s) from the wall of the pronephric duct anterior to the opisthonephros (Holosteans) or in the posterior region of the opisthonephros (Teleosteans) in the kidney. Function unknown.

stanza = one of several different growth rates seen during fish ontogeny.

stapes Weberi = scaphium.

staple diet = basic diet (foods which provide the elementary nutritional requirements to assure normal development. Compare balanced diet).

staple room = a room in a merchant's premises where dried and salted cod are graded and stored for export (Newfoundland).

star drag = a star-shaped device for adjusting drag on reels.

star point hook = a hook used in angling with a point like a spear to hold the hook in a fish's mouth.

starboard = the right side of a vessel when facing the pointy end.

starfish = not fish but echinoderms, with usually five arms, tube-feet and a central mouth on the underside.

stargazey pie = sardines arranged in a circle between layers of short crust pastry, a dish of Devon and Cornwall. The fish are stuffed with herbs, mustard, apple or samphire (sea asparagus). The fish heads are left poking through the top.

starry gazy pie = stargazey pie.

starter feed = feed in aquaculture given to larval and juvenile fish immediately following the switch from relying on the yolk to external feeding.

starting point = the date of a published work that for nomenclatural purposes is considered to be the first available or validly published for a particular group.

startling = a sudden darting or swimming movement caused by stress. Often noticed with low dissolved oxygen as the fish are near the surface.

stasis = a period of little or no discernible change in a lineage.

stat. = abbreviation for status, meaning rank.

*stat. nov.* = abbreviation for *status novus*, meaning new status or new rank.

*stat. rev.* = abbreviation of *status revivisco*, meaning status revised.

state = the particular expression or condition of a character, e.g. a character, such as a barbel, can have two states, long or short.

state fish = American states may have a particular fish species as a representative or symbol, sometimes two or more under such headings as warmwater, coldwater, saltwater or marine, sport, and commercial. Some states have no fish designated while others share the same fish. Various common names may be given:-

Alabama            tarpon (*Megalops atlanticus*), largemouth bass (*Micropterus salmoides*)

Alaska	king salmon or Chinook salmon ( <i>Oncorhynchus tshawytscha</i> )
Arizona	Arizona trout, Apache trout ( <i>Oncorhynchus gilae apache</i> )
Arkansas	-
California	California golden trout ( <i>Oncorhynchus mykiss aguabonita</i> ), garibaldi ( <i>Hypsypops rubicundus</i> )
Colorado	greenback cutthroat trout ( <i>Oncorhynchus clarkii stomias</i> )
Connecticut	American shad ( <i>Alosa sapidissima</i> )
Delaware	weakfish ( <i>Cynoscion regalis</i> )
Florida	Florida largemouth bass ( <i>Micropterus salmoides</i> ), Atlantic sailfish ( <i>Istiophorus platypterus</i> or <i>I. albicans</i> )
Georgia	largemouth bass ( <i>Micropterus salmoides</i> )
Hawaii	humuhumunukunukuapua`a or rectangular triggerfish ( <i>Rhinecanthus rectangulus</i> )
Idaho	cutthroat trout ( <i>Oncorhynchus clarkii</i> )
Illinois	bluegill ( <i>Lepomis macrochirus</i> )
Indiana	-
Iowa	channel catfish ( <i>Ictalurus punctatus</i> )
Kansas	-
Kentucky	Kentucky (spotted) bass ( <i>Micropterus punctulatus</i> )
Louisiana	white perch or white crappie ( <i>Pomoxis annularis</i> ), spotted sea trout or speckled trout ( <i>Cynoscion nebulosus</i> )
Maine	landlocked salmon ( <i>Salmo salar sebago</i> ), Eastern brook trout ( <i>Salvelinus fontinalis</i> ), blueback charr ( <i>Salvelinus alpinus oquassa</i> )
Maryland	striped bass or rockfish ( <i>Morone saxatilis</i> )
Massachusetts	cod or Atlantic cod ( <i>Gadus morhua</i> )
Michigan	brook trout ( <i>Salvelinus fontinalis</i> )
Minnesota	walleye ( <i>Sander vitreus</i> )
Mississippi	largemouth bass ( <i>Micropterus salmoides</i> )
Missouri	channel catfish ( <i>Ictalurus punctatus</i> ), paddlefish ( <i>Polyodon spathula</i> )
Montana	blackspotted cutthroat trout ( <i>Oncorhynchus clarkii</i> )
Nebraska	channel catfish ( <i>Ictalurus punctatus</i> )
Nevada	Lahontan cutthroat trout ( <i>Oncorhynchus clarkii henshawi</i> )
New Hampshire	striped bass ( <i>Morone saxatilis</i> ), brook trout ( <i>Salvelinus fontinalis</i> )
New Jersey	brook trout ( <i>Salvelinus fontinalis</i> )
New Mexico	New Mexico cutthroat trout or Rio Grande cutthroat trout ( <i>Oncorhynchus clarkii virginalis</i> )
New York	brook trout ( <i>Salvelinus fontinalis</i> ), striped bass ( <i>Morone saxatilis</i> )
North Carolina	Southern Appalachian brook trout ( <i>Salvelinus fontinalis</i> subsp.), channel bass or red drum ( <i>Sciaenops ocellatus</i> )
North Dakota	northern pike ( <i>Esox lucius</i> )
Ohio	walleye ( <i>Sander vitreus</i> )
Oklahoma	white bass or sand bass ( <i>Morone chrysops</i> )

Oregon	Chinook salmon ( <i>Oncorhynchus tshawytscha</i> )
Pennsylvania	brook trout ( <i>Salvelinus fontinalis</i> )
Rhode Island	striped bass ( <i>Morone saxatilis</i> )
South Carolina	striped bass or rockfish ( <i>Morone saxatilis</i> )
South Dakota	walleye ( <i>Sander vitreus</i> )
Tennessee	channel catfish ( <i>Ictalurus punctatus</i> ), largemouth and smallmouth bass ( <i>Micropterus salmoides</i> and <i>M. dolomieu</i> )
Texas	Guadalupe bass ( <i>Micropterus treculi</i> )
Utah	Bonneville cutthroat trout ( <i>Oncorhynchus clarkii utah</i> )
Vermont	brook trout ( <i>Salvelinus fontinalis</i> ), walleye or walleye pike ( <i>Sander vitreus</i> )
Virginia	brook trout ( <i>Salvelinus fontinalis</i> )
Washington	steelhead trout ( <i>Oncorhynchus mykiss</i> )
West Virginia	brook trout ( <i>Salvelinus fontinalis</i> )
Wisconsin	muskellunge ( <i>Esox masquinongy</i> )
Wyoming	cutthroat trout ( <i>Oncorhynchus clarkii</i> )

state of stocks = the situation of a stock: protected, under-exploited, intensively exploited, fully exploited, over-exploited, depleted, extinct or commercially extinct.

states of nature = the condition of the fishery as defined by stock abundance, age structure, fishing mortality, the economic condition of the industry and the state of the environment.

static gear = any fishing equipment set out and left to catch fish by their movement, e.g. longlines, traps.

staticonic species = a species described in absolute terms, e.g. most species. Opposite to paralliconic.

station = 1) a small sheltered cove from which seasonal fishing operations were conducted in Newfoundland.

station = 2) a sampling locality where fish are caught and environmental conditions recorded scientifically.

stationary = a parameter or life history characteristic that does not change over time, e.g. in fisheries.

stationary fisherman = fishing locally as opposed to migratory fishing (travelling to distant locations).

stationary net = a net which is fixed in position and is not moved, e.g. a stake net, weir.

stationer = a fisherman without a vessel of his own who operated from a station on the shore (Newfoundland).

statistical rectangle = division of the ocean into rectangles with sides ca. 30 miles long; catches are classified internationally by rectangles.

statoconium = "ear-dust", a microscopic (1-50 microns usually with some up to 250 microns) otolith of Cyclostomata and Chondrostei, made up of calcium phosphate with an apatite structure in the former and calcium carbonate in the form of vaterite in the latter. Also called ossiculiths.

statolith = one of the large "ear-stones" of all fishes composed of calcium carbonate as aragonite.

status = 1) the status of a taxon indicates the rank (i.e. level in hierarchy of taxonomic categories) to which it belongs, e.g. genus, subfamily, etc. The status of a taxon may be elevated or reduced (with accompanying ending change when necessary), and this has no bearing on the authorship of the taxon.

status = 2) the condition of a stock or fishery based on stock assessment results, e.g. a stock is overfished if its biomass is below the agreed limit reference point.

*status novus* = new status or new rank. Abbreviated as *stat. nov.*

status quo = 1) the general state of affairs currently in a fishery.

status quo = 2) current level of fishing mortality.

stay = a fleshy, cartilaginous or bony supporting strut.

steady = a pool or stretch of still water in a river (Newfoundland). Also called still.

steady go = a Newfoundland expression for continual work, such as during a capelin scull.

steady state = a population in a steady state may fluctuate about a mean but does not increase or decline in a systematic way with time.

steak = a cross-section slice of a large, dressed fish.

steam = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for minnows.

stearin = a solid formed from fish oils and used in lubricants and coarse soaps.

stede = steid.

steed = steid.

steepel = steeple.

steeple = a pile of fish laid crosswise to dry (Scottish dialect). Also spelled steepel and stipele.

steeved = of a boat, heavily laden with fish (Scottish dialect).

stegural = a paired bony extension developed from the upper margin of the first uroneural of the caudal skeleton as exemplified in Salmonidae. It articulates with the first preural centrum and may represent the first uroneural fused with the first preural and first ural vertebrae.

steid = a heavy stone used as a sinker for a fishing line (Scottish dialect). Also spelled steed, stede and variants.

stel = 1) a place in a river or estuary used for salmon fishing where a net is stretched between stakes across the channel or drawn through the water. Also spelled stele, stell, stelle and stale.

stel = 2) the name of a fishery using a stel. See also ebb stel and flood stel.

stel fishery = the fishery involving a stel.

stel fishing = catching fish using a stel.

stel net = the net used in a stel.

stell = stel.

stellate = star-like, with radiating points. Said of a tubercle with radiating spines. e.g. in *Platichthys*, *Myoxocephalus*, or of a melanophore (sometimes a temporary condition in the latter).

stelle = stel.

stem = in the International Code of Zoological Nomenclature, that part of the name of the type-genus to which is added a family-group ending; where applicable the genitive singular without its case-ending, not necessarily the grammatical stem.

stem group = all the taxa in a clade preceding a major cladogenesis event.

steno- (prefix) = indicating restricted or narrow. Opposite of eury-.

stenobaric = intolerant of pressure, hence depth changes; restricted to a narrow depth range. Opposite of eurybaric.

stenobasal = having a narrow base as in Actinopterygii fins. Opposite of eurybasal.

stenobathic = able to live in only a narrow range of water depths.

stenobenthic = living on a sea or lake bed within a narrow depth range.

stenoendemic = having a restricted distribution.

stenohaline = organisms able to withstand only small changes or ranges in salinity derived from ocean salts. Opposite of euryhaline.

stenohospitalic = a parasite with a phylogenetically narrow range of hosts.

stenokous = adapted for a few specific ecological niches. Opposite of eurykous.

stenophagy = having a narrow range of feeding.

stenosaline = organisms able to withstand only small changes or ranges in salinity derived from land-derived salts.

stenothermal = organisms able to withstand only a narrow temperature range.

stenotopic = 1) having a limited range of geographical distribution.

stenotopic = 2) having a narrow tolerance for a factor such as temperature.

stenotypic = having a narrow range of tolerance to a given environmental factor.

stepped waggler = a float that becomes larger nearer the bottom by abrupt increases in diameter. Usually there are three steps and this type of float works well in rivers.

stereocilium = sterocilium.

stern chasers = luminous glands on the upper and lower surfaces of the caudal peduncle in members of the Myctophidae. They are believed to help distract predators which strike at this attractive region and are confused when the lights are extinguished and the lanternfish darts away.

stern ramp = a sloping ramp at the rear of a trawler which allows the net to be set and hauled. Also called slip.

stern trawler = a trawler where nets are retrieved from the stern with a derrick or gantry, up a ramp, over a roller or over the bulwark.

sternohyoideus = a large muscle originating on the ventral spine of the postcleithrum and inserting on the sides of the urohyal. It functions in rapid opening of the jaw and expanding the buccal cavity.

sterocilium = one of a series of cilia projecting from each sensory hair cell of the maculae of the inner ear. Sterocilia are often graded in size and distinct from an eccentric, longer kinocilium.

steur herring = round cured herring, packed in barrels (Netherlands).

stew = a small pond where fish are kept for eating, now obsolete. Also called vivarium.

stewed to the gills = drunk; inebriated.

stick = fish marketed in the form of rectangular sticks cut from a block of frozen fish fillets, breaded, fried in fat or sold frozen for cooking.

stickbait = a cigar-shaped fishing plug with no built-in action. It can work in a zig-zag movement across the water to imitate an injured minnow by a pull and pause action.

stick float = a long straight piece of wood or a quill, the thin body remaining upright in fast water. The stem of the float is a heavy cane, plastic, lignum or wire and the top is a buoyant balsa. The float is attached to the line by two or three plastic sleeves.

stick gear = a ridged or semi-ridged pole, stick, cable, etc., with attached hooks that is fished on the bottom or mid-depth, attached by a line to a surface buoy for retrieval. Used in kelp beds.

stick water = the aqueous, sticky part of press liquor (*q.v.*) from the manufacture of fish meal; about 20% of the solids in fish meal are recovered from stick water.

stick-held dip-net = a Japanese lift-net (*q.v.*) spread and suspended by poles from the side of a ship. Fish are attracted to the other side of the ship by strong lights which are then switched off and lights illuminated over the net to guide fish around and under the ship and over the net. Used to catch sardines and Pacific saury.

stick-snare = snare.

stiff rig = an angling rig made of a stiff material, such as amnesia, *q.v.*, that does not flex easily.

stike = a quantity of eels, numbering 25, in 13-14th century England. Also called strike. Ten strikes makes a bind of eels.

stiel = stel.

still = 1) stel.

still = 2) steady.

still fishing = fishing with a bait or lure that does not move through the water, e.g. from a boat or shore with a float or bobber.

still water = 1) a flat section of a stream where no current is discernible.

still water = 2) any aquatic habitat, usually fresh water, that has little or no current.

still-born synonym = a name first published as a synonym of another name which was accepted as the correct one by the author of the work.

stillwater = the adjective in describing still water, e.g. a stillwater habitat.

sting = a stiff pointed spine, integumentary sheath, and accompanying venom glands. The integumentary sheath generally includes the venom glands, e.g. sting of Dasyatidae.

stinger = an extra hook attached behind the normal hook on the tail of a lure.

stinging = the act of introducing venom into the flesh of a victim by means of a venom apparatus; envenomation.

stingray leggings = Kevlar cloth leggings used to protect and angler's legs from stingrays.

stingsman = a man who keeps a salmon cable from grounding during fishing by using a sting or pole (Scottish dialect).

stink bait = a bait with added scent or any meaty or fishy bait allowed to rot.

stink box = a large box in which eulachon (*Thaleichthys pacificus*, Osmeridae) are placed to ripen after being caught in March and April in the Pacific northwest (see also grease trail).

stinker = bilgy fish (a foul smelling fish (Canada) caused by rapid growth of anaerobic bacteria. Occurs when fish are stored under conditions where air is excluded, e.g. pressed against the side of a warm container).

stinkpot = a device used by pirates when boarding a ship. The earthenware pots contained potassium nitrate, asafetida (a smelly resin), calcium carbonate and decayed fish. When smashed on deck, a nauseating smoke discouraged the defenders.

stinky = bilgy fish (a foul smelling fish (Canada) caused by rapid growth of anaerobic bacteria. Occurs when fish are stored under conditions where air is excluded, e.g. pressed against the side of a warm container).

stipe = steeple.

stippled = sparsely pigmented with melanophores.

stitched = a lateral line pattern of pigmentation with a dot or line above and below each pore, resembling stitches.

stochastic = having components affected by random variability, e.g. future recruitments in a fishery are projected with a stochastic component (random variables) to allow for unexplained effects.

stock (verb) = to add eggs, young or adults of a species to a body of water to increase the population of that species or growth rate of that or another species.

stock (noun) = 1) a distinct genetic population.

stock (noun) = 2) a population defined by movement pattern or its absence (migratory and resident stocks).

stock (noun) = 3) a population defined by a common growth rate.

stock (noun) = 4) part of a population potentially harvestable, i.e. an assessment or management unit, or a quantity of fish from a given area; usually isolated from other stocks of the same species and so self-sustaining. May be a total or a spawning stock.

stock (noun) = 5) a group of similar species living in the same general area or habitat and managed and caught by fisherman as a group, e.g. small flounders, redfish species.

stock (noun) = 6) all or some of the above. See also fishable stock and spawning stock.

stock (noun) = 7) used for steamed fish; made of lightly salted cold water, bones and trimmings of fish, seasonings, simmered for half an hour, strained when almost cold and a little white wine or vinegar added. stock assemblage = stocks that live together, have the same life histories and are caught with the same fishing gear.

stock assessment = determining the current and probable future abundance of commercial fish stocks through the collection and analysis of data from life history studies, environmental surveys and catch statistics. There are two main components, studying the biology of the stock and studying the fisheries activities.

stock assessment driven = fishery management where stock assessment is the priority activity.

stock biomass = total weight of fish in a stock.

stock enhancement = release of hatchery raised fish to increase wild fish numbers in a stock.

stock externality = the impact on a non-targeted stock of fish caught when a targeted group of fish is harvested, cf. crowding externality.

stock figure = the number of fish stocked in a particular pond as determined by the pond's productivity.

stock fish = fish that have been gutted, beheaded, split or not, dried hard in the open air without salt, and with a water content below 15%. Usually cod and relatives, particularly a product of Norway and Iceland. Used as money or a medium of exchange, a pair of leather shoes being worth 4 stockfish in trade between Icelanders and English and 120 stock fish being worth 4 tons of beer.

stock number = total number of fish in a stock.

stock origin = the genetic history of a stock.

stock pond = a pond for rearing brood fish.

stock recovery = a significant increase in the numbers of a heavily fished stock after fishing pressure is decreased.

stock recruitment model = a fishery model that predicts the amount of juvenile recruitment as a function of the parent stock. Also called stock recruitment relationship.

stock recruitment relationship = stock recruitment model. Abbreviated as SSR.

stock reduction analysis = a stock assessment method that estimates the biomass of a fish population using catch history data, information on the productivity of the species and a time series of abundance indices such as catch per unit of effort.

stock status = the current condition of a stock, which may be based on escapement, run size, survival, or fitness level.

stock structure = 1) size or age composition of a stock.

stock structure = 2) species composition of a stock.

stock structure = 3) geographical organisation of a species in terms of genetic structure of a stock.

stock structure = 4) geographical boundary of a stock assumed for management and assessment purposes, e.g. North Atlantic and South Atlantic.

stock transfer = transfer of fish from one location to another.

stock-breeder = a fish selected for breeding purposes.

stocker = 1) small fish in a catch given to apprentices (U.K.).

stocker = 2) small fish eaten by the crew.

stocker = 3) fish prepared to some degree by the crew, e.g. skin removed.

stocker = 4) rough or less popular fish.

stockerbait = stocker (2).

stockfish = stock fish.

stocking = moving fish to a water body so that ongrowing can occur.

stocking density = the number or biomass of fish stocked per unit area or volume.

stocking policy = a programme for stocking open waters in order to maintain proper fish stocks.

stocking rate = the number of fish released per unit area or volume.

stocklet = a small or geographically confined stock.

stomach = the part of the digestive tract after the oesophagus, not differentiated as a distinct section of the intestine in all fishes. Where distinct having a straight fundic ventral portion ending as a blind sac and a short pyloric portion extending dorsally to the proximal end of the intestine.

stomodeal denticles = special placoid scales lining the mouth and pharyngeal cavities of some Elasmobranchii, e.g. *Heterodontus*.

stomodaeum = the embryonic precursor to the mouth cavity and anterior pharynx. In fish (and other vertebrates) the gut develops from the rear and the mouth and pharynx are derived by this secondary invagination of superficial ectoderm. The two eventually meet to form a continuous digestive tract.

stone mound = a Japanese system for catching freshwater fish and shrimps; consists of a mound of 200-900 stones, 2-3 m square at the base, sometimes covered with straw matting. The fish are attracted to the stones as a hiding place. The mound is surrounded by a bamboo screen or net with 2-6 traps attached. Removal of the stones enables the fish to be caught in the traps.

stonfo adaptor = a plastic connector used to connect the elastic, q.v., in a pole to the fishing line. The adaptor has a hook where a loop made in the end of the fishing line attaches and a sleeve that pulls down over the hook to lock the rig in place. The elastic in a pole should be tight enough to hold the stonfo adaptor snugly to the pole tip but retain enough stretch for a fish to pull it out.

stonk = stang.

stonker = 1) a large fish (United Kingdom).

stonker = 2) an implement for catching eels (United Kingdom).

stop = stop netting.

stop net = stop netting.

stop netting = 1) a net positioned to retain fish as the tide falls.

stop netting = 2) a net positioned across a bay or other delimited area, the fish so enclosed being removed with seines, dip-nets, etc. Also called stop seine.

stop seine = a net positioned across a bay or other delimited area, the fish so enclosed being removed with seines, dip-nets, etc. A bar seine.

stopper net = stop netting.

storage pond = a pond for the temporary holding of marketable fish.

storage reservoir = a reservoir that retains water from spring and releases it as required, e.g. for power production, fish passage.

store = fish store (a building where dried cod from the offshore fishery was stored for collection or export (eastern Canada). Cod were also cleaned, washed, salted and stored in large puncheons. Also used to store gear in winter and spring and as a place to mend nets. The floorboards were kept loose so that unusually high tides would simply lift the boards and not

damage the store. A launch enabled boats to be hauled out of the water for repair and painting. A rail on the wharf was used for drying nets. Flakes (*q.v.*) or platforms of boughs were erected in nearby fields and salted fish were laid out on them to dry in the sun. Such fish kept for long periods, even under tropical conditions, without refrigeration).

stoup net = a type of salmon fishing net stretched on poles (Scottish dialect). A rope is stretched between two poles, fastened in that part of the river intended to be fished. To this rope are fastened boats in which the fishermen sit. The net is made of three poles, joined together in the form of an equilateral Triangle, round which the net is fastened. The base of the triangle lies on the bottom and to the angle at the top is fixed a pole, which the fisherman holds in his hand, till he feels a salmon strike the net, and then by bending down the long pole over the edge of the boat, he forces up the net with the fish in it.

stour = stower (2).

stow net = a conical net secured by boats, anchors or stakes in rivers or areas with strong currents. Also called gape net, swing net.

stower = 1) a person responsible for stowing fish in a ship's hold.

stower = 2) a stake or post in a fence supporting a fish net.

straddling stock = fish stocks that are found on both sides of a political demarcation, or migrate across it, or migrate between an exclusive economic zone and the high seas.

strag = a catch of fish (Scottish dialect).

straggler = a fish or group of fish that have strayed beyond the usual range or have remained behind when others migrate.

straight net = set gillnet (a gill net fixed to the bottom or a distance above it by anchors or ballast. Also called anchor net, sunk gillnet, sunken gill net, sunk net).

straight waggler = a waggler float (*q.v.*) with no body used for fishing at depth in running water.

strain = a group of fish from the same area or breeding programme distinguished by colour, disease resistance, etc.

strait = a narrow stretch of water connecting two extensive areas of ocean.

straits fish = cod taken and cured in the Strait of Belle Isle (Newfoundland).

strand = a beach or sea shore.

stranding = fish that become washed up on shore through changes in currents or detrimental environmental conditions. In some cases may form a fishery when it happens at predictable times, e.g. salmon on migration that fail to leap a waterfall and strand on land. In the past, large fish coming ashore was taken to mean trouble for the reigning monarch.

strange and wonderful herring = "A most Strange and wonderfull Herring" appeared on an early 1597 printed pamphlet in England. It's scales showed a picture of two armed men fighting on one side and on the other side "most strange Characters".

strange fish = someone aware of culture from the saying "it's a strange fish that knows the existence of water".

strap = a catch of trout hung on a branch through the gills (Newfoundland, Scotland).

stratification = the separation of a lake or body of water into layers of different temperature, due to heating of the surface and failure of heat to reach the bottom. See hypolimnion thermocline, epilimnion.

stratified mean catch per tow = from research vessel surveys and for separate species of fish, each average catch per tow in each geographical stratum of a region is multiplied by the stratum area. All the individual products are added together and the total divided by the sum of the entire area of the region giving stratified mean catch per tow, an index of relative abundance.

stratoconia = fine otolith-like particles in the inner ear varying in size in sharks from a few to about forty microns. These may be endogenous crystals such as aragonite or calcium carbonate monohydrate or exogenous sand grains (see also otoconia).

stratum germinativum = the epidermal cells nearest the dermis that generate new cells by mitosis. This layer of cells is cuboidal or columnar but the cells become flattened as they migrate to the skin surface, eventually sloughing off.

stray-line = a length of line attached to various types of fish nets and gear.

straying = a natural phenomena of adult spawners not returning to their natal stream, but entering and spawning in some other stream.

streaked = a pigment pattern of short to moderate length lines.

streaker = a male that rushes in to join the spawning pair without participating in courtship.

stream = 1) the technical term for any natural body of running water; a river is then just a large stream.

stream = 2) a small body of running water.

stream = 3) an oceanic current.

stream = 4) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for minnows.

stream bed = the channel occupied or formerly occupied by a stream.

stream capture = the process by which the range of a species is extended through the switch of the flow of a stream or a part of a stream from one drainage basin to another.

stream channel = a long channel formed by, and more or less filled by, a stream.

stream current = a narrow, deep and fast ocean current, e.g. the Gulf Stream, important in dispersing fish larvae.

stream net = 1) a stake net used to catch fishes in a fast moving stream.

stream net = 2) a landing net (*q.v.*) with a very short handle (0.5 m) attached to an angler by an elastic cord. Used to lift caught fish from the water in streams as the angler wades or walks along.

stream order = a classification of stream complexity based on the number of tributaries. The smallest unbranched tributary in a watershed is called order 1; a stream formed by the confluence of two order 1 streams is called order 2; a stream formed by the confluence of two order 2 streams is called order 3; and so on.

stream piracy = stream capture.

stream reach = section of a stream between two points. An individual first order stream or a segment of another stream that has beginning and ending points at a stream confluence. Reach end points are normally designated where a tributary confluence changes the channel character or order.

stream type = chinook salmon populations that emigrate to the ocean as one-and two-year-old smolts. As juveniles, stream-type fish exhibit behavioral and morphological characteristics consistent with establishing and maintaining territories in freshwater systems.

stream weir = a weir blocking a stream and catching fish moving both up and down the stream.

stream-maturing = steelhead (*Oncorhynchus mykiss*) that enter fresh water in a sexually immature condition and require several months in fresh water to mature and spawn, commonly referred to as summer steelhead.

streamcraft = reading the stream environment in order to catch fish.

streamer = a lure or wet fly with feathers arranged to imitate a fish or other food. Fished below the surface, require action to be effective, the wings moving as the fly is retrieved.

streamflow = the discharge that occurs in a natural channel; usually used to describe the discharge in a surface stream. The term streamflow is more general than the term runoff, as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

streamlet = a small stream, a creek.

stremel = fillet strips from smoked salmon or coalfish (*Pollachius virens*) (Germany).

strengthening bag = netting around and attached at intervals to the codend of a trawl. It serves to prevent bursting of the full codend.

streptococcal septicaemia = an acute systemic bacterial disease of warmwater fishes caused by *Streptococcus* sp.

streptomyces = a chronic systemic bacterial disease of salmonids and other freshwater species caused by *Streptococcus* sp.

stressed area = an area of special concern for the fish, perhaps because they are small or fishers are in conflict.

stret-pegging = an angling technique used in flowing water. Weights are spread evenly along the line or concentrated near the float but a long unweighted section of line is left near the hook. The baited hook then can rise in the water if the float is held back or fall gently to the river bed, or be moved naturally by currents, searching the river.

stretch = in reference to a river, a section of uniform character.

stretched measure = 1) the stretched length from inside corner to inside corner of the mesh of a net, i.e. the size of the holes, used to denote mesh size. Usually the average of 10 consecutive meshes is taken. May be measured when wet from inside the first knot but include the last knot.

stretched measure = 2) the size of a piece of netting when all the meshes are closed by stretching the net.

stretched mesh = 1) the mesh of a net when it is pulled shut.

stretched mesh = 2) also used for stretched measure (1).

stria (plural striae) = strictly a groove but used for a fine parallel line or ridge bordering a groove, e.g. on the opercles of *Sardinops*, or scales of many fishes, or teeth of Chondrichthyes.

striae = plural of stria.

striated = with fine lines, often parallel. Strictly should be a groove but generally used for parallel lines with a groove between.

striated gut = a gut with many sinusoidal folds resembling lines or bands in lateral view.

Strickland tautonomy = in 1843, H. E. Strickland and others considered rules of zoological nomenclature, one of which was that no genus and species name should be the same. As a result various authors proposed replacement names for the species name; this is no longer the case and unneeded replacement names may occur in taxonomic works.

stridulation = sound production by the rubbing together (friction) of two hard parts, may be internal structures like pharyngeal teeth or external ones like the pectoral fin, e.g. in *Callomystax* (Siluridae), *Bagre* (Ariidae), *Balistes*, *Dactylopterus*, etc. The channel catfish,

*Ictalurus punctatus*, produces sound when ridges on the ventrolateral surface of the pectoral fin spine's dorsal process rub against the ventrolateral wall of the cleithrum's spinal fossa.

strike = 1) a sudden pull on the line to set a hook in a fish's mouth when angling.

strike = 2) taking of bait by a fish. Also called bite, bump and hit. In Britain bite has the same meaning as the American strike.

strike = 3) stike.

strike in = 1) fish appearing in large schools in coastal waters (Newfoundland).

strike in = 2) to impregnate with salt in the curing process.

strike zone = the area around a fish where it feeds and where it will take a lure or bait. Varies with the species and its feeding habits, with water conditions and whether the fish is actively feeding.

striking = the process of initial brine contact up to the fourteenth day in fish food preservation.

stringer = 1) a thick line, sometimes with a float, used to hold fish until weigh-in or release. The only effective way for an angler wading in open water to retain his catch and keep it fresh.

stringer = 2) a group of caught fish held on a line for easy carrying or retention.

stringer = 3) the legally caught limit of fish.

stringy = the uneven appearance of salted fish which has become case hardened (*q.v.*).

strip = 1) to artificially remove eggs or sperm by manual pressure on the sides of ripe fish for purposes of fish culture.

strip = 2) an even piece of fish in the U.S.A., usually half a dried salted cod cut down the middle, fins, skin and bones removed.

strip = 3) pulling line by hand rather than by means of a reel in angling.

strip = 4) in reference to a fish kiln, removing the bottom fish when they are ready in order to move the top fish closer to the fire.

strip bait = part of the belly and fins cut off a fish and used as bait.

strip pit = an excavation made by strip-mining, water-filled and often stocked with a managed fish population for angling.

strip transect = an area in the form of a strip (narrow and elongate), under examination in assessing ecology of fishes living or visiting that area, e.g. on the sea bed.

stripe = 1) a horizontal band of pigment, often along the flank of a fish and usually narrow (a bar is a vertical band of pigment; see also band).

stripe = 2) a straight line of pigment, variable in width, and which may be oriented vertically, horizontally or obliquely.

stripping = 1) pressing on the abdomen to release eggs or milt for artificial fertilisation.

stripping = 2) bringing in a fly line with a series of short or varied pulls so as to imitate an insect or fish.

stripping = 3) pulling line off a reel by hand.

stripping guide = the guide nearest the reel on a fly rod, so-called because the line is pulled over it with some force. Some rods have two stripping guides, the larger nearer the reel. A stripping guide is larger than the snake guides nearer the rod tip.

strodd = strud.

strong = easily observed or highly developed.

struck = the condition of a fish when the salt concentration has reached a maximum in the centre of the thickest part of the fish.

structural colour = colour in a chromatophore produced by light reflections from a colourless surface and tissue refractions. Also called schematochrome.

structure = changes in the bottom contours of water bodies, especially those influencing fish behaviour.

structure fishing = using a knowledge of structure to catch fishes.

structure spoon = a heavy metal lure with a swinging hook used in spinning and jogging.

strud = to pull hard as with a hooked fish (Scottish dialect). Also spelled strodd.

struggle = a supper of fish and chips in a restaurant (Scottish dialect).

struggle shop = a fish and chip shop (Scottish dialect).

strung herring = herring pierced by half inch diameter and 3 feet long rods through the gills and out the mouth for smoking.

struvite = crystals of calcium or magnesium ammonium phosphate found in canned and chilled or frozen smoked fish. Resembles pieces of broken glass but is harmless. Linked to the presence of magnesium chloride in unrefined salt used for making brine and to high postmortem pH in the flesh.

stu apte improved blood knot = a knot used for joining two lengths of monofilament of unequal size. Various websites have animated steps showing how to tie this knot.

Stückenfisch = hot-smoked pieces or Stücken (steaks or cutlets) of various fishes (usually marine fishes)(Germany).

stuckie = a thick codling (Scottish dialect).

study collection = a museum collection with fewer restrictions than a research or primary collection but more restrictive than an education collection. Some experience is required before access is permitted.

study mount = a specimen mounted in a manner to facilitate study, e.g. a fish skeleton, rather than for exhibition.

stuffed eelskin = from the 1919 novel "My Man Jeeves" by P. G. Wodehouse - "Aunt Agatha waiting on the quay for me with a stuffed eelskin" and from his 1924 novel "Ukridge" - "He resembled a minor prophet who had been hit behind the ear with a stuffed eel-skin".

stuffed fish = whole dressed fish with stuffing inserted before cooking. Some flatfishes are marketed frozen and stuffed.

stuffed to the gills = in reference to people not fish, meaning full of food or bloated. May be an analogy to a fish that has been prepared as food with stuffing in the abdominal cavity as far as the gills.

stukkie = stuckie.

stunk = stang.

stunted = fish smaller than normal through lack of adequate food.

stupefying fish = methods of collecting fish that render them unconscious, e.g. throwing rocks and boomerangs, banging on rocks or ice, poisoning with natural and industrial chemicals, explosives, suffocation, use of electricity, etc.

sturgeon = 1) a member of the family Acipenseridae found in northern hemisphere fresh and marine waters with about 24 species. Important for caviar (*q.v.*) and, in the past, isinglass (*q.v.*).

sturgeon = 2) not the fish but a proposed measure of magnetic reluctance (the opposite of inductance) named for William Sturgeon.

sturgeon = 3) an encryption system, one of the fish (fibonacci shrinking) German teleprinter cipher used in World War II. Bletchely Park never read much of its traffic. See also tunny.

sturgeon boiler = a person who extracts oil from sturgeons.

sturgeon gear = a fishing method involving numerous unbaited hooks strung across a river to snag migrating sturgeon.

sturgeon glue = a glue made from the inner membrane of sturgeon swimbladders. Used by conservators as a consolidant and adhesive in repairing paintings.

sturgeon lips = having protruding lips like a sturgeon.

sturgeon pickle = a pickle for preserving sturgeon flesh.

sturgeon strike = a law enforcement term for leaping Gulf sturgeon on the Suwanee River, Florida that hit boaters. Sufficiently serious that broken limbs and other severe injuries can result.

strurine = a protamine in sturgeon sperm. See also salmin(e).

stygo- (prefix) = pertaining to groundwater habitats.

stygobiont = an organism inhabiting groundwater.

stygobite = a hypogean organism showing some form of specialisation to the that environment, e.g. in fishes loss of pigmentation and eyes; troglobite.

stygofauna = the animals living in an underground environment.

stygophile = an organisms that uses hypogean resources but may not live there continually; a trogophile.

stygoxene = an organism found actively or accidentally in a hypogean environment; a trogloxene. Some definitions restrict this term to accidentals only.

style = a type of split shot, *q.v.*, being a thin lead bar with a lengthwise cut, used on pole rigs.

styliform = having shape of a pointed rod.

stylohyal = interhyal (the deep, endochondral bone between the hyomandibula and symplectic bone and above the epihyal in the hyoid arch). Not homologous with the stylohyal of Tetrapoda.

stylophthalmoid = the larvae of Myctophidae, characterised by eyes on stalks.

styls = small elongated split shot used for weighting delicate angling rigs.

sub- (prefix) = under, below, inferior; now transmogrified into such meanings as near, almost approaching, lesser, more or less, approximately, sort of, e.g. subtriangular meaning almost a triangle in shape.

sub-endemic = a species endemic to a place, e.g. an island, and also a nearby area, e.g. the mainland adjacent.

sub-tropical convergence = ocean region where warmer water of tropical origin interfaces with water originating in colder regions.

sub-type = an obsolete rank in the category of subphylum.

subabdominal pelvic fin = pelvic fins located anteriorly on the abdomen but not attached internally to the pelvic girdle.

subadult = an individual similar to the adult in appearance but not yet capable of breeding.

subaerial beach = that part of a beach uncovered by water. Also called drying beach.

subaqueous = in or under water.

subcaudal marsupium = the name applied to the brood-pouch in Syngnathidae. It consists of a vascularized groove formed by flaps of skin along the underside of the tail of males.

subclavian artery = the artery supplying the pectoral fin.

subclavian vein = the vein carrying blood from the pectoral fin to the cardinal system.

subcutaneous = occurring below the skin.

subcutis = a very thick layer in the skin of Petromyzontidae separating the dermis from the underlying muscles.

subcylindrical = almost round in cross-section.

subequal = slightly less than equal.

Suberkrub otter board = an all-steel and cambered otter board on a midwater trawl, vertically aspect greater than the horizontal. Named for its inventor.

subfamily = 1) a category of the family-group subordinate to family.

subfamily = 2) an individual taxon of the category "subfamily", e.g. Salmoninae. The recommended ending is -inae.

subfossil = a fossil of post-Pleistocene age, often belonging to an extant species.

subgen. = subgenus.

subgenera = plural of subgenus.

subgenotype = an obsolete term in nomenclature for the type species of a subgenus.

subgenus (plural subgenera) = 1) a category of the genus-group subordinate to genus.

subgenus (plural subgenera) = 2) an individual taxon of the category "subgenus", e.g. *Clupea*.

subgular = below the throat.

subinfraorbital = a long postorbital bone in Amiiformes.

subjectively invalid = in nomenclature, a name which, in the opinion of an author, is not to be applied to a particular taxon because it is a junior subjective synonym, *nomen dubium*, junior secondary homonym, or conditionally suppressed.

subjective synonym = see synonym.

sublingual = under the tongue.

sublittoral = in lakes the sublittoral zone extends from the lakeward limit of rooted vegetation down to about the upper limit of the hypolimnion; in the ocean from the lower edge of the intertidal (littoral) zone to the outer edge of the continental shelf at 200 metres.

submandibular = a branchiostegal ray on the ventral surface of the jaw in Sarcopterygii.

submarginal = below or next to the edge.

submarine canyon = a v-shaped valley running across the continental shelf (*q.v.*) and down the continental slope (*q.v.*).

submaxillary = a cartilaginous or bony rod that connects the preethmoid (prevomer in Neostethidae) with the maxillary.

submental crest = an outgrowth of the dentary bone of the lower jaw. The crests from each side of the lower jaws converge anteriorly. Also called mental or chin crests.

submental organ = the accessory organ which runs along the lower jaw and lower edge of the gill cover and consists of drum-shaped electrocytes.

submerged bank = a large and flat area of bottom, markedly shallower than the surrounding ocean floor.

submerged land = lands covered by water at any stage of the tide.

submerged vegetation = aquatic vegetation that requires full immersion in water and provides an important fish habitat.

submergence = tendency for fishes of higher latitudes to seek deeper (colder, darker) water towards the tropics. Also called equatorial submergence, e.g. Cottidae, Zoarcidae.

submersible traveling screen = a wire mesh screen that acts like a conveyor belt when installed in the intakes of turbines at dams guiding and transporting juvenile fish into bypass channels.

submucosa = the middle layer of the gas bladder, *q.v.*, made of loose and fibrous connective tissue. See also the tunica externa and the tunica interna.

subnatio = an obsolete proposed category below natio (*q.v.*).

subocular = below the eye.

subocular bar = a vertical or slightly oblique dark bar under the eye. Also called suborbital bar.

subocular shelf = a bony plate which extends inwards from the bones of the infraorbital series in, e.g. Myctophidae.

subopercle = the paired dermal bone lying below the opercle in the gill cover. Also called subopercular and suboperculum.

subopercular = strictly the adjective for subopercle but also used for the bone.

suboperculum = subopercle.

suborbicular = nearly circular.

suborbital = below the eye. Name applied to the first six circumorbital bones: suborbital 1 (lachrymal or preorbital), suborbital 2 (jugal), suborbital 3 (true postorbital), suborbitals 4 and 5, and suborbital 6 (dermosphenotic). Also called infraorbital bones. Associated with the infraorbital lateral line. Sometimes reserved for a chain of small bones below the infraorbitals and unrelated to the infraorbital sensory canal, e.g. in palaeoniscoids, usually absent in advanced fishes.

suborbital bar = subocular bar.

suborbital canal = infraorbital canal (the cephalic lateral line canal (*q.v.*) extending from behind and below the eye to behind the upper lip. Abbreviated as IO).

suborbital photophore = the light organ below the middle of the eye in Myctophidae. Abbreviated SO.

suborbital shelf = a shelf extending mesially to support the eye in Myctophidae. Also called infraorbital shelf or subocular shelf.

suborbital stay = the bone beneath the eye (suborbital bone) extending across the cheek to the preopercle, or almost to the preopercle. Found in Scorpaeniformes.

suborbital width = least distance between the orbit and the lower suborbital or preorbital margin.

subordinate taxon = a taxon of lower rank than that with which it is compared.

suboshi = shiraboshi (sun-dried or artificially-dried unsalted fish (Japan)).

subpectoral photophore = the light organ near the lower base of the pectoral fin in Myctophidae. Abbreviated PVO.

subpopulation = a well-defined set of interacting individuals that compose a proportion of a larger, interbreeding population.

subquadrate = approaching a square in shape.

subrostral fin = a shelf-like projection extending forward under the rostrum of Myliobatidae formed from the anterior extension of the pectoral fin and rostral cartilage. Also called subrostral lobe.

subrostral lobe = subrostral fin.

subsequent designation = the designation of the type of a taxon in a work published subsequent to the establishment of the taxon.

subsequent fixation = the fixation of a type of a taxon in a work published after the establishment of the taxon; fixation by subsequent designation, *q.v.*, or subsequent monotypy, *q.v.*

subsequent monotypy = if no nominal species were included at the time a genus was established before 1931 and subsequently a single nominal species is first referred to the genus, then that species is *ipso facto* the type-species.

subsequent spelling = any changed spelling of a name. A correct subsequent spelling is brought about by justified emendations (*q.v.*) of the original spelling. An incorrect subsequent spelling is a change in spelling other than a justified emendation (*q.v.*).

subsidence fishery = a fishery for survival (see subsistence fishery).

subsistence culture = pond culture of fishes with the harvest for local consumption by the fishers. Often producing at a continual low level rather than peaking at intervals.

subsistence fishery = a fishery where the fish are consumed directly by the families of the fishers rather than being bought by middlemen and sold at the next larger market.

subsistence harvest = harvests of fish by natives for ceremonies and to support traditional lifestyles. Also called ceremonial harvest.

subsp. = abbreviation for subspecies.

subspecies (singular and plural) = 1) a category of the species-group subordinate to species; the lowest category recognized by the International Code of Zoological Nomenclature.

subspecies (singular and plural) = 2) an individual taxon of the category "subspecies". Allopatric populations of organisms differing genetically from other such populations and tending because of barriers not to interbreed with other such populations, although capable of doing so. Defined variously as differing at a level of 75-90% or 93% from (all or any) other such adjacent populations.

subspecific name = the third term of the trinomen, a subspecies.

substitute name = replacement name or *nomen novum* (a new name (*nomen novum*) published or an available synonym adopted to replace an earlier name, and valid only if the latter is preoccupied; commonly applied to substitute names proposed to replace junior homonyms).

substitution = the act of introducing a substitute name.

substitutions = in fishery science, missing data can be filled in by information from a similar source, e.g. missing catch data from one vessel can be substituted by data from another vessel fishing in the same area with the same gear.

substrata = plural of substratum.

substrate = bottom or bottom materials:- large boulders (>1024 mm), small boulders (256-1024 mm), stone (256-600 mm), rubble or large cobble (128-256 mm), cobble or small cobble (64-128 mm), pebble (2-64 mm), coarse gravel (32-64 mm), fine gravel (2-32 mm), sand (0.062-2.0 mm), silt (0.004-0.062) and clay (<0.004).

substratum (plural substrata) = the bottom; the surface available for colonisation by organisms.

substratum chooser = a fish species spawning on the substrate; usually cleaned by the male, before attracting the female.

subsurface lure = a lure designed to run at shallow depths.

subtaxon = a subdivision of a taxon.

subtemporal = supraopercular.

subterminal = nearly terminal, almost at the end, e.g. said of the mouth or of a barbel position.

subtractability = how the use of f fishery resource by individuals or groups subtracts from the welfare of others.

subtriangular = almost triangular.

subulate = awl-shaped, elongate and tapering to a point.

subyearling = a developmental life stage of fish that are less than one year old.

subwatershed = one of the smaller watersheds that combine to form a larger watershed.

success = in respect of fishing, catch per unit effort (catch in numbers or weight taken for a given amount of fishing effort expressed as a ratio; the more recent form is catch/effort (C/f). Also called availability).

succession of teeth = the continual replacement of older, lost and broken teeth in the jaws of sharks by new ones further back on the jaw migrating forward, as on a conveyor belt. Occurs as frequently as every week in young sharks. Two to three rows are functional at one time and up to a third of the teeth are in replacement mode at any one time.

sucker = 1) any organ which has an adhesive action.

sucker = 2) a member of the mostly North American freshwater fish family Catostomidae.

sucker = 3) an easily tricked person. From the easily caught sucker or the innocence of a child feeding at the breast.

sucking disk = a disk-like structure used by a fish to attach itself to rocks or vegetation.

sucker fishing = remora fishing (a captured remora is released from a boat with a line attached through its tail or to a ring through the tail. The remora then attaches to a turtle or shark which can be pulled to the boat and speared. The technique is known from the Caribbean to east Africa and China and Australia. This temporary attachment of one animal to a faster one is called phoneses).

suction pump = a mechanical device that sucks up fish and water for rapid removal from a net or the hold of a vessel.

suctorial = functioning as a sucker.

sud = snood (Newfoundland). Also spelled sed and sid.

sudd = a floating mass of plants or plant material.

suehiroboshi = sakuraboshi.

suffix (plural suffixes) = various words are suffixes or general terms applied to fish names but are not always listed under every fish name here. Their definitions generally appear under the suffix. They may be separate words, hyphenated or part of a single word. Examples are trout angler, trout fishery, trout rod, trout stream, etc. The suffixes and terms are as follows:-

-angler

-angling

-bait

-bank

-barrel

-basket

-bed

-boat

-breeder

-brook

-broth

-catcher

-coloured

-culture

-curing

-farm

-fish

-fisher

-fisherman

-fishery

-fishing

-fleet

-fly

-food

-fry

-gaff

-harvest

-hatchery

-hatching

-hole

-hook

-kettle

-killer

-larva

-let (meaning young)

-like

-line

-maw

-maid (young fish)

-meal

-meat

-monger

-net

-oil

-pass

-paste

-pie

-pond

-preserve

-rearing

-river

-rod

-run

-sauce

-school

-season

-smoker

-smoking

-sound

-spawn

-spear

-stream

-tackle

-tank

-trap

-trip

-trolling

-vessel

-weir

-worm

suffixes = plural of suffix.

suffusion = an overspreading of colour.

sugar cured fish = fish such as herring preserved in salt and sugar.

suitability index curve = a graph showing the suitability of a habitat for a fish species or one of its life stages based on relative preference for habitat variables.

suk = souk.

suke = souk.

sukimi = bits of fish scraped from the bones and used in rolls in sushi restaurants. Often refers to tuna (maguro).

sulcate = having long narrow channels or flutes; furrowed or grooved.

sulci = plural of sulcus.

sulciform = groove-shaped.

sulcus (plural sulci) = 1) ditch, notch, gap, furrow.

sulcus (plural sulci) = 2) a radiating groove in the bony layer of the scale running from the centre to the edge. Also called radii.

sulcus (plural sulci) = 3) a groove developed by the primary vascularisation canals leading from the root base to the main foramina in the chondrichthyan anaulacorhizid tooth root type (Herman *et al.*, 1994).

sulcus (plural sulci) = 4) sulcus acusticus.

sulcus acusticus = a groove along the medial surface of the sagitta near where growth increments are particularly clear.

sum = soom.

summer fishery = the principal cod fishery in Newfoundland.

summer herring = herring schools which migrate to inshore waters in summer in Newfoundland.

summer house = a house built for use during the May-October cod fishing season in Newfoundland; fishermen and their families moved into them for the season.

summer-run fish = anadromous fish that migrate to fresh water in summer, overwinter there and spawn in spring.

summerkill = the death of fishes in enclosed water bodies during summer owing to oxygen depletion and/or toxic algal blooms.

summerling = any fish from advanced fry to the age of one year, usually caught in the autumn.

summery fry = fry caught during the growing period.

sump = a small pond in a rice paddy and fish culture system where fish can shelter from heat and predators and where they are easily collected.

sun burn = dried fish overly exposed to the sun resulting in a burn.

sun-dried fish = fish dried and preserved by exposure to sun and wind.

sun-leistering = using a leister, *q.v.*, to spear fish when they are dazzled by sunlight.

sunk gillnet = set gillnet (a gill net fixed to the bottom or a distance above it by anchors or ballast. Also called anchor net, straight net, sunk gillnet, sunken gill net, sunk net).

sunk net = a gill net with the head line below the water surface.

sunken gill net = sunk net.

Suo = the photophore on the posterodorsal border of the orbit in Myctophidae.

*sup. cit.* = abbreviation for *supra citato*.

super grouper = bubba (a Queensland grouper fish that died on 22 August 2006 at the Shedd Aquarium, Chicago. He was given to the aquarium in 1987 by an anonymous donor and at that time was a female about 10 inches long but, being a protogynous hermaphrodite, became male in the mid-1990s and eventually grew to be 69.3 kg. Bubba was famous for probably being the first fish to receive chemotherapy to treat a growth on his forehead. He was a favourite with visitors, especially children with cancer).

super seiner = a large purse seiner, over 70 m long, with its own freezing and storage facilities.

super- (prefix) = see supra.

super-pharyngeal = pharyngobranchial (the deep, endochondral bone at the top of the gill arch. May bear the upper pharyngeal and a dentigerous plate. May occur on arches 1, 2, 3, 4. Also called superior pharyngeals. Suprapharyngobranchials are never associated with teeth while infrapharyngobranchials may be associated with dermal plates bearing teeth).

superchilling = rapid and uniform cooling of fish at sea to a few degrees below zero and maintaining the fish under carefully controlled conditions.

superciliary = 1) above the eye, "eyebrow".

superciliary = 2) adnasal bone (a small dermal bone in front of the nasal bone in some fishes, e.g. the middle bone of three in the nasal region of *Lepisosteus*).

superfamily = 1) a category of the family-group above family; the highest category dealt with in the International Code of Zoological Nomenclature.

superfamily = 2) an individual taxon of the category "superfamily. The recommended ending is -oidea.

superfetation = the simultaneous development of several broods within the ovary where they are nourished; enabled by the entrance and storage of sperm in the ovary, e.g. in Poeciliidae. Also spelled superfoetation.

superficial neuromast = sense organs found in the epidermis. See also canal neuromasts and small pit organs. Also called free neuromasts or large pit organs.

superflock = a particularly diverse species flock, e.g. the more than 500 endemic haplochromine Cichlidae in Lake Victoria, east Africa.

superfluous name = a name incorrectly applied to a taxon. When first applied the taxon included the type of another name which should have been used under the provisions of the International Code of Zoological Nomenclature (*nomen superfluum*).

superimposition = redd construction in gravel already used by the same or a different species before the eggs of that species have hatched.

superior = above, dorsal, upward.

superior pharyngeal = pharyngobranchial (the deep, endochondral bone at the top of the gill arch. May bear the upper pharyngeal and a dentigerous plate. May occur on arches 1, 2, 3, 4. Also called super-pharyngeals. Suprapharyngobranchials are never associated with teeth while infrapharyngobranchials may be associated with dermal plates bearing teeth).

superior rank = the next higher category in the nomenclatural hierarchy to which a taxon is assigned.

superior taxon = a taxon of higher rank than the one with which it is compared.

superline = a strong, braided line made of modern plastics.

supermale = a male which does not change sex and is the principal spawner, e.g. in *Gonostoma bathyphilum*.

supernumerary = superfluous or extra. Used in referring to a sneaky or accessory male in reproduction or in reference to extra elements in larvae that are lost in adults, e.g. myctophid larvae have more pectoral fin rays than adults.

supernumerary annulus = in scale reading, an annulus in excess of a normal number.

supernumerary mark = a mark on an otolith, scale or bone not used in age estimation; an aperiodic mark.

supernumerary ring = supernumerary mark.

supernumerary zone = supernumerary mark.

superlateral = between the upper surface and the side, dorsolateral.

superspecies = a monophyletic group of allopatric species that are too distinct to be regarded as a single species; a cluster of incipient species (semispecies).

supplemental bone or maxillary = supramaxilla.

supplemental feeding = fish fed with artificial food and nutrients to obtain better fish production.

supplementary caudal keel = keels above and below the main, mid-lateral keel on the caudal peduncle, e.g. in Gempylidae.

supplementary rank = one of the categories of a rank to which organisms can be referred. This is not mandatory, e.g. the use of a subgenus name is not required in a genus divided into subgenera.

supplementary type = a described or illustrated specimen used to give additional information about a previously described species.

supplementation = the release and management of artificially propagated fish in streams with the intent to increase or establish wild fish populations while minimizing associated genetic and ecological risks.

supply channel = a channel running along the side of an aquaculture pond, feeding it with water. See also bypass channel.

supply glut = an abundance of fish on the market that strains the commercial system and causes prices to drop very low.

support = any operation by a vessel assisting fishing by foreign or national vessels, including supplying water, fuel, provisions, fish processing equipment, or other supplies to a fishing vessel.

supported cast net = a cast net too heavy to be used by hand and so is operated from a boat with supports.

suppressed work = a work that the International Commission on Zoological Nomenclature has ruled to be unpublished or unavailable. Also called *opera utique oppressa*.

suppression = a form of invalidation. A name which would be valid according to strict application of the rules of the International Code of Zoological Nomenclature, may be expressly suppressed by the Commission under its Plenary Powers, to allow validation of another name, which would not otherwise have been valid (i.e. according to the rules of the Code); converts a previously valid name into an invalid one. Names or works may be totally (never used) or conditionally suppressed.

*supra cit.* = abbreviation for *supra citato*.

*supra citato* = cited above. Abbreviated as *sup. cit.* and *supra cit.*

supra- (prefix) = above, on top of, over, greater.

supra-basidorsal = supradorsal.

supra-interdorsal = supradorsal.

supraanal photophore = one of a series of ventrolateral light organs above the space between the ventral and anal fins in Myctophidae. Abbreviated as SAO.

supraangular = coronomeckelian (a small bone on the postero-lateral part of Meckel's cartilage of the lower jaw. Often a point of insertion of the adductor mandibulae muscle. Also called sesamoid angular, sesamoid articular, articular sesamoid, splenial, os meckeli or *d* bone).

suprabranchial chamber = a cavity into which the air-breathing organ, the labyrinthine organ, extends, in *Anabas testudineus* (Anabantidae)

supracaudal luminous gland = a long median photophore on top of the caudal peduncle behind the adipose fin in Myctophidae (SCG in illustration).

supraclavicle I = posttemporal (the superficial, Y-shaped dermal bone connecting the pectoral girdle with the skull, namely the epiotic or supraoccipital (upper part of the bone) and the opisthotic (in primitive fishes) or the intercalar (in modern fishes)(lower part of the bone). Traversed by the posttemporal lateral line canal. Also called suprascapula, suprascapular and supracleithrum I).

supracleithra = plural of supracleithrum.

supracleithral head spine = a spine on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

supracleithrum (plural supracleithra) = the paired dermal bone of the secondary pectoral girdle above the cleithrum and below the posttemporal. Also called hypercleithrum.

supracleithrum I = posttemporal (the superficial, Y-shaped dermal bone connecting the pectoral girdle with the skull, namely the epiotic or supraoccipital (upper part of the bone) and the opisthotic (in primitive fishes) or the intercalar (in modern fishes)(lower part of the bone). Traversed by the posttemporal lateral line canal. Also called suprascapula, suprascapular and supraclavicle I).

supradorsal = a cartilaginous element on top of the neural canal of Elasmobranchii and Holocephali. Consists of supradorsals or neural spines over the basidorsals and supra-interdorsals lying over the interdorsals.

supraethmoid = one of the paired dermal bones above the ethmoid, anterior to the frontals. Also called dermethmoid, dermal ethmoid, mesethmoid, dermal mesethmoid rostral.

suprageneric = above the rank of genus.

supralingual = lingual plate (a dermal toothed bone covering and sometimes fusing with the basihyal, e.g. in Osteoglossidae. Also called glossohyal, dermentoglossum, entoglossum, os entoglossum, supralingual or basihyal dental plate).

supramaxilla (plural supramaxillae) = the dermal bone(s) on the upper side of the posterior end of the maxilla. Salmonidae have one supramaxilla while Sternopychidae have two. Lost in more advanced Teleostei. Also called supramaxillary, surmaxilla, surmaxillary, malar and jugal.

supramaxillae = plural of supramaxilla.

supramaxillary = supramaxilla.

supraneural = one of a median series of detached rods lying in the flesh between the head and the dorsal fin, and presumably representing detached neural spines (also used for vestigial pterygiophores or predorsals).

supraneural element = a columnar bone under the second pterygiophore in Balistidae. It supports the third dorsal spine (and is not a supraneural).

supraoccipital = a median, mixed-origin bone at the upper rear end of the cranium, often bearing a crest, and forming the upper edge of the foramen magnum. In most bony fishes its origins are from the ossification of the otic roof (tectum synoticum) and the connective median septum separating the anterior trunk muscles. Absent in Chondrostei and Holostei.

supraoccipital hook = a structure in male *Kurtus gulliveri* (Kurtidae) used for carrying of an egg mass. The hook projects from the dorsal surface of the head and is directed anteriorly and downward nearly forming a closed ring. This hook is formed from the supraoccipital and modified dorsal spines. Females lack a hook. Eggs are carried like a cluster of grapes on the forehead. The epidermis in the cleft of the hook is folded into crypts and lacks secretory and neurosensory cells. The dermis is highly vascularized and engorgement of this area with blood may help hold the egg mass in place.

supraocular = above the eye.

supraocular head spine = a spine on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

supraopercular = any of the small tube bones conducting the dorsal extension of the preopercular laterosensory canal across the gap between the preopercular bone and the supratemporal canal above.

supraoral = above the mouth; said of teeth above the oral opening in Petromyzontidae.

supraoral lamina = a plate bearing teeth above the mouth in Petromyzontidae.

supraorbital = above the eye.

supraorbital bone = one of the 1-3 dermal bones of the circumorbital series forming, when present, the dorsal margin of the orbit and lacking sensory canals. The fossil Pholidophoridae had 3 supraorbitals, many modern fishes have 1 or 2, *Amia* and more advanced Teleostei have none.

supraorbital canal = the cephalic sensory canal (q.v.) extending from above the eye to the nostrils. Abbreviated SO.

supraorbital photophore = a light organ on the posterodorsal margin of the orbit in Myctophidae. Abbreviated SuO.

supraorbital pore = a head canal pore above the eye.

suprapelos = organisms swimming above mud that are dependent on it for food.

suprapericardial gland = a thyroid gland.

suprapharyngobranchial = pharyngobranchial (the deep, endochondral bone at the top of the gill arch. May bear the upper pharyngeal and a dentigerous plate. May occur on arches 1, 2, 3, 4. Also called super-pharyngeals or superior pharyngeals. Suprapharyngobranchials are never associated with teeth while infrapharyngobranchials may be associated with dermal plates bearing teeth).

suprapreopercle = a small, paired dermal tube bone carrying the lateral line canal across the gap between the preopercle and supratemporal, often absent. Also called supratemporal, subtemporal and suprapreoperculum.

suprapreoperculum = suprapreopercle.

suprapsammon = organisms swimming above sand that are dependent on it for food.

supratemporal = suprapreopercle.

suprapterygoid = the upper deep bone of the palatoquadrate in Palaeoniscids.

suprascapula = posttemporal (the superficial, Y-shaped dermal bone connecting the pectoral girdle with the skull, namely the epiotic or supraoccipital (upper part of the bone) and the opisthotic (in primitive fishes) or the intercalar (in modern fishes)(lower part of the bone). Traversed by the posttemporal lateral line canal. Also called suprascapular, supracleithrum I and supraclavicle I).

suprascapular = suprascapula.

supraspecific = above the rank of species.

supraspinous artery = an artery running antero-posteriorly at the dorsal tips of the neural arches.

supratemporal bone = extrascapula (small bones bordering the posterior margin of the skull roof in primitive Teleostomi. They apparently originate from enlarged scales. One of a series of from 2-8 bones known variously as cervicals, nuchals, postparietals, scale bones or tabulars).

supratemporal canal = the cephalic lateral line canal (*q.v.*) running across the top of the head joining the lateral canals. Abbreviated ST.

supratemporal-intertemporal = a dermal bone overlaying the pterotic (or autopterotic). Also called intertemporal, membranopterotic or dermopterotic.

supratidal = above the high tide level, essentially a terrestrial habitat.

supraventral photophore = a photophore on the side below the lateral line and above the base of the pelvic fin in Myctophidae. Abbreviated VLO.

supreme cut = a slice cut off a fillet, often at a slant. Now sometimes called a pavé (slab or block), a term usually used for cakes and desserts.

sur = supra-.

surangular = the paired dermal bone of the lower jaw covering the articular dorsally.

surf = breakers or the wave activity between the shore line and the outermost limit of breakers; a habitat for certain fishes.

surf fishing = fishing from a beach through the surf but may also include from a pier or jetty.

surf rod = a long rod (12 feet) used with a large reel and a long line to cast a heavy rig several hundred feet out to sea from the shore.

surf zone = surf.

surface drift = allowing a gill net to drift in surface waters, usually with the float line at the surface.

surface feeder = a fish that takes its food from the air/water interface, or feeds just below the water surface.

surface fishing = 1) a form of angling where floating baits are used such as dog biscuits or bread flakes.

surface fishing = 2) a commercial fishery targeting tuna and billfishes using surface gear such as longlines, baitboats, purse-seine and harpoons.

surface gill net = a set gill net fixed to fish near the surface. Also called anchor surface net.

surface layer = the upper layer of a water body, mixed by wind, waves and currents.

surface net = a fishing net with the upper line set at the sea surface.

surface set = the operation of a gill net when designed and laid out for use in surface waters.

surface trawl = a floating trawl pulled by two boats and used in shallow water.

surface water = 1) water collecting on the surface of the ground.

surface water = 2) the surface layer of a body of water.

surfcasting = fishing from or near the surf or on a beach using a fishing rod with an elongate butt enabling long and precise casts.

surfeit of lampreys = the meal that reputedly killed Henry I of England in 1135. The flesh is said to be fatty and not easily digested.

surge channel = a deep channel through which water moves in and out.

surge pool = a rock pool situated at low tide level and partially open to the sea such that water flows in and out except during the calmest weather.

surgeon knot = a strong knot for tying tippets to leaders or segments of tippets. Not as smooth as a blood knot but stronger.

surimi = a processed Japanese fish mince used to produce kamaboko, fish sausage and crab sticks. Mixed with cryoprotectants such as sugar and sorbitol for an extended shelf life.

surmaxilla = supramaxilla.

surmaxillary = supramaxilla.

surplus = 1) in a fisheries sense, the number of fish in excess of those needed to maintain a population at some level.

surplus = 2) returning hatchery fish in excess in broodstock that may be given to tribal groups as part of their treaty rights, transported elsewhere for anglers to catch, donated to food programmes, sold to support hatchery programmes or, if in poor condition, converted to fish meal for hatchery feed, placed in streams for nutrient enrichment, given to wildlife rehabilitation centres or discarded. Such hatchery fish, not caught by anglers, are used as outlined above so that they do not compete with native fish for spawning sites, food or shelter nor do they breed with native fish and produce less fit populations.

surplus production = production of new weight by a fishable stock, plus recruits added to it, less what is removed by natural mortality. Usually estimated as the catch in a given year plus the increase in stock size or less the decrease (Ricker, 1975). As a stock is fished, the biomass is lowered, the fish have less competition for food and other resources, growth and reproduction improves, fish are healthier, and the age composition is biased towards younger fish. Younger fish grow faster and increase the stock's productivity. Abbreviated as  $Y'$ . Also called natural increase, sustainable yield, equilibrium catch.

surplus production model = an estimate of the catch in a given year and the change in stock size. The stock size could increase or decrease depending on new recruits and natural mortality. A surplus production model estimates the natural increase in fish weight or the sustainable yield.

surplus production model - survival rate(s) = the number of fish alive after a specified time, divided by the number alive at the beginning of the period.

surrounding net = a surface net supported by floats which traps fish both underneath and from the sides. There is a purse line at the net bottom which closes the net and prevents fish escaping downward. See also purse seine, lampara net.

surrounding gill net = a coastal Japanese net comprised of gill nets inside a surrounding net. The surrounding net is set from boats around a fish school, the gill nets are lowered into the

enclosed space that is formed, and fish driven into them from the surrounding net mouth by boats.

sursild = brine-salted herring pickled in a spiced solution of vinegar and sugar with sliced onions added (Norway).

surströmming = a Scandinavian preparation of canned, sour or fermented herrings. Only a little salt was used to prevent rotting as, in the past, it was expensive when the fish were packed in barrels. The barrels are left to ferment with a space at the top to accommodate gas production, and later the herrings are packed in cans. Some fermentation continues in the can. There is a very strong smell when the bulging can is carefully opened, cf. lutefisk.

survey = collection of data controlled by scientists, e.g. collecting fish from research vessels using a scientifically designed programme.

survival flow = the discharge required to keep fish alive in a stream during short periods of time of extremely low flow.

survival rate = number of fish alive after a specified time interval, divided by the initial number, usually on a yearly basis. Abbreviated as S (Ricker, 1975).

survival ratio = ratio of recruits to spawners or parental biomass in a stock-recruitment analysis. Changes in survival ratios indicate that the productivity of a stock is changing.

survivorship curve = a curve used in life expectancy statistics.

sushi = thin slices of raw fish, usually with green mustard and vinegar-boiled rice; a Japanese delicacy. Also fermented pickled fish, boiled rice and salt. Strictly sushi is the sweetened, pickled rice while the fish is sashimi. When combined sold as sushi.

suspended fish = in angling, those fish at mid-level depths.

suspension feeder = an organism feeding on particulate matter suspended in water.

suspensiphagy = feeding on the smallest suspended particles at 5-10 µm.

suspensoria = plural of suspensorium.

suspensorium (plural suspensoria) = the chain of cartilages and bones from the hyomandibular to the palatine, suspending the jaws from the neurocranium.

suspensory bone = a bone by which the jaw is attached to the skull.

suspensory ligament = ligaments in the eyeball suspending the lens.

sustainability = the ability to persist in the long-term; see sustainable catch, sustainable use.

sustainability certificate = a certificate or other indication that the fish on sale come from a sustainable catch, e.g. the Marine Stewardship Council has a blue tic and fish logo that is placed on packages of mackerel and herring caught in the sustainable Scottish fisheries.

sustainable catch = the number or weight of fish in a stock that can be taken by fishing without reducing the stock biomass from year to year, assuming that environmental conditions remain the same.

sustainable fishing = sustainable use.

sustainable use = the use of parts or the whole of a fishery over the long term at a rate that does not lead to a decline, preserving it for future generations.

sustainable yield = the yield (in weight or number) taken from a fish stock when it is in equilibrium with fishing of a given intensity, and (apart from effects of environmental variation) its biomass is not changing from one year to the next. Also called equilibrium yield, equivalent sustainable yield.

sustained harvest = a harvest volume that can be maintained through time without decline.

sustained speed = the swimming speed that a fish can maintain for prolonged periods but ultimately tires and shows some degree of stress. Also called prolonged speed.

sustained use = continuing use without severe or permanent deterioration in the fishery resource.

sustaining specimen = auxiliary type (a specimen or element to serve as type of a subordinate taxon when the type of a major taxon is inadequate to assign subordinate rank names to the type).

sustenance ratio = the ratio of protein, and fat and carbohydrate, as a food requirement, e.g. low or 1:2 for trout, medium or 1:5 for common carp and high 1:8 for grass carp.

sutki = salted or unsalted sun-dried fish, sometimes hard-smoked fish (India and Pakistan).

suture = ragged line of union between two bones cemented with connective tissue, allowing no movement.

swad = a bushel basket used in selling fish (Sussex dialect).

swallow a gudgeon = to be fooled by an obvious lie as gudgeons (*Gobio gobio*, Cyprinidae) are used as bait to trap other fish. See also gaping for gudgeons.

swallow piece = extension piece (tapered sections of netting between the belly and the batings and the cod end of a trawl. Also called pipe, tail, tail piece, taper, Y-piece).

swallow-tail = a cod with an angular cut made in the tail to mark ownership (Newfoundland).

swalten = sweltin.

swamp = 1) a type of wetland that is dominated by woody vegetation and does not accumulate appreciable peat deposits. Swamps may be fresh water or saltwater and tidal or nontidal.

swamp = 2) a small, flat-bottomed row-boat (Newfoundland). Also called swamp bottom.

swamp bottom = swamp (2)

swamper = a large boat-load of fish (Newfoundland). Also called sagger.

Swampscott dory = a 14-18 foot dory made in New England and Nova Scotia. The longer version was rowed by two men. The bottom of this dory is flat but narrow with an almost round bottom, allowing it to sit on a sandy beach. Now often modified into a recreational sailboat and rowboat.

swarm = 1) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for eels.

swarm = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for minnows.

swash = run-up (the rush of water up a structure such as a beach on the breaking of a wave. Also called uprush).

swathe = the milt, or sperm vessels in a male cod (Orkney dialect).

sweat = 1) moisture exuded from the fish while cooling after smoking and liable to encourage moulds if the product is packed while still hot.

sweat = 2) exudation of salt in the curing process; to spread thoroughly through the fish by pressure of the pile.

Swedish pimple = a fresh and marine water jigging lure, some forms of which are used in ice fishing.

sweel = a swirl, spin or twist often used to describe the rapid movement of a fish with its tail (Scottish dialect). See also swill (2).

sweep = ground cable (the length of wire or rope connecting the otter boards to the wings or towing bridle of a trawl net).

sweep net =beach seine (a net used to encircle fish in shallow water; usually operated by two people wading out from shore, the net has lead weights to keep the bottom on the sea floor and floats to keep the top of the net at or near the surface; there may be a bag extending back from the centre of the nets length to increase capture efficiency. The seine may be set from a boat but hauled in from the land. Also called shore seine, drag seine, draw net, haul seine and yard seine).

sweet jigging = ripping side (setting hooks every ten feet on a drifting line intended to snag a fish).

sweet water = potable water.

sweltein = a hungry, lean or emaciated cod (Scottish dialect). Also spelled swalten.

swill = 1) the milt of fish, especially a cod (Orkney dialect).

swill = 2) a swirl, spin or twist often used to describe the rapid movement of a fish with its tail.  
See also swwel.

swim = 1) the movement of fish in water.

swim = 2) the area an angler fishes. Used in Europe where anglers fish a limited area using float rigs.

swim = 3) in the swim, meaning in the upper crust of society.

swim = 4) of fish, to be present in a particular stretch of water.

swim bait = a soft, plastic lure resembling a baitfish.

swim bladder = gas bladder (a thin membranous, sometimes alveolated sac in the dorsal portion of the abdominal cavity. Composed of three layers, the tunica externa, the submucosa or middle layer and the tunica interna, all q.v. Contains a varying mixture of gases, not identical to the composition of air. May be one, two or three chambered. May be connected to the gut by a tube, the ductus pneumaticus (then called physostomous) or unconnected (then called physoclistous). May function as one or more of:- hydrostatic organ, sound producing organ, sound receptor, respiratory organ. Found in Actinopterygii. Often lacking in bottom fishes. Sometimes called swim bladder, also a less appropriate term. An item in Chinese cuisine. Used to make isinglass, q.v.).

swim bladder disease = changes in pressure or temperature in tropical fishes that affects that internal organ responsible for maintaining equilibrium; the fish may rest on the bottom or float on the surface.

swim bladder infection = an acute haemorrhagic viral infection with a rhabdovirus. Symptoms include loss of coordination and equilibrium, popeyes, swollen belly, inflamed and swollen vent, and oedema and haemorrhages of various organs, particularly the swim bladder.

swimbladder = swim bladder.

swimbladder fenestra = a thinner portion of the swimbladder wall anteriorly, lacking the submucosa layer, e.g. in *Carapus* (Carapidae). Presumably the sonic muscles move this part of the swimbladder and cause sound production.

swim-up fry = fry that have absorbed their yolk sac, are ready to start feeding and rise to the surface to gulp air into the swim bladder (stages at 45°F in chinook salmon are green = 0 days, eyed = 38 days, sack fry = 69 days, swim up = 92 days and button up = 115 days).

swimfeeder = a weighted plastic container added to a fishing line and filled with groundbait or maggots to attract fish to the neighbourhood of the hook and its bait by slow release of the attractive contents. See also feeder.

swimmers and bricks = fish and chips (Irish slang).

swimming bait = an artificial bait made to resemble a swimming fish by its vibrating or wobbling action or even rattling. Also called lipless crankbait.

swimming lure = swimming bait.

swimming speed = the speed at which fish swim; in the range of 0 to >6 m/s and often expressed as body length per second. Burst or dart speed can be maintained for 5-10 seconds, to capture prey, escape predators, leap falls. Prolonged speed is anaerobic and can be maintained for some minutes but usually less than an hour as fatigue sets in. Sustained or cruising speed is aerobic can be maintained almost indefinitely.

swimming with the fishes = 1) a pleasant past-time.

swimming with the fishes = 2) when involving concrete shoes and the criminal element, not so pleasant.

swims with sharks = 1) humans swimming with real sharks as research or tourism.

swims with sharks = 2) humans engaging in dangerous behaviour of any kind and including political and cultural activities, not involving actual sharks usually.

swing indicator = a means of detecting bites when angling. The indicator has an upwards-facing, open-end clip attached to a stiff bar anchored on a bankstick. The clip is placed on the fishing line and pulled half way down. A fish taking the bait and swimming away will pull the indicator up, one swimming towards the angler will cause the indicator to drop down. The indicator can be attached to the base of electronic bite alarms.

swing net = 1) stow net.

swing net = 2) a gill net set close to the shore, anchored by a grapnel around which it swings with the tide, but remaining stretched out.

swing tip = a device attached flexibly by a rubber hinge to the tip of a fishing rod, has ring guides for the line but hangs down. The swing tip is pulled up by a bite.

swinging sickness = peculiar shaking or swinging movements made by fish while maintaining station; not due to any known disease. Also called shimmy or shimmies.

swivel device = a swivel (a pair of freely rotating metal rings separated by a central body) attached to fishing line to prevent line twist caused by a rotating lure.

swivel double = a knot used by anglers to attach a swivel to a double loop. Various websites have animated steps showing how to tie this knot.

syle = young herring (*Clupea harengus*).

symbiosis = the living together of two species to their mutual benefit, e.g. luminescent bacteria in photophores of certain fishes; hydroid polyps which grow on and camouflage *Minous*; and anemone fish (*Amphiprion*) with sea anemones, where the territorial fish protects the sea anemone from other fish that try to eat it and the sea anemone's nematocysts or stinging cells protects the fish against its predators (mucus on the anemone fish protects it from the nematocysts). See also commensalism.

symmetrical = divisible by a plane through the centre into similar parts, each side a mirror image of the other, e.g. bilateral symmetry.

symmorid = a form of early shark tooth, similar to cladodont teeth with a main central cusp and smaller lateral cusps, but appearing later in the fossil record (late Devonian). See also diplodont, cladodont and hybodont.

sympagic = organisms living with sea ice.

sympathetic nerve chain = a chain of ganglia medial to the ribs within the body cavity. They are connected to the spinal nerves by rami communicantes.

sympatric = sharing, at least in part, the same geographical range.

syphyses = plural of symphysis.

symphysial groove = a longitudinal furrow originating behind the lower jaw symphysis in some sharks.

symphysial knob = a swelling on the tip of the lower jaw.

symphysis (plural symphyses) = the joining point between two bones effected by cartilage allowing a slight movement, e.g. joint between the tips of the lower jaw bones, the mandibular symphysis.

symphysis mandibulares = plural of symphysis mandibularis.

symphysis mandibularis (plural symphysis mandibulares) = mandibular symphysis (the joint between the left and right mandibles at the jaw tip).

symplectic = the small, paired, deep, endochondral bone joining the quadrate and the hyomandibular and supporting the interhyal in the hyostylic jaw (q.v.). It is cartilaginous in *Acipenser* and absent in *Siluroidei* and *Anguilloidei*.

symplesiomorphy = a character shared by two or more organisms or groups and inherited from a remote or much earlier common ancestor (shared primitive character). Diagnoses a paraphyletic group.

syn. = abbreviation for synonym or synonymy.

*syn.* = abbreviation for synonym or synonymy.

*syn. nov.* = *synonymum novum*.

*syn.-* (prefix) = joined, associated, together, fused, united.

**synapomorphy** = a character shared by two or more organisms or groups and inherited from an immediately preceding or recent common ancestor (shared derived character). Diagnoses a clade or monophyletic group.

**synapotypy** = common possession of a derived character state.

**synarthrosis** = an articulation allowing very little movement as between the two mandibles at the jaw tip; *cf.* amphiarthrosis and diarthrosis.

**synchronomorial denticle** = found in Elasmobranchii and Holocephali.

**synchronous hermaphrodite** = an organism with simultaneously developed ovarian and testicular tissue, e.g. *Hypoplectrus unicolor* (Serranidae).

**synchronous spawning** = mass release of eggs all at once, *cf.* serial spawning.

**syncrania** = plural of syncranium.

**syncranium** (plural syncrania) = the whole skull of a fish, comprising the neurocranium, dermocranum and branchiocranium.

**syndicate** = a group of anglers paying an annual sum for exclusive rights to fish a stretch of water. Numbers of anglers are usually limited.

**synecology** = the ecology of communities rather than individual species.

**synonym** = one of two or more names having the same name-bearing epithet (basionym).

**synonym** = each of two or more names with different spelling applied to one and the same taxon. The junior synonym is that with the later, the senior synonym is that with the earlier, publication date. Objective synonyms are the two or more synonyms used on the same type. Subjective synonyms are the two or more synonyms based on different types, but which are regarded as referring to the same taxon by those zoologists who hold them to be synonyms.

**synonym for fish** = denizen of the deep, finny prey, finny tribe, one of the finny tribe.

**synonymotype** = the constituent or element of a taxon quoted by the author as being identical with his/her newly established taxon.

***synonymum*** = synonym. Abbreviated *syn.*

***synonymum novum*** = new synonym, used when a name is treated as a synonym for the first time. Abbreviated *syn. nov.*

synonymy = 1) the relationship between different names designating the same taxon.

synonymy = 2) an organized list of the synonyms applied to a given taxon including authors and dates.

synopsis = 1) a brief description of the main characters of a taxon.

synopsis = 2) a summary of current knowledge.

synoptic collection = a collection comprising one or everything related to a topic, e.g. a local fish fauna.

synthetic table = synoptic table.

synthetograph = an unofficial term in nomenclature for an illustration made from two or more individuals in a type series.

syntopic = two or more species commonly occurring together.

syntype = 1) every specimen in a type-series numbering two or more in which no holotype nor a lectotype has been designated. The syntypes collectively constitute the name-bearing type.

syntype = 2) an obsolete term for a specimen other than the holotype on which an original description was based.

siphon = siphon.

system = the arrangement of groups in relation to each other as in a classification.

systematic collection = museum specimens selected as examples of significant types or variants within a collection category.

systematics = the study and classification of organisms into hierarchies and their phylogenetic interrelationships; that field of biology covering the diversity of life.

systematics collection = a collection used in systematics research; usually one comprised of specimens from an area or from a taxon.

syver = a side-channel for salmon ascending a river, or the grille or trap on this channel (Scottish dialect). Also spelled siver.

## T

T = Tertiary, a geological period of the Cenozoic Era ca. 65-16 million years ago comprising the Palaeocene, Eocene, Oligocene, Miocene and Pliocene.

T<sub>R</sub> = Triassic, a geological period of the Mesozoic Era ca. 245-210 million years ago.

t = abbreviation for tonne (metric ton, 1000 kg, 2204.62 pounds (lb), 0.984 long tons, 1.102 short tons. Often spelled ton, confusingly).

t. = abbreviation for *tabula*.

t. = abbreviation for *teste*.

t. = abbreviation for *tomus*, meaning volume.

t. c. = abbreviation for *tomus citate*.

t-cut = a cut in netting parallel to the general course of the netting. Also called mesh cut.

T-net = a type of intertidal and coastal stake-net used for salmon on the east coasts of Scotland and northeast England. The net is set across the outer end of a leader wall of netting thus forming a 'T' shape.

tab = any flap-like extension such as the opercular flap in Centrarchidae.

tab. = abbreviation for *tabula*, meaning table.

table fish = edible fish of some appropriate size.

table flake = a platform, about four feet above ground, used to spread and dry cod (Newfoundland).

tablemount = a seamount (*q.v.*, (2) rising more than 500 fathoms from the sea floor and having a mostly smooth, flat top.

taboo word = certain words are not used by fishermen for superstitious reasons, e.g. names of fishes, and are replaced by other words. In Yorkshire, taboo words on trawlers include other words not associated with fishing, e.g. pig, egg, cat, knife, rat, clergyman, etc. Seems to refer both to the word not spoken and the replacement word.

*tabula* = table; a plate (usually numbered). Abbreviated as *tab*.

tabular bone = extrascapula (a small bone bordering the posterior margin of the skull roof in primitive Teleostomi. These bones apparently originate from enlarged scales. One of a series of from 2-8 bones known variously as cervicals, nuchals, postparietals, scale bones or supratemporals. Often small and thin dermal bones on the nape or above the opercular membrane related to the supratemporal sensory canal).

tabulate = having a flat surface.

TAC = abbreviation for total allowable catch, the weight of fish of a given species or type caught by commercial fishing in any year. The TAC is set by a government in an effort to manage the resource. Pronounced by the initials, not like "tack".

TACC = abbreviation for total allowable commercial catch (total allowable catch)

tachener = takener.

tachy- (prefix) = fast, quick.

tachygen = a structure that suddenly appears during the evolution of a lineage.

tacked = said of a fishing-net caught in the bottom of a river (English dialect).

tackle = 1) the gear used by an angler or a commercial fisher to catch fish.

tackle = 2) to fish with a net (Newfoundland).

tackle = 3) to catch with fishing tackle.

tackle box = a box or bag designed to hold fishing gear, usually with a series of compartments. Some are made of wicker and large and sturdy enough to sit on for bank fishing.

tackle tart = slang for a rich angler.

tacksman = a lessee of coastal salmon fishings in Scotland.

tactition = pressure reception, e.g. as sensed by the skin.

tactile = relating to the sense of touch, e.g. said of barbels.

tae = a section of a deep-sea fishing line, having a specified number of hooks, generally 100 or 120, attached (Scottish dialect). Also spelled tie.

taeniform = elongate, compressed and deep-bodied, ribbon-like, e.g. ribbon fishes, oarfishes.

taft = pulling a fishing line up and down over the gunwhale to keep the bait in motion and attractive to fish (Scottish dialect).

tag = 1) any mark placed in or on a fish; may be a clipped fin, a numbered tag sewn on or punched into the fish, an electronic device, a hot or cold brand with letters and/or numbers, etc.

tag = 2) the act of applying a tag.

tag end = the working end of a line where the knot is tied.

tag loss = the proportion of fish in a tagging experiment that lose their tags. Fish can be doubled tagged so that recapture of such fish with only one tag can be compared to those caught with both tags.

tag o'skate = a slice of skate hung up to dry in the sun (Scottish dialect).

tag recovery = the ratio between the number of recovered tags and the total number of tags used on a given batch of fishes, usually given as a percentage.

tag return = tag recovery.

tagged fish = a fish bearing a tag.

tagging = attachment of numbered and addressed labels or tags, usually of plastic or metal, to a live fish which is then released and hopefully recaptured at a later date. Alternatively fins may be clipped in a marking system. Used to estimate growth, stock size, mortality and movement. Also called marking.

tagging mortality = death of fish occasioned by tagging through initial capture, handling and tagging and through long-term presence of a tag and its effects on a normal life style.

tagotype = an unofficial term in nomenclature for a type specimen known only from its label or tag, having been destroyed.

tail = 1) the part of the body posterior to the abdominal cavity, thus including the caudal peduncle and the tail fin.

tail = 2) the tail fin alone.

tail = 3) the length of line between the hook and a leger or paternoster.

tail = 4) to lift a fish by its tail. Also called tailing.

tail = 5) observation of fish in shallow water where the tail breaks the water. Also called tailing.

tail = 6) a stream section just after a pool and before the next rapids characterised by flat, slick and fast surface water.

tail = 7) the thin, tapered portion of fish fillet.

tail = 8) extension piece (tapered sections of netting between the belly and the batings and the cod end of a trawl. Also called pipe, swallow piece, tail piece, taper, Y-piece).

tail = 9) the southern extremity of a reef, sand bank or narrow, descending part of a fishing ground, e.g. the Grand Bank of Newfoundland. See also nose.

tail and fin rot = a bacterial disease of fish wherein the tail and fins are rotted away.

tail cloth = the bag at the rear of a fry-catching net.

tail end = tail cloth.

tail extension = in aquarium fishes, any lengthening of the lobe(s) of the caudal fin, e.g. swordtail, *Xiphophorus helleri*.

tail fin = the fin at the end of the body. Also called the caudal fin.

tail gland = a group of long, thick mucus cells at the tip of the tail of Heterocongridae which cements the sand of the walls of their burrows they fashion using their tails.

tail net = the herring net firsts set out or shot from the boat and thus the one farthest away.

tail out = the lower end of a pool where it becomes shallow.

tail piece = 1) extension piece (tapered sections of netting between the belly and the batings and the cod end of a trawl. Also called pipe, swallow piece, tail, taper, Y-piece).

tail piece = 2) tail cloth.

tail reticular cell = a cell lining the vascular channel network in the posterior and ventral tail, connecting the the caudal artery and vein. Serves for phagocytic cleaning of the blood.

tail ring = one of the dermal plates in members of the Syngnathidae forming a series of rings enclosing the body; tail rings run from the first behind the anus (it usually carries the anal fin).

tail rot = a bacterial infection seen in aquarium fish kept in poor conditions when an infection can be result from an injury. Tuberculosis can also lead to tail rot. Antibiotics in the food and water are used in treatment. See also fin rot.

tail spinner = compact, lead-bodied lure with one or two spinner blades attached to the tail and a treble hook suspended from the body. May have rattles. Also called lipless crankbait.

tail walking = a hooked game fish remaining mostly out of the water by rapidly moving its caudal fin from side to side at the water surface.

tail water = tailwater.

tail wrist = caudal peduncle (the wrist-like portion of the posterior part of the body between the end of the anal fin and the base of the caudal fin. Its length is measured between the insertion of the anal fin and the caudal flexure (the fold shown by the hind edge of the hypural plates when the caudal fin is flexed). Depth is measured vertically at the narrowest point).

tail-bud stage = an embryo with a prominent caudal bulge and marked cephalic development.

tail-free stage = an embryo with separation of the tail from the yolk.

tailing = 1) a method of handling a slippery fish by grasping it near the tail. Also called tail.

tailing = 2) observation of fish in shallow water where the tail breaks the water. Also called tail.

tailing glove = a glove used in tailing (1) made of a mesh of nylon, kevlar and stainless steel, originally for protection against knife cuts when filleting fish. The mesh facilitates grip through the slippery mucus but does not remove it as readily as dry hands.

tailing loop = a casting error with a fly rod causing a knot in the forward part of the tippet. Occurs when the rod tip dips under the straight line path, usually the result of a jerk forward at the end of the backcast. Also called wind knot.

tailrace = 1) the canal or channel that carries water away from a dam.

tailrace = 2) the area where separate currents join below an island.

tailspill = the area of a redd where excavated substrate is deposited, downstream of the redd.

tailwater = the area immediately below a dam where the river water is cooler than normal and rich in nutrients.

tailwater fishery = a fishery based on the tailwater area. Highly productive due to the relative constancy of environmental conditions and includes some of the world's greatest fisheries.

taint = an odour, flavour or rancidity in fish acquired from its food, association with other objects or from storage rendering it unsuitable for marketing.

take = 1) the moment when a fish takes the bait or fly; usually when the hook should be set by jerking the rod or pulling on the line unless the fish species is one that first mouths the bait or draws it in and out before taking it fully into the mouth.

take = 2) disturbing, capturing, killing or attempting to kill fish.

take = 3) the act of landing a fish dead or alive or of bringing fish on board a vessel.

take = 4) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

take = 5) to prepare fish for curing or cooking.

take = 6) the amount of fish caught.

take the yarn = said of herrings when they strike the net.

take up = said of a name in nomenclature where it is validly published after being devaluated or used invalidly.

take-out = the area where boats are taken out of the water.

takener = a young man employed on a fishing boat (Sussex dialect).

tal qual = talis qualis. Also all quall, tal squal and tol squoll.

tal squol = talis qualis.

talis qualis = Latin for just as they come, e.g. a whole catch of dried and salted cod sold without differentiation of quality or size (Newfoundland).

tally = an added herring to the warp (three fish), added to a retail amount of fish to make up for broken or damaged fish. See hundred and tally.

tally board = a plank or wooden table on which dried cod were placed for counting and grading (Newfoundland).

tally fish = a cod with unique colour markings on its back that resemble the slanted strokes made in keeping count. Tally fish were thought to presage a good catch (Newfoundland).

tally stick = a stick on which amounts of herring caught were registered in the Isle of Man. A notch was made for each basket of 124 fish and a cut across four notches indicated five baskets (620 fish). Theft of a tally stick by a rival crew took the boat's luck went with it, and it had to be recovered, if possible, by force or guile.

tallying = keeping a count or record of the number of fish caught or received by a merchant.

tambak = brackish water pond used for rearing herbivorous fishes in Indonesia.

Tancook whaler = a carvel vessel 28-40 feet long with a crew of two, moveable ballast, a shelter amidships but no crew accommodation. This was one of the vessels known as a double-ender because the stern was pointed. The Tancook Islands in Nova Scotia have no natural harbours and the boats had to be moored offshore year-round and capable of surviving rough weather. Could be rowed 5-6 miles or more to the fishing grounds in the morning in calm weather and sailed home. Used in Nova Scotia from the 1860s to the turn of the century for fishing trips of 2-3 days. Used in the spring mackerel run, and in handlining for cod, pollock and haddock, and sometimes in otter trawling.

tamlín-cod = a young cod fish (Cornish dialect).

tang = the Persian version of a canyon (a deep gorge with steep sides and often a stream, characteristic of arid and semi-arid regions).

tangle net = a bottom net attached to a headline much shorter than the length of the netting so that the net hangs in folds. Fish are gilled or more usually entangled.

tank = 1) a fish or water holding structure of varying size and construction material, from an aquarium to a large outdoor pond.

tank = 2) in a museum, a large rectangular container for storing fluid-preserved specimens. Usually of stainless steel as wood and plastic containers eventually deteriorate.

tank raised = fish bred and raised in a home or commercial aquarium.

tank salted fish = fish treated with salt in a watertight container so that the fish are cured in the pickle that is formed. Also called pickle cured fish and a variety of other names based on the container used and the pickle effect.

tanning = treating nets with some preservative (before modern materials were invented).

*tantum* = only, merely. See *nomen tantum*, for example.

taper = 1) an area that slopes gradually and evenly towards deeper water.

taper = 2) extension piece (tapered sections of netting between the belly and the batings and the cod end of a trawl. Also called pipe, swallow piece, tail, tail piece, Y-piece).

tapered leader = a piece of line, 6-10 feet long, connecting the heavy fly line to the fly, tapering from thick (30-40 lb or 0.022-0.024 inches in diameter), where tied to the fly line, to very light at the fly. This last portion is called the tippet. Tapered line is needed as the main fly line is very thick and would be detected easily by the fish. Available in various configurations and strengths but since it is a continuous piece of manufactured line it is supposedly stronger than a series of discrete pieces of line tied together by knots.

tapered line = a fishing line that decreases in diameter towards both ends (double taper) or towards one end (weight forward).

tapetum lucidum = a silvery layer in the choroid of the eye (Elasmobranchii and some marine teleosts) or within the retina (some Cyprinidae, Percidae and many bathypelagic species). Formed of guanine. Probably acts to reflect light back through the retina to increase the stimulus.

taphonomy = the study of the processes of burial and fossilisation.

tapioca disease = a parasitic disease of Pacific salmon.

tar pot = a heavy iron vessel with heated preservative used on fishing gear (Newfoundland).

tarako = cod roe as served in a sushi restaurant.

tarama = fish roe (often *Cyprinus carpio*) mixed with salt, bread crumbs, white cheese, olive oil and lemon juice in Greece and Turkey to make taramasalata, eaten as a dip.

tarantello = belly strips of bluefin tuna cooked in brine and packed with olive oil in barrels or cans (Italy), cf. ventresca from albacore.

target = a long thin shred or slice of dried skate (Scottish dialect).

target board = a board which is placed behind a rod tip to shield it from the wind and to more easily spot movement of the tip when a fish bites.

target catch = the species, stock and size sought by a fishery. See also total catch.

target fish = a fish introduced into an aquarium to distract an aggressive breeding pair, venting their aggression so that spawning is successful.

target fishing = fishing for the primary purpose of catching a particular species or group of species.

target fishing capacity = the maximum amount of fish over a period of time (year, season) that can be produced by a fishing fleet if fully utilized while satisfying fishery management objectives designed to ensure sustainable fisheries.  $YT = Y(ET, S)$  in which  $YT$  is target yield or catch;  $ET$  is target effort generated by a fully-utilized fleet; and  $S$  is stock size (biomass). The fishing fleet is meant to be the stock of inputs, i.e. physical capital and human capital. The term fully-utilized is used in a precautionary context in that they assume that capacity utilization is 100%. The maximum catch that capital stocks could remove can be determined by observing them during a period with few restrictions.

target population = a population of fish about which information is desired, e.g. in sport fisheries.

target reference point = a state of a fishery and/or a resource which is considered desirable. Management maintains the fishery system at this level.

target species = the species sought by a fishery. There may be primary as well as secondary target species.

targeted catch = the object of a targeted fishery.

targeted fishery = a harvest strategy designed to catch a specific groups or species of fish.

tarn = a small mountain lake, often occupying a cirque or corrie (Viking). Also called corrie loch.

tarpon nursery = shallow, mostly stagnant pools free of fishes but favoured by young tarpon (Megalopidae).

tassel = strings of equal length at the end of a cord; used to describe the fins of *Latimeria chalumnae*.

tatami-iwashi = larval sardines or anchovies dried in a square frame, giving a product resembling a sheet of paper (Japan).

tategoi = juvenile ornamental carp or koi (q.v.) whose true adult pattern has yet to develop. This pattern can be difficult to spot and fish are often priced to reflect their future value.

taties-and-point = a dish of potatoes with a small piece of fish or meat, so small as to be merely pointed at.

tattie cruse = a potato scooped out, stuffed with fish liver and oatmeal, and roasted (Shetland Isles dialect).

tattooing = a means of marking fish for identification and mark-recovery studies by pricking the skin with a dye.

taum = a fishing line, especially one of horse-hair.

tautogenotype = 1) the single species included in a monotypical genus at the time of publication. See also monogenotype.

tautogenotype = 2) an unofficial term in nomenclature for a type by original fixation.

tautology = unnecessary repetition of a word or statement.

tautonym = one and the same name applied to both a genus and to an included species.

tautonomy = state of having the species or subspecies name identical to the generic name of the genus in which it is placed. Absolute tautonomy is the identical spelling of a generic or subgeneric name and the specific or subspecific name of one of its originally included nominal species or subspecies. Linnaean tautonomy is the identical spelling of a new generic or subgeneric name established before 1931 and a pre-1758 name cited as a synonym of only one of the species or subspecies originally included in that genus. Virtual tautonomy is the nearly identical spelling, or the same origin or meaning, of a generic or subgeneric name and the specific or subspecific name in a binomen or trinomen (not a term regulated by the International Code of Zoological Nomenclature).

tautotype = the primary type of the type species of a genus established by virtue of tautonomy.

taxa = plural of taxon.

-taxis (suffix) = arrangement of, directed response of a mobile organism.

taxidermy = the preparation of the skin of a fish (or other animals) in a life-like manner. The skin is stuffed and mounted, glass eyes used to replace the originals, and the skin may be painted and varnished.

taxis = a directed response or orientation of a motile organism towards (positive taxis) or away (negative taxis) from a stimulus.

taxocene = a taxonomically related set of species within a community; may be used for fishes. See ichthyocene.

taxon (plural taxa) = any taxonomic unit (named or not) or category such as a family, genus, or species. It includes all taxa of lower rank and all individual organisms. A nominal taxon is the taxon, as objectively defined by its type, to which any given name whether valid or invalid applies. Not necessarily monophyletic. A subordinate taxon is a taxon at a lower rank than the taxon of the same coordinate group with which it is compared. A taxonomic taxon, e.g. family, species, is a taxon including whatever nominal taxa and individuals a scientist at any time considers it to contain in his/her study. A zoological taxon is a natural taxon of animals which may or may not have had a name applied to it. An infrasubspecific taxon is one at a lower rank than that of subspecies (not regulated by the International Code of Zoological Nomenclature).

taxon label = a phrase applied to an unpublished taxon concept for reference purposes in a text, to a specimen or to a locality. This is a unique and stable combination of letters and numbers such that it cannot be used as a taxon name.

*taxon novum* = a new taxon, sometimes used when a name in particular rank is derived from a pre-existing generic name for the first time. Abbreviate as tax. n. or tax. nov.

*taxon vagum* = a name used in an uncertain rank. Abbreviated as tax. vag.

taxonomic authority = the author credited with the first description of a species or other taxon.

taxonomic category = referring to the rank of a taxon in a hierarchical classification.

taxonomic distance = a measure of dissimilarity between or among taxa.

taxonomic file = an arrangement of a specimen database by taxonomic category, e.g. species, families.

taxonomic group = any taxon, including all subordinate taxa and their individuals.

taxonomic hierarchy = a hierarchical system of taxonomic categories arranged in an ascending series of ranks.

taxonomic list = a listing of the taxonomic categories and binomens in a taxonomic file.

taxonomic name = the scientific name, nomenclaturally, the word or words that constitute the scientific designation of a taxon.

taxonomic position = rank; the position of a taxon in a hierarchy of classification.

taxonomic purpose = a statement of the taxonomic purpose of the designation of a lectotype; required by the International Code of Zoological Nomenclature to be valid (after 1999).

taxonomic rank = rank (the position of a taxon in a hierarchy of classification).

taxonomic species = Linnaean species (a broad concept of a species often comprising many varieties).

taxonomic synonym = synonym (each of two or more names with different spelling applied to one and the same taxon. The junior synonym is that with the later, the senior synonym is that with the earlier, publication date. Objective synonyms are the two or more synonyms used on the same type. Subjective synonyms are the two or more synonyms based on different types, but which are regarded as referring to the same taxon by those zoologists who hold them to be synonyms).

taxonomic system = a hierarchy of classification.

taxonomic taxon = taxon.

taxonomic unit = the group into which a number of similar individuals may be classified; a taxon.

taxonomy = the study and practice of naming and classifying organisms.

TDS = total dissolved solids, a measure of water quality (the total residue remaining after evaporation of a water sample filtered to remove suspended matter larger than 1.0 mm;

inorganic salts (principally calcium, magnesium, potassium, sodium, bicarbonates, chlorides and sulfates) and small amounts of organic matter that are dissolved in water, not suspended like wood pulp particles).

tea cup fishing = a Japanese method for catching gobies and flounders using porcelain teacups, 20-25 cm across. The cups are stuck at an angle in the mud, providing shelter for fish, which are then caught by hand. The location of the cups is marked by an emergent plant.

tea fish = 1) capelin (*Mallotus villosus*), so-called in Newfoundland because they were supposed to make you sleepy after eating them and so were eaten at the evening meal.

tea fish = 2) salt fish or salt cod (Somerset dialect).

tea seed cake = a fish poison derived from the residue after oil extraction from the seeds of the tree *Camellia oleifera* or *Camellia sinensis* (Theaceae). The active ingredient contains 10-15% saponin. Used in Asia.

teaching collection = a collection of preserved specimens for use in classes. These have fewer restrictions on their use and handling than specimens in research collections, may not be catalogued or accessioned material, and may even be discarded when damaged and no longer of use.

teardrop = a dark mark below the eye in fishes in the shape of a drop.

technical creep = technological creep.

technical interaction = technological interaction.

technological creep = the continual increase in fishing power through scientific innovation, e.g. stronger twine for netting, fish location gear, etc.

technological interaction = an interaction between fisheries resulting from the impact of one fishery using a particular technology on another fishery, usually using a different technology but exploiting the same resources as target or bycatch. This is a major source of failure in TACs and quota management strategies for multispecies and multigear fisheries, e.g. the optimum minimum mesh size in a cod fishery is too large for optimum mesh selection of whiting which are a more slender and smaller species. Thus, too many large, marketable whiting could escape.

tectal = of or pertaining to the roof of a structure, e.g. the top of the head or brain.

tectospondylous = a type of vertebral centra (and arches) with several concentric ossifications instead of just one, extending to the chordacentrum, arcocentrum and autocentrum. Found in skates and rays.

TED = abbreviation for turtle excluder device (any device used to exclude turtles from nets where they may drown; a grid of bars fitted to the mouth of the net allows fish and shrimps to enter but deflects the larger turtles).

tee = an area on the stage (q.v.) head where splitting of cod took place (Newfoundland).

teesit = 1) the line first shot from a fishing boat (Scottish dialect).

teesit = 2) the man whose line is first shot from a fishing boat (Scottish dialect).

teind fish = a tithe levied on a fisherman (Scottish dialect). See also boat teind and fish teind.

teind skate = a skate paid as a tithe (Scottish dialect).

tekka = tuna served in a roll as in a sushi restaurant.

tela choroidea = the roof of the posterior fourth chamber of the medulla oblongata in the brain.

tele- (prefix) = beyond.

telencephalon = the anterior and dorsal forebrain, formed from a division of the prosencephalon. Includes the olfactory bulb. Details of the brain structure of a fish (*Danio rerio*) may be found in Wullimann *et al.* (1996). See also brain.

teleotemporal = posttemporal (the superficial dermal bone connecting the pectoral girdle with the epiotic of the skull. Traversed by the posttemporal lateral line canal).

telephoning = monkeyfishing (using a home-made device to send a strong electrical current through the water, stunning fish which float to the surface and can be dip-netted. Illegal).

teleplanic = used for pelagic larvae that have a protracted planktonic existence, and therefore a capacity for wide dispersal.

telescopic eye = an elongate, cylindrical eye that protrudes forward or upward within an envelope of skin.

teletype = a joke name in nomenclature for a type description which reads like a stock exchange report and has about as much use.

tell-tale shot = setting shot (a split shot used on float rigs. It is attached 15-20 cm away from the hook when that stretch of line is lying on the bottom. When a fish takes the bait, it lifts the shot off the bottom and the extra weight is transferred to the float which sinks to indicate the bite).

telmatophilous = thriving in swamps and marshes.

telmicolous = living in freshwater marshes.

telolecithal = eggs having a large portion of yolk at one end, e.g. Myxini, Elasmobranchii, Holocephali, and many Teleostei.

temaki-zushi = hand rolled cones of sushi rice, fish and vegetables wrapped in seaweed.

temperate region = ocean waters between the 13 and 20°C winter isotherms.

temperate waters = waters in the region of higher latitudes than tropical latitudes, between the Tropic of Cancer and the Arctic Circle in the northern hemisphere, and the Tropic of Capricorn and the Antarctic Circle in the southern hemisphere.

temperature coefficient = the quantitative increase or decrease in fish metabolic rate for each ten degree change in body or environmental temperature. Abbreviated as  $Q_{10}$ .

temperature shock = physiological stress to a fish caused by a sudden or rapid temperature change. A change greater than three degrees an hour in some definitions.

tempering = softening of frozen fish without thawing by raising the temperature to -10 to -15°C, such that blocks of fish can be cut into fish fingers or other commercial products.

Temple of the Heavenly Fish = the Beomeosa Temple on the slopes of Geumjeongsan Mountain in Pusan, South Korea. Legend has it that an enchanted, golden fish descended from heaven and lives in a golden well at the top of the mountain.

Temple of the Nirvana Fish = Temple of the Heavenly Fish.

temporal = pertaining to the region just behind the eyes.

temporal closure = a temporary or seasonal ban on fishing.

temporal pore canal = the head canal over the temporal region.

temporary parasite = a parasite which visits the host at intervals.

temporary pool = a small, ephemeral water body, perhaps containing water for only a few months in each year. Inhabited by annual killifishes (Cyprinodontidae) that have abbreviated life spans and lay eggs resistant to drought.

tenaculum = a supplemental clasper in Holocephali, one in front of the pelvic fin (prepelvic tenaculum) and one on the forehead (cephalic tenaculum).

tender = a boat that supplies fishing vessels with supplies, and buys unprocessed fish from them for transport to shore or a mothership.

tenderloin = deep trunk muscles of fish extending from head to tail.

tenderometer = a machine that assesses the tenderness of fish by shearing flesh with metal plates and recording the resistance.

tendines = plural of tendon.

tendon (plural tendines) = a cord or band of white, fibrous connective tissue connecting a muscle to a bone and serving to transmit muscular force. Tendines is the plural in Latin but English usage has tendons.

tendril = a slender, curling barbel or other structure.

tendrilform = having the form or shape of a tendril.

tensor tripodis = a small muscle in certain catfishes with drumming muscles on the gas bladder, e.g. Pimelodidae. The tensor tripodis runs from the posterior surface of the neurocranium to the dorsal surface of the gas bladder near the tripus and is thought to reduce or stop vibrations of the tripus and so sound conduction to the inner ear. The fish can drum without deafening itself.

tentacle = 1) a short fleshy appendage, perhaps better termed cirrus.

tentacle = 2) the illicium, *q.v.*, of an anglerfish, incorrectly.

tentaculum = a fibrous structure supporting the eye in Teleostomi corresponding to the optic pedicel, *q.v.*, of Elasmobranchii.

tenter = a bar of wood fitted with hooks on which fish are hung to dry, hence tenter hooks (Scottish dialect).

tenter hooks = see tenter and tentering.

tentering = hanging fish by tenter hooks on tenter sticks. Tenter sticks are rods that are square in cross-section and carry hooks on each face.

tenuis stage = larval stage of Carapidae following the vexillifer stage, characterized by lack of the vexillum, thin body, the immense length of the cylindrical body and the relative smallness of the head (about 1/30 of total length of the body). The transparent tenuis larva is first benthic and free-living, then inhabits the cavity of a sea cucumber.

terata = an obsolete term for divergences from the type of a genus; monsters.

teratum (plural terata) = 1) see terata.

teratum = 2) an injury from angling, predator attacks, boat propeller, collisions, etc.

teratological = abnormal, as in a malformed specimen.

teratology = the study of malformations.

teratotype = an unofficial term in nomenclature for a type based on an abnormal specimen or a monstrosity.

terete = round in cross-section and tapering.

terminal = at the end. Said of the mouth when it is at the tip of the body rather than ventral or subterminal, or of embryos near the end of development.

terminal area = a fishery location where a targeted species or stock has separated from other species or stocks it was mixed with. Often a river mouth for migratory stocks and species.

terminal F = in a stock assessment, e.g. a virtual population analysis, refers to fishing mortality values in the last year for which data are available and on the oldest age class in each season.

terminal fisheries = fisheries near freshwater, usually the mouth of rivers or bays or near a hatchery release site, where the targeted species is returning to spawn.

terminal lake = a lake with no outlet.

terminal male = supermale, the dominant male, e.g. seen in members of the Labridae and Scaridae and characterised by a distinctive colour pattern. Also called terminal phase male.

terminal phase male = terminal male.

terminal tackle = the equipment at the end of a fishing line, such as hooks, lures, floats, bobbers, weights, swivels, sinkers, snaps, beads, leaders, etc.

terminal vertebrae = the last complete centrum of the vertebral column; not homologous across taxa because of varying fusions of preural and ural centra and so of little utility. Also called ultimate vertebra.

termination = the end or ending of a name, determined by the gender of the noun to which it is attached. In nomenclature, scientific names have various endings added to the stem of Greek and Latin words.

terminus = the end, e.g. of an anatomical structure; the tip.

ternary name = trinomen.

terrace = a relatively-flat, horizontal, or gently inclined surface, sometimes long and narrow, which is bounded by a steeper ascending slope on one side and by a steeper descending slope on the opposite side.

terrestrial = flies tied to imitate land insects that fall on the water surface and are fed on by fishes, e.g. ants, beetles, grasshoppers.

terrine = a glazed, earthenware dish with vertical sides and a tight lid, often oval or oblong in shape. Food prepared in a terrine may be called by this term, and is usually finely chopped or ground, e.g. sturgeon terrine.

territorial = relating to the defence of an area in fish behaviour.

territorial waters = the area beyond the tidal base line of the open coasts of a country over which that country exercises full control except for innocent passage of foreign vessels. Set at a maximum of 12 nautical miles in breadth by the 1982 Law of the Sea Treaty. The United States claims territorial waters three nautical miles in width.

territory = area over which an animal establishes jurisdiction; the area is defended and no other individuals of the same species (and often of other species) are allowed inside.

Tertiary = a geological period of the Cenozoic Era ca. 65-16 million years ago comprising the Palaeocene, Eocene, Oligocene, Miocene and Pliocene. Abbreviated as T.

tessellated = marked with little squares like a mosaic; checkered.

tessera (plural tesserae)= the nonectodermal prismatic calcification forming a major portion of the mineralized tissue in sharks. A tessera consists of one or more irregular layers of calcifications surrounding a radiating cluster of cells (easily seen on the prepared surface of a lower jaw).

tesserae = plural of tessera.

test curve = time and weight needed to make a rod tip bend 90 degrees from the rod butt. A fast test curve means the rod bends quickly and easily and the rod is very soft as in match rods while a slow test curve is found in stiffer rods used to fight big fish. A match rod may have a three-quarter pound test curve while a carp rod has a 2.5 lb test curve.

test fish = a fish used for research purposes.

test fishing = fishing that attempts to obtain data about commercial stocks.

test trawl = a small trawl, e.g. in Louisiana not more than 16 feet along the corkline or 20 feet along the headline.

teste = according to, on the evidence of. Abbreviated as t.

testes = plural of testis.

testicular gland = a glandular tissue situated adjacent to the testis of Blenniidae and several species of Gobiidae. In *Blennius pavo* the spermatozoa cross the gland to reach the vas deferens and thus contact the gland cells. Structure and histochemistry indicate the gland has exocrine and endocrine functions. In *Gobius niger* the vas deferens is located between the testis and the testicular gland. Structure and histochemistry indicate its gland is exclusively endocrine.

testis (plural testes) = the male reproductive organ, producing sperm. The testes are found posterior to the stomach, below the swimbladder and dorsal to the intestine.

tetra- (prefix) = four, fourfold.

TetraMin = the trade name for the first major flake (*q.v.*) food used to feed aquarium fishes. Composed of four (tetra) different types of dry flakes with vitamins (min), this convenient form of fish food greatly facilitated the keeping of tropical fish in aquaria.

tetraodoic acid = a name of a product resulting from tetrodotoxin.

tetraodon poisoning = see tetrodotoxication.

tetraodontoxin = a substitute name conforming to the correct generic name *Tetraodon*. But tetraodontoxin has never found acceptance and has been discarded.

tetraploid = having a chromosome complement of 4n, twice the usual number of most organisms. Not uncommon in fishes.

tetrodonic acid = a term first proposed for an acid fraction of tetrodotoxin, later found not to exist. Later resurrected to apply to a tetrodotoxin with the empirical form C11 H19 O9 N3, and having the properties of an amino acid.

tetrodonin = first applied to one of two toxic substances isolated from puffer poison; then applied to a fraction later shown to be an impurity. Proposed empirical formula C11 H11 N9 O2.

tetrodopentose = a term proposed to designate an impurity believed to be a pentose, separated from a puffer poison; later identified as a mixture of a mesoinositol and scillitol.

tronin = a term used to designate a nitrogenous base obtained from crude puffer poison. Thought to have the empirical formula C11 H11 N9 O2. Never clinically identified.

tetrodotoxication = poisoning caused by eating tetrodotoxic fishes. Symptoms usually develop 10-45 minutes after ingestion and include stiffness of lips and tongue, tingling of the extremities which changes to numbness, hypersalivation, sweating, extreme weakness, precordial pain, headache, subnormal temperature, decreased blood pressure and a rapid weak pulse. Nausea, vomiting, diarrhoea, and epigastric pain may appear. Respiratory distress, blueness of the skin, and extensive muscular paralysis ensue. The fatality rate is about 59%, death usually taking place between 6 and 24 hours. There is no known antidote and treatment is purely symptomatic. Emetics, laxatives and enemas have been found useful. Artificial respiration is the most important therapeutic measure and should be applied along with pentylenetetrazol.

tetrodotoxic fishes = those fishes causing tetraodon or puffer poisoning, certain members of the tetraodontiform families Tetraodontidae, Diodontidae, Canthigasteridae, and possibly the Molidae and Triodontidae. The toxicity of a species is often subject to variation from specimen to specimen and from one locality to another, some being harmless, others highly toxic. They are generally most toxic immediately preceding and during the height of gonadal activity. Female puffers are considerably more toxic than the male. The skin, liver, ovaries and intestines are the most toxic parts; the musculature is usually safer to eat than other parts but may be at times toxic. Immunity is not gained by repeated ingestion. The poison is not inactivated by cooking.

tetrodotoxin = the poison found in tetrodotoxic fishes; also called spheroidine, fugu toxin, or puffer poison (anhydrotetrodotoxin 4-epitetrodotoxin or tetrodonic acid). The empirical molecular formula is (C11 H17 N3 O8 HBr), a complex molecule. It is among the most toxic substances known among the non-proteins. It is a sodium channel blocker, preventing transmission of pain signals and is being examined as a non-addictive pain suppressor, 3000 times more powerful than morphine.

teuk trey = a Cambodian fish sauce similar to the Vietnamese nuoc-mam, *q.v.*, but with the addition of ground peanuts.

Texas rig = a method of securing a hook to a soft bait so it does not become entangled in weeds. A slip sinker is threaded onto the line and a hook tied to the line end. The hook is inserted into the head of a worm, for example, and brought through until only the eye is in the worm. The hook is then rotated and the point embedded slightly into the worm without coming out on the opposite side.

texture = a commercial measure of firmness in fish to be marketed. Firm fish show significant resistance when pressed with the index finger or hand, slightly soft fish show some resistance and soft fish provide little resistance.

Thai fish sauce = a sauce made from salted and fermented fish. Also called fish gravy.

thalassic = pertaining to the sea.

thalasso- (prefix) = pertaining to marine or brackish waters.

thalassoid = having marine affinities.

thalassophilous = thriving in the sea.

thalassophobia = a fear of the sea or the ocean.

thalassoplankton = marine plankton.

thalweg = 1) the river centre, the part with the greatest flow and depth. Used to define international riverine borders (from the German for valley (thal) and way (weg)).

thalweg = 2) the lowest thread along the axial part of a valley or stream channel.

thalweg = 3) a subsurface, ground-water stream percolating beneath and in the general direction of a surface stream course or valley.

thalweg profile = a longitudinal profile of a riverbed elevation measured along the deepest portion of the river. Gives useful information on fish habitat.

thanatocoenosis = an assemblage of organisms or their parts brought together after their deaths, e.g. fish bones by flowing water. See also death assemblage.

thaw drip = the liquid exuding from, and lost to the fish, during thawing.

The Trout = see Trout Quintet. The popular "Die Forelle" was written in 1817 by Franz Schubert for solo voice and piano.

theea = a Scottish term for a leister (a pronged and barbed fish spear, appearing in various cultures world-wide. In England, used for striking salmon by torchlight and now an illegal weapon. See also sun-leistering).

thecodont teeth = teeth rooted in a cavity, a rare condition in fishes, e.g. in Pristiophoridae and Pristidae.

thelytokous = reproduction that is exclusively female with no male contribution to the young.

there's as good fish in the sea as ever came out of it = a late sixteenth century English saying meaning another chance will come along.

therm- (prefix) = heat.

thermal = 1) relating to heat.

thermal = 2) a circulating column of warm air.

thermal guild = a group of unrelated fishes with similar temperature preferences, e.g. coldwater 4-15°C, coolwater 10-21°C and warmwater 15-27°C (note sources differ for temperature ranges in these categories presumably dependent on local temperature regimes).

thermal lag = the delayed heating and cooling of large bodies of water, such as the ocean and lakes, in relation to land conditions.

thermal layer = thermocline.

thermal refugium = a place that serves as a shelter from adverse temperatures, e.g. in a stream.

thermal mark = a ring in an otolith caused by a certain temperature regime during early incubation. Judicious use of temperature regimes and timing of them can cause a mark pattern specific to a hatchery and brood stock. The pattern will vary in the number and spacing of rings. The fish has to be killed later and the otolith extracted to retrieve the pattern and identify the fish.

thermal refugee = fishes found in cool springs, avoiding warmer conditions, e.g. Gulf of Mexico sturgeons found in rivers near artesian springs.

thermal spring = a spring with water 9.4°C above mean air temperature.

thermal stratification = temperature layers in a lake; the upper layer or epilimnion has a mostly uniform temperature, the next layer or thermocline shows a marked drop in temperature over a short distance, and the lowest layer or hypolimnion has a uniform temperature.

thermo- (prefix) = heat.

thermocline = the zone of rapidly changing temperature between the warm upper layer (epilimnion) and the lower cold layer (hypolimnion). Characterized by a temperature change of 1°C or more per metre.

thermohaline = pertaining to both temperature and salinity.

thermopegic = pertaining to hot water springs.

thermophilic = warm-loving. Opposite of psychrophilic and thermophobic.

thermophobic = intolerant of high temperatures.

thermotaxis = movement towards or away from heat.

thiaminase = an enzyme that destroys the vitamin thiamine. Found in alewives (*Alosa pseudoharengus*) that invaded Lake Ontario and were eaten by adult Atlantic salmon (*Salmo salar*) - hatched young died of thiamine deficiency.

thick = 1) numerous, in reference to fish and other animals.

thick = 2) a concentration of plankton in the upper layers of water obscuring a view of the bottom and favourable for fishing (Newfoundland).

thief net = a net suspended from the side of a herring fishing boat to catch any fish dropping from the main net.

thigmotaxis = orientation by tactile sense. Fish are often negatively thigmotactic, avoiding touching each other or solid objects, although many are positively thigmotactic, hiding under rocks or among plants for example.

thigmotropic = attracted to a solid body, e.g. said of fish favouring rocky habitats.

thin = 1) to pick out the bones from cooked fish. See also tin.

thin = 2) thinning.

thinning = in aquaculture, removing part of a stock from a pond to ensure better growth of the remainder.

thiomersal = sodium merthiolate (a disinfectant for living fish eggs. The sodium salt of ((o-Carboxyphenyl)thio)ethylmercury).

thirds = grade of dried and salted cod in Newfoundland, ranking in quality below merchantable and Madeira.

thirty second rule = after 30 seconds out of water trout have little chance of survival when released.

thohar = a fish poison made from the sap of *Euphorbia rogleana*, a cactus. Used in northern India.

tholichthys stage = postlarval stage of Chaetodontidae and Scatophagidae characterised by large bony plates extending onto the body from the head which is itself encased in bony armour and often by silvery colour. The tholichthys plates are lost during the juvenile stage.

thoracic = in the region of the thorax, anterior to the abdomen. Said of pelvic fins when located under the pectoral fin.

thoracic photophore = one of a line of light organs along the breast on either side of the midventral line in front of the pelvic fins in Myctophidae. Abbreviated PO.

thoracic vertebra = vertebrae with only a fused neural spine, e.g. in *Archoplites interruptus* (Centrarchidae)

thorn = a large spine or denticle on skates and rays.

thornlet = a small thorn.

thorow = killing a fish by choking and detaching the hook at the same time by inserting a stick in the throat and twirling it around (Scottish dialect).

thrash = a bundle of fish on a string made of plaited rushes (Scottish dialect).

thrasher = a length of chain, the noise of which drives fish into a net when shaken. See also dasher, douser and trouner.

thread cell = a cell in the skin of Myxini which discharge coiled threads mixed with mucus.

thread-line fishing = angling, q.v.

threatened = a general term used to cover all taxa whose survival is uncertain.

three boat lift net = a coastal Japanese net measuring 60 by 70 m laid on or close to the bottom in a moderate current and lifted by the three boast when fish swim over the net. Used to catch sardines. See also two boat, four boat and eight boat lift nets.

three leg = an uncompleted mesh of a fish net, having three corner knots and one loose strand of twine (Newfoundland).

three-eyed fish = 1) a rare developmental anomaly seen in some embryos. Adult fish with three eyes are usually fakes, see three-eyed haddock.

three-eyed fish = 2) Blinky, a three-eyed fish making sporadic appearances on the The Simpsons television show; formed by mutation through radioactive wastes from a nuclear power plant and a sad commentary on how the three-eyed fish has changed from a simple joke on gullible tourists (see below).

three-eyed haddock = a normal haddock (*Melanogrammus aeglefinus*) with an eye from another haddock carefully implanted above the gill opening on the side of the head. In the most extreme cases, this is done on a living fish which shows some healing over several months making this fake even more realistic.

three-mile limit = the limit of territorial waters claimed by many states although much wider limits are claimed for fisheries.

threepenny vomit = a serving of fish and chips in a restaurant (slang).

thresh = thrash.

threshold reference point = indicates that the state of a fishery and/or a resource is approaching a target reference point (TRP) or a limit reference point (LRP), and that a certain type of action (usually agreed beforehand) needs to be taken. Fairly similar to a LRP in their utility, the ThRp specific purpose is to provide an early warning, reducing further the risk the the LRP or TRP are inadvertently passed due to uncertainty in the available information or inherent inertia of the management and industry systems. Abbreviated as ThRP.

thrimble = to catch fish by clutching them in the hand.

throat = 1) the anterior ventral surface under the head.

throat = 2) the distance from the tip of the point to the bottom of the hook bend in a fishing hook, q.v.

throat = 3) to cut the throat of a fish and slit the belly open from gills to vent.

throat line = a longline used for catching cod. Also called thrott line.

throat teeth = pharyngeal teeth (teeth on the pharyngeal bones. May be placed in a dorsal and ventral pair, as in most teleost fishes, or in laterally opposing pairs, one set on each side, as in Cyprinidae and Catostomidae. The upper pharyngeal teeth are located on a dentigerous plate on the fourth pharyngobranchials and the lower pharyngeal teeth on the dentigerous plate on the fifth ceratobranchials. The pharyngeal teeth of minnows and suckers are processes on the dentigerous plate of the fifth ceratobranchials and are thus homologous to the lower pharyngeal teeth of other fishes; these oppose a prominent horny pad which rests on a projection from the basioccipital).

throater = a fish processor who slit open the throat and belly (Canada).

thrott line = throat line.

through-action rod = a fishing rod that bends throughout its length in a progressive fashion.

throw = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

throw a sprat to catch a herring (or whale) = to forego an advantage in hope of greater profit.

throw away one's grapnel = lowering an anchor with float attached to indicate occupancy of a particular fishing ground (Newfoundland). See also douse the killick.

throw back = bass (*Micropterus* spp., Centrarchidae) too short to meet tournament standards; usually less than 14 inches (ca. 36 cm). Also called baby, dink, nubbin, pop corn, and slick.

throw net = castnet (a method of catching fish in shallow waters by throwing a circular net over them; the net opens in the air to a diameter of about 2 metres and sinks rapidly because of

weights attached to its margin. The rim of the net has a draw rope that enables it to be closed. Also called trow net).

throw out = to place split and salted cod on a flake (*q.v.*), and turn it at intervals to dry by exposure to sun and wind (Newfoundland).

ThRP = threshold reference point (indicates that the state of a fishery and/or a resource is approaching a target reference point (TRP) or a limit reference point (LRP), and that a certain type of action (usually agreed beforehand) needs to be taken. Fairly similar to a LRP in their utility, the ThRp specific purpose is to provide an early warning, reducing further the risk the the LRP or TRP are inadvertently passed due to uncertainty in the available information or inherent inertia of the management and industry systems).

thumb knot = a knot used by anglers for attaching hooks and rings to heavy line. Various websites have animated steps showing how to tie this knot.

thunniform = a form of swimming in fish involving very little body bending, thrust being generated by the tail powered by the myotome. Named for *Thunnus*. See also anguilliform, carangiform, labriform, ostraciform.

thymol = a volatile, crystalline chemical with anti-fungal properties often added to cleared and stained preparations of fish skeletons stored in glycerol.

thymus = a series of glands along the dorsal angles of the gill pouches (from which they originate). Supposedly an endocrine gland.

thyroid gland = the endocrine glands controlling growth located around the ventral aorta in the branchial region, around the eye, hepatic veins and anterior kidney in fishes. Because of this wide distribution, may be mistaken for tumours.

tibbet = tippet.

tickle = a narrow and dangerous strait (Newfoundland).

tickler chain = a heavy chain across the mouth of a trawl in front of the groundrope to disturb flatfish, causing them to swim up off the sea floor and be caught in the trawl.

tickling = a technique of catching fish by hand. The fish, often hiding under a stream bank, must be approached stealthily, gently rubbed or "tickled" on its belly until the hand can be advanced near enough to the head to ensure a firm grasp in the gill openings so it can be pulled from the water. Akin to hogging and noodling, *q.v.*, but perhaps more refined.

tidal = the adjective for tide.

tidal bore = bore (1) a rapid tidal rise in a river that forms an advancing wall of water. Also called eagre).

tidal circulation = the movement of fresh water and sea water as they are mixed by ocean tides.

tidal current = the alternating horizontal movement of water associated with the rise and fall of the tide. Often called the tide.

tidal datum = reference plane (the plane to which sounding and tidal data are referred).

tidal day = lunar day (in describing tides, the time of rotation of the Earth with respect to the moon, or the interval between two successive upper transits of the moon over the meridian of a place. The mean lunar day is approximately 24.84 solar hours in length).

tidal delta = a delta formed at both sides of a tidal inlet.

tidal fishery = the fishery made when a tide recedes, leaving fish in pools. This natural event may be aided by digging pits, diversion channels, dams, etc. See also flood fishery.

tidal flat = a muddy area usually bordering an estuary, exposed by tides.

tidal gut = 1) a narrow channel.

tidal gut = 2) an elongated rock pool open to the sea at one end.

tidal inlet = a waterway from the open ocean into a lagoon.

tidal marsh = a low, flat area comprising bushes and grasses interspersed with channels and under tidal influence.

tidal period = the time it takes for one tidal cycle.

tidal pool = a pool of water remaining on a beach or reef after the tide recedes.

tidal prism = 1) the total amount of water that flows into or out of a harbour with the tide.

tidal prism = 2) the volume of water present between mean low and mean high tide.

tidal range = the difference in height between consecutive high and low (or higher high and lower low) waters.

tidal rise = the height of tide as referred to the datum of a chart.

tidal rotary current = a tidal current that flows continually with the direction of flow changing all around the compass during the tidal period. Generally found offshore where there are no barriers. The cause is the earth's rotation and so is clockwise in the northern hemisphere and anti-clockwise in the southern hemisphere.

tidal stand = an interval at high or low water where there is no observable change in the height of the tide.

tidal stream = tidal current (Britain).

tidal wave = 1) any wave produced by tides and tidal currents.

tidal wave = 2) a storm surge or tsunami, highly destructive. A non-technical term.

tidal wetland = a coastal area that is inundated by tides.

tidal zone = the area along the coast influenced by the rise and fall of tides.

tidbit = 1) bite (a small piece of fish breaded or coated with batter, weighing less than 1 oz. Of various shapes such as round, square, or irregular. May be cut from regular blocks or blocks of minced fish. Generally sold by count, 25-35 per lb. Also called cubes, nuggets, and petites).

tidbit = gaffel bitar (semi-preserved fat herring, gilled or headless, with 10-12% salt and sometimes benzoic acid added. The product is ripened in barrels at moderate temperature, then filleted, skinned and cut into 'tidbit' pieces, packed with spiced brine, and also with vinegar or with sauces in cans or glass jars. Also called herring tidbits or fork tidbits).

tiddler = a small fish.

tide = 1) the periodic rise and fall of ocean water produced by gravitational effects of the moon and sun on the earth. The horizontal movement of water caused by this vertical movement is often called the tide, but correctly is the tidal current.

tide = 2) the quantity of fish taken ashore at one time (British dialect).

tide = 3) a net which traps fish by the falling tide (Scottish dialect). See also tide net.

tide = 4) a good catch of fish.

tide gage = a device for measuring the rise and fall, and the current height, of the tide.

tide level = the height of the tide above a specified level.

tide net = a fixed net filled by the tide and stranding fish as the tide ebbs.

tide pool = an area in the littoral zone that retains sea water at a low tide because of a depression or arrangement of rocky substrate; a year-round habitat for certain fishes and a spawning site for others.

tide race = a very rapid tidal current in a narrow channel.

tide staff = a fixed gage comprised of a vertical, graduated staff from which the tide height can be read.

tide station = the place where tidal observations are made.

tide stick = a wooden device placed on side of a dory and used to guide the hauling in of a trawl line (Newfoundland).

tide tables = published tables giving daily predictions of the times and heights of tides.

tideland = the zone between the mean high water and mean low water lines, identical with the intertidal zone (technical definition) when the type of tide is semidiurnal or diurnal.

tidewater = 1) water affected by tides.

tidewater = 2) an area of water affected by tides and the surrounding land.

tidewater = 3) areas always covered by tidal waters, cf. tideland.

tideway = a channel through which a tidal current flows.

tidy = a Newfoundland adjective for a tidal area subject to the turbulence of currents and the ebb and flow of the tide; in reference to the fishery.

tie = tae.

tie into = hooking a big fish.

tie-tail = a herring with the gill region broken and so cannot be hung by their head therefore are tied on to the spits by their tails.

tierce = a wooden container of designated size for the export of fish; was an old measure of 42 gallons (Newfoundland).

tiger = a hybrid of brown trout (*Salmo trutta*) and male brook trout (*Salvelinus fontinalis*).

tight lines = angler's salutation.

tight pack = alewives (*Alosa pseudoharengus*) gutted and cured in strong brine and packed in barrels with dry salt. Also called Virginia cure, hard cure and pickled alewives (Canada).

tight work = a waterproof construction for barrels used in shipping pickled fish.

tight-action plug = a lure with short, rapid side-to-side movements.

tilapia = both a genus of cichlid fishes and a general term for several of the larger species used in aquaculture.

Tilly bone = an unusually thickened bone which may occur in the axial or cranial skeleton of some fishes, e.g. thickenings of haemal and neural spines, postcleithra and anterior cranium in *Lagocephalus*. Named for Tilly Edinger of Harvard (1897-1967) who studied these structures. Being larger and denser than usual bones, they are often found concentrated on beaches and in middens and, when rounded by wear and wave action, tend to look very unfish-like. Often found in fish in hypersaline environments and may play some part in calcium regulation. Also called hyperostosis, q.v.

tilt = tip-up.

tilt fishing = use of a tip-up.

time closure = a period of time when no fishing is allowed.

timmy noggy = tommy noggin.

timnodonic acid = an omega-3-fatty acid, *q.v.*, found in fish oil; its chemical name is *all-cis*-5,8,11,14,17-icosapentaenoic acid. Said to reduce the risk of heart attacks in humans when ingested at 1800 mg per day. Also called eicosapentaenoic acid or icosa-pentaenoic acid and timnodonic acid.

tin = to pick bones out of boiled fish heads, saving the fleshy parts. See also thin.

tin fish = slang for a torpedo.

tinabal = a fish product similar to bagoong (*q.v.*)(Philippines).

tinapa = herring-like fish, whole or gutted, dipped fresh into boiling brine and then smoked (Philippines).

Tincomarus = a king of the Atrebates of south-central Britain shortly before the Roman invasion. The name is translated as "big fish".

tino (noun) = 1) a skewer or spit for fish when drying (Orkney dialect).

tino (verb) = 2) to spit a fish on a tino (Orkney dialect).

tinsel = metal filaments used in fly tying to provide colour and flash.

tip length = the distance from the snout to the tip of the tail.

tip ring = tiptop.

tip section = the top section of a fly rod, smallest in diameter.

tip the fin = to shake hands (from the slang, fin, for hand).

tip-action rod = a fishing rod that bends at the tip and middle sections.

tip-top = the guide at the end of a fishing rod.

tip-up = a device used in ice fishing. A short rod with the line attached pivots on a short stick sunk into the snow; the end opposite the line attachment tips up when the line is pulled by a fish (and may have a flag). Modern tip-ups are often more complex; some have a light to indicate a bite in the dark, others automatically jig the bait and some have underwater reels. Also called tilt.

Tip-Up Town, USA = Houghton Lake in Michigan where up to 40,000 people can gather for ice fishing, snowmobiling, snow sculpting and fireworks.

tiphic = pertaining to ponds.

tiphicolous = living in ponds.

tiphophilous = thriving in ponds.

Tippecanoe = a town name in Indiana meaning buffalo fish (*Ictiobus*, Catostomidae) in Algonquian.

tippen = tippet (1).

tippet = 1) a length of twisted hair or gut in a fish line (Scottish). Also spelled tippen and tibbet.

tippet = 2) the very end of a tapered leader that attaches to the fly in fly-fishing. It is the same diameter along its length and ranges from 7X (very fine) to 0X (very heavy).

tippet = 3) breast and neck feathers of the golden pheasant used in tying artificial flies.

tippet stone = a circular stone with a hook in the centre used in twisting tippets (1).

tippit = tippet (1).

tiptop = line guide at the tip of a fishing rod. Called tip ring in Britain.

tire reef = fish habitat made from old vehicle tires weighted to keep them in place.

tirmal = a fish poison made from the seeds of the toothache tree, *Xanthoxylum alatum* (Rutaceae) (India).

titling = a small stock fish (Scottish dialect)

titmuck = an Inuit delicacy of fish such as salmon, buried in a hole and left to ripen.

T-net = a coastal or intertidal salmon net in Scotland and England with the trap set across the outer end of a leader of netting thus forming a T shape.

TL = abbreviation for total length.

TMA = abbreviation for trimethylamine; see trimethylamine oxide.

$T_{\max}$  = abbreviation for lifespan (the maximum expected age, on average, for a species, cohort, stock, or a population in the absence of fishing. Smaller than maximum age although may be used in this sense. Abbreviated as  $T_{\max}$  in stock assessment models).

$T_{\min}$  = the minimum time required to rebuild an overfished stock. Usually the minimum time in which a stock will have a 50% chance of rebuilding if no fishing occurs.

to the gills = completely, as full as possible.

to throw a sprat to catch a mackerel = a tradesman selling one article cheaply to attract more custom.

tobiko = the red and crunchy eggs of flying fish used as a food in Japan.

Tobias' fish = Tobit's fish.

Tobit's fish = the Book of Tobit in the Apocrypha tells of Tobit, who was blinded by sparrow dung while sleeping in a courtyard. The archangel Raphael told Tobit's son to catch a huge fish in the Tigris River and apply its gall to Tobit's eyes to cure his blindness. The fish was probably *Barbus esocinus*, a large member of the Cyprinidae.

tod = a small number of dried and salted cod piled on a flake (*q.v.*) (Newfoundland).

toe-biter = fish-killer (an aquatic insect of the family Belostomatidae, e.g. *Lethocerus americanus*, which feeds on small fishes).

tofu-fish = an unusual culinary concoction made by adding live weatherfish (*Misgurnus anguillicaudatus*, Cobitidae) to a pot of tofu and water. The pot is heated and the weatherfish buries itself in the tofu, mistaking it for mud, and is cooked along with the tofu.

toggling harpoon = a harpoon with a detachable head which twists or toggles when plunged into a fish.

tôkan-hin = a fish product dried after removing water by repeated freezing and thawing (Japan).

tol squoll = talis squalis.

tolerance limit = a 24 hour TL<sub>50</sub> is the concentration of a chemical which kills (or effects in other specified ways) 50% of fish in 24 hours.

toll = to draw, allure or entice. Used in older fishing texts to indicate that fish are being attracted in some fashion, e.g. by scattering bait.

tom = a branch line with a hook, attached to a main line. Also called gangen and stangeon.

*tom.* = abbreviation for *tomus*.

*tom. cit.* = *tomus citatus*.

tomcod = 1) *Microgadus tomcod* (Gadidae).

tomcod = 2) a grade or cull of dried and salted cod (*Gadus morhua*).

tomcod = 3) a young cod (*Gadus morhua*).

tommy noggin = a frame of a weighing device on which dried cod are placed (Newfoundland).

tommy nogger = tommy noggin.

*tomus* = volume. Abbreviation *tom.*, *t.*

*tomus citatus* = in the volume cited, used to avoid repeating the full citation. Abbreviation *tom. cit.*

ton = a measure of weight in Britain equal to 1016.05 kg (this is the long ton; the short ton of North America is equal to 907.184 kg).

ton, metric = 1000 kg, 2204.62 lb, 0.984 long ton, 1.102 short ton. Strictly the metric ton should be spelled tonne but often appears in international literature and seafood sales as ton.

ton (short) of water per 24 h = 37.8 L/h or 9.986 gal/h.

toneles = tons (Spanish), sometimes used in old fisheries texts.

tongs = ridged metal tongs with long wooden handles used to pick up slimy, slippery and muscular eels.

tongue = 1) long-handled tongues used for catching fish or for holding slippery or dangerous fish such as moray eels.

tongue = 2) a structure in the mouth of fish sometimes bearing teeth; used to manipulate food.

tongue = 3) a long narrow strip of land projecting into a body of water.

tongue twisters:-

1 = riba ribi grize rep (the fish bites the fish's tail) (Bosnia).

2 = Fisherman Fritze fishes fresh fish, fresh fish does fisherman Fritze fish (Germany).

3 = Fischer Fritze fischt frische Fische; Frische Fische fischt Fischer Fritze (Fisher's errand boy is fishing fresh fish, fresh fish are fished by Fisher's errand boy) (Germany).

4 = Threadbare Fred feeds on fried fresh fish, fish fried fresh, fresh fried fish, fresh fish fried, and fish fresh fried, does threadbare Fred.

5 = I often sit and think and fish and sit and fish and think and sit and fish and think and wish that I could get a cool drink!

6 = Mrs. Smith's Fish Sauce Shop.

7 = Freshly-fried flying fish.

8 = There was a young fisher named Fischer,  
Who fished for a fish in a fissure,  
The fish with a grin,  
Pulled the fisherman in,  
Now they're fishing the fissure for Fischer.

9 = Five fat friars frying flat fish.

10 = Five frantic frogs fled from fifty fierce fishes.

11 = Fran feeds fish fresh fish food.

12 = Finicky feline feasts on fried fresh fish fin.

13 = I wish she were a fish in my dish.

14 = This fish has a thin fin. That fish has a fat fin. This fish is a fish that has a thinner fin than that fish.

15 = She saw a fish on the seashore and I'm sure the fish she saw on the seashore was a saw-fish.

16 = The fishy fish went swishy swish swish,  
As it swam along the shore,  
It had two baby fishes,  
That would fit in two dishes,

And who could ask for more?

tonic immobility = cessation of movement in response to a threat, e.g. sharks will remain motionless for about 15 minutes if flipped over or stroked on the nose (don't try this at home!).

tonnara = madrague (an anchored pound net used for tuna in the Mediterranean Sea).

tonne = metric ton, 1000 kg, 2204.62 pounds (lb), 0.984 long tons, 1.102 short tons. Often spelled ton, confusingly, but most modern tons outside North America will be metric tonnes.

tonno = canned tuna in olive oil, heavily salted.

took = a twitch or pull, as at a fishing line (Scottish dialect).

toot = a line for deep-sea fishing (Scottish dialect).

toot net = an anchored net extending from a beach into the water or to an anchored boat. It is hauled in when a fish strikes the net (Scottish dialect). Also called hang-and-toot net or toot-and-haul net.

toot's-man = the man who gave directions for the hauling of the toot net when he sees the fish enter it (Scottish dialect).

toot-and-haul net = toot net.

tooth file = in sharks, the line of functional and replacement teeth of different ages in a labial-lingual direction. The row is derived from a single germinal area usually at approximately right angles to the jaw cartilage. Same as mis-named tooth row (2). See also diagonal file.

tooth plate = a flattened structure bearing teeth or a type of tooth which is the form of a flattened plate, e.g. in chimaeras and hagfishes.

tooth row = 1) teeth in a mesial-distal line across the jaw in sharks and of the same age; not the same as (2) which strictly is called a file of teeth.

tooth row = 2) in sharks, the line of functional and replacement teeth of different ages. The row is derived from a single germinal area usually at approximately right angles to the jaw cartilage.

tooth series = in sharks, the line of teeth parallel to the jaw axis, comprising several different rows.

toothache tree poison = tirmal (a fish poison made from the seeds of the toothache tree, *Xanthoxylum alatum* (Rutaceae)(India)).

tootsman = a watcher who observes movements of fish in a river (see toot net).

top belly = the portion of webbing that forms the lower body of a trawl from the foot rope to the fore part of the throat or cod end.

top line = headline (the upper rope of a net to which the net is attached and to which floats are generally attached in such nets as seines and trawls).

top linnet = upper part of a cod trap.

top mop = a tightly tied mass of synthetic yarn in various configurations with cork or styrofoam used as a spawning medium in aquaria for fish that normally lay eggs on vegetation. The floating mop is used for species that spawn at or near the water surface or high in the water column. Also called floating mop.

top panel = all sections of net in the upper part of a trawl.

top rope = headline (the upper rope of a net to which the net is attached and to which floats are generally attached in such nets as seines and trawls).

top wedge = that part of the netting in a trawl that comes above the belly.

top-and-bottom float = in angling, a float attached to the line at both the top and the bottom.

top-side chafer = netting meant to protect the top or side panels of the codend from wear should the rear end of the trawl twist along its axis during fishing. May be illegal as they inhibit net selection.

tope = 1) *Galeorhinus galeus* (Triakidae).

tope = 2) to drink alcohol in large quantities continuously.

tope = 3) a dome-shaped monument built by Buddhists.

tophomeotype = an unofficial term in nomenclature for a specimen from the type locality of a species identified by an authority.

topical = confined to a small area, local.

topless = it is illegal for a woman to be topless in Liverpool, England, unless she happens to be a clerk in a tropical fish shop.

toponym = a scientific name based on a locality or the place-name itself.

topotype = a specimen collected at the type locality but not necessarily part of the type series.

topotypical population = population occurring at the type locality from which the type specimen was taken.

topwater = 1) a floating hard bait that creates some surface disturbance when retrieved.

topwater = 2) any lure designed to be fished at the surface.

topwater crankbait = an imitation fish or plug designed to dive when retrieved slowly.

topwater lure = a lure that floats and is used to catch fish at the surface.

topwater popper = topwater lure.

torch fishing = torching.

torch net = a fixed net into which fish are led by a boat carrying torches or electric lights.

torch-and-dip = torching.

torching = attracting fish at night by means of a light so they may be easily netted or speared.

tori line= the line from a tori pole.

tori pole = a pole with a main line from which streamers are hung at regular intervals to scare away seabirds from baits attached to a pelagic longline.

tornbelly = a herring with its belly torn open.

toro = the fatty tuna belly prized in sushi/sashimi (Japanese).

torpedoform = the typical body form of most fishes.

torpid = inactive, unresponsive, e.g. in aestivation or hibernation.

torquette = a piece of netting fixed inside the rear of the codend to improve its closing by the codline.

torrent = a swift stream of water, inhabited by specially adapted fishes.

torrenticole = living in torrents.

**torus semicirculari** = enlargements of the posterior floor of each optic ventricle separated by the valvuli cerebelli, *q.v.*

**total allowable catch** = the weight of fish of a given species or type caught by commercial fishing in any year or season. TACs are set by governments to regulate the fishery and manage the resource. Abbreviated as TAC. Sometimes called TACC or total allowable commercial catch.

**total allowable commercial catch** = total allowable catch. Abbreviated as TACC.

**total catch** = all the fish taken by fishing gear and hauled on board a vessel. Discards are those fish thrown away, the remainder is the landed catch or retained catch. The landed catch can be divided into the target catch and the incidental catch. Species may shift between these categories depending on such factors as size, popularity, season, etc.

**total dissolved solids** = a measure of water quality, the total residue remaining after evaporation of a water sample filtered to remove suspended matter larger than 1.0 mm; inorganic salts (principally calcium, magnesium, potassium, sodium, bicarbonates, chlorides and sulfates) and small amounts of organic matter that are dissolved in water, not suspended like wood pulp particles. Abbreviated as TDS.

**total hardness** = a measure of the total amount of magnesium and calcium salts dissolved in water including carbonates and non-carbonates.

**total length** = the greatest length of the whole body between the most anterior point of the body and the most posterior point, in a straight line, not over the curve of the body. Sometimes, when there are two equal lobes, the caudal rays are squeezed together and their tip is taken as the most posterior point, or the longest lobe is squeezed to the midline (maximum length or extreme tip length). Also an imaginary line may be drawn between the two lobe tips and length to its mid-point taken as the most posterior point (total auxiliary length or bilobular length). Usually the tip of the most posterior lobe of the fin in normal position is taken as the posteriormost point (total normal length or natural tip length). Total length is used in Amphioxii, Myxini, Petromyzontiformes, usually in Elasmobranchii and sometimes in other fishes. Standard length, *q.v.*, is usually employed with Teleostei. Abbreviated TL.

**total mortality** = mortality attributed to both fishing and natural causes.

**total mortality rate** = the number of fish which die during a year or season, divided by the initial number. Also called actual mortality rate, coefficient of mortality. Abbreviated as Z.

**total production** = production (the total elaboration of new body substance in a stock in a unit of time, irrespective of whether or not it survives to the end of that time. Also called net production).

**total productivity** = in an aquaculture pond, the natural productivity plus that due to fertilisation and artificial feeding.

**total shotting capacity** = the amount of weight needed to set a float so only the tip is showing.

total spawners = synchronous development of eggs and sperm in a spawning population with all sex products released over a short period of time, a week or so.

totally suppressed name = in nomenclature the older of two homonyms suppressed for the purposes of the Principle of Priority and the Principle of Homonymy (both *q.v.*).

tote = a fish tote is a bag designed to carry fish. Waterproof, insulated and puncture proof. May be used for transporting live fish or keeping dead captured fish in a fresh condition.

tournament = a fishing competition.

tow = to pull a fishing net such as a trawl. See towed net.

tow dragging = a type of Danish seining.

tow-blown = a blown herring.

towed net = any net which is pulled through the water, the water draining through the meshes but the fish being retained.

towfish = an instrument, e.g. a side scan sonar, towed behind a ship.

towing chain = chain bracket (a chain used on an otter board in place of a bracket. Also called angle iron chain, back board chain, board chain, chain triangle).

towing engine = a winch with one or more rope storage drums for paying out, hauling in or making fast tow ropes of a trawl.

towing warp = the heavy cable used to tow trawls, seines, etc. May be up to 2 km long on large trawlers.

towing winch = towing engine.

township = a division of land comprising 36 sections or 46 square miles; may be used as part of the collection information indicating where the specimens were caught.

toxaphene = an insecticide that has been used to kill unwanted fish in ponds and lakes. Possibly carcinogenic and now banned for general use.

toxic = poisonous.

toxin = a poisonous chemical secreted by an organism. Many fish toxins are neurotoxins and particularly dangerous, and there are some hepatotoxins.

toxactinium = a long curved projection from the anterior end of the priapium (*q.v.*) in some Phallostethidae.

TP = abbreviation for terminal phase in diandric fishes possessing two different types of males, a large, brightly-coloured and aggressive terminal phase (TP) and a smaller, drab and relatively

non-aggressive initial phase (IP), e.g. in *Thalassoma lunare* (Labridae). The TP has priority access to food and spawning females. On the death or removal of a TP, the first-ranking IP becomes the next TP (after first checking the reef thoroughly to make sure the TP is gone).

tr. = transverse row of scales, diagonal scale row (the almost vertical rows of scales slanting backwards and downwards across the sides of the body. Divided into scales above the lateral line starting at the front of the dorsal fin (from, but not including, the scale in the middorsal row, to but not including, the lateral line scales) and below the lateral line similarly ending at the front of the anal fin. The number of transverse rows themselves along the body may also be counted).

trabecula (plural trabeculae) = an embryonic cartilaginous rod, one lying on either side of the anterior brain in front of the notochord and helping form the skull. The separation of the trabeculae has consequences for the eyeball size and brain during development.

trabeculae = plural of trabecula.

trabecular = spongy, e.g. spongy bone.

trace = the British term for a leader (wire or strong monofilament line between the hook and main line as a protection against teeth or rough substrates, or weaker line to ensure that a large fish does not break off a long length of line which can entangle and kill it).

trace fossil = ichnotaxon (a taxon based on the fossilised work of an animal, e.g. trails, burrows, etc.).

tracing predator = see tracking predator.

track = 1) a line on a map connecting disjunct populations of a species.

track = 2) a line on a map connecting disjunct species of a monophyletic group.

tracking predator = a predator intermediate between an ambush and a pursuing predator, searching slowly for food and taking prey that is not a strong swimmer or is inactive, such as at night, e.g. lepidophagous fish, eels feeding at night, archer fish, mormyrids.

tract = 1) an expanse of land or water.

tract = 2) a system of organs and tissues that together perform a special function, e.g. digestive or alimentary tract.

tract = 3) a stretch or lapse of time (archaic).

tradable permit = a fishery resource that can be exchanged through a free or controlled permit market.

trade-off = balancing of factors not achievable at the same time, e.g. maximum economic yield and maximum sustainable yield.

trader = 1) a vessel owner who purchases fish from fishermen in exchange for cash or supplies, operating outside the established merchant system (Newfoundland).

trader = 2) the vessel engaged in collecting fish from fishermen and in carrying supplies (Newfoundland).

trading = collecting fish from settlements in exchange for cash and supplies outside the established merchant system in Newfoundland.

traditional fishing zone = an area of water where a group of people living nearby traditionally fish on a subsistence basis.

tragedy of the commons = the decline or loss of a common property natural resource through continued exploitation after the maximum sustainable yield has been reached. Unhappily true of many fisheries where no one "owns" them and so no one has a vested interest in preserving them.

trail = 1) a wooden spreader used at the leading end of the wing of a trawl or seine to keep the net spread vertically.

TRAIL = 2) abbreviation for Transgenerational Isotope Labelling.

trailer = 1) the hook at the end of the line in fly-fishing (Scottish dialect). Also called end fly.

trailer = 2) any item attached to the rear hook of a lure to add attraction or bulk, e.g. a rubber grub.

trailer hook = trailing hook.

trailing = 1) trawling.

trailing = 2) trolling a fishing line (or trolling line) behind a moving boat. In commercial fisheries a speed of 2-10 knots is used to catch tunas and their relatives.

trailing edge = any rear part of a fish structure. Opposite of leading edge.

trailing gut = an extension of the intestine that trails behind larval oviparous fishes and is used for absorption of nutrients, e.g. in melanostomiats, the argentinid *Microstoma microstoma*.

trailing hook = an extra hook added to a single-hook lure. Also called cheater hook.

trailing mop = a tightly tied mass of synthetic yarn in various configurations with cork or styrofoam used as a spawning medium in aquaria for fish that normally lay eggs on vegetation. The trailing mop is used for species that spawn at all water levels and is a mix of top and bottom mops, reaching from the surface to trail along the bottom.

trailing shuck = a section of synthetic yarn tied to the back of an artificial fly to imitate the shedding case of an insect.

train house = a structure on a fishing premises in which cod livers (and seal and whale blubber) are rendered.

train oil = unrefined cod liver oil (and also the oil from seal and whale blubber). Used in candles and lamps and, mixed with powdered red ochre, as a paint for fish sheds and barns.

traine oil = train oil.

training wall = a wall or jetty to direct current flow.

trains = lines of sunken herring-nets in the Isle of Man.

trait = 1) any character or property of an organism.

trait = 2) in systematics, a trait is a genetically determined feature that is not fixed in a population and individuals may show different traits of any character, e.g. presence, absence, size, shape, etc.

tram oil = unrefined cod liver oil used to make candles and in lamps.

trammel net = a net made up of a fine-meshed net between two large-meshed nets extended between two ropes and set up in a tidal current or river, the fish being trapped by becoming wrapped in the fine-meshed net that forms bags around the fish.

tran = uncleansed fish fat or fish oil.

tran oil = oil from decomposed fish.

trancher = armouring (the outer wall of large mesh netting forming part of a trammel net, *q.v.*. Also called outer net, outer wall, outwall, outwalling, wall, walling, windows).

trans- (prefix) = across.

*trans. nov.* = abbreviation for *translatio nova*, meaning new transfer, and used to indicate that a taxon has been altered in position but retains the epithet from its name in the former position.

trans-national fishery = a fishery in which the stock(s) crosses the EEZ, *q.v.*, of two or more countries.

transboundary stock = a stock of fish that migrates across international boundaries or other jurisdictional boundaries.

transcribe = to make an exact copy from one written work to another, *cf.* translate and transliterate.

transcription = the product of transcribing.

transect = 1) to divide by cutting transversely.

transect = 2) a sample area in a long continuous strip. See also strip transect and visual transect.

transfauna = the movement of a transferred species.

transfer = 1) in taxonomy, a change in the position of a taxon, with or without a change in name.

transfer = 2) a transferred species.

transfer brooder = a reproductive guild (*q.v.*) where the eggs are carried in some fashion before deposition - in cupped pelvic fins, inside the body cavity or in a cluster depending from the genital pore. After deposition these type is most similar to non-guarding phytophilous, e.g. *Oryzias latipes* and *Callichthys fasciatus*.

transferred name = *nomen translatum* (an available name which has been altered (usually in ending only), the change depending on transfer from one taxonomic rank to another, or from one taxon to another. Authorship and date remains as for the original name).

transferred species = any species intentionally or accidentally transported and released by humans into an environment outside its present range.

transform = metamorphosis in lampreys (Petromyzontidae).

transformation stage = a stage in fish development where larval features are lost and juvenile and adult characters are acquired. Changes may be relatively minor or quite dramatic, depending on the taxon, e.g. adult eels are very different in form from their larval leptocephali.

Transgenerational Isotope Labelling = a stable isotope, e.g. barium, given to a female fish just before spawning so that the young fish have a chemical signature in their otoliths and can be tracked. Abbreviated as TRAIL.

transgenic fish = a fish altered by introducing new genetic material (DNA) into its genetic composition, usually via microinjection of DNA into a fertilized egg.

transgression = marine transgression (land flooded by the sea as land sinks or sea level rises).

transhipping = transferring fish from the catch vessel to a factory ship. Also called klondiking.

transition area = an area where one water type or bottom composition changes to another.

transition zone = an abrupt change or lack of structure between two regions of an otolith. May occur during metamorphosis from a larval stage, transition from the sea to fresh water, etc.

transitional = what happens between two equilibrium states corresponding to two different fishing regimes, i.e. the non-equilibrium trajectory between two states, e.g. a regulation may increase equilibrium yield by two-fold but the transition between the two levels of yield will involve a short-term loss in yield.

translate = the rendering of words from one language to another, cf. transcribe and transliterate.

translation = the product of translating.

*translatio nova* = new transfer, used to indicate a taxon has been changed in position either horizontally to another genus or vertically to a different rank. Abbreviated as *trans. nov.*

transliterate = to change the letters of one alphabet to the letters of another (still requires translation between languages). Applies where scientific names are formed from words not in Latin and have to be transliterated as all scientific names must be in Latin. cf. transcribe and translate.

transliteration = the product of transliterating.

translocation = movement of native or introduced species to waters or habitats outside their natural or previous distribution.

translucent zone = a light zone in an otolith that, relative to other zones, allows the passage of light. Appears dark under reflected light. Also called hyaline zone, but this is not preferred.

transnational fishery = a fishery in which the same resource stock(s) crosses the exclusive economic zones of two or more countries.

transparent goldfish = a form of goldfish with transparent skin and scales allowing internal organs to be seen, and purportedly an aid in studying anatomy and physiology.

transplanted species = transferred species.

transport host = paratenic host (a fish which serves as an additional or optional intermediate host for a parasite. No development of the parasite occurs but the host fish may serve as an essential link in the parasite life cycle).

transporter = net drum (a wide spool over which a trawl or purse seine is hauled in, usually hydraulically powered. Also called net roller).

transshipment = act of transferring the catch from one fishing vessel to either another fishing vessel or to a vessel used solely for the carriage of cargo.

transvasement = an artificial movement of water from one river basin to another, to solve such problems as floods and droughts.

transverse = from side to side; extending across.

transverse bar = a bar which extends roughly at right angles to the shoreline.

transverse canal = supratemporal canal (the cephalic lateral line canal (q.v.) running across the top of the head joining the lateral canals. Abbreviated ST).

transverse curtain = a fold of integument attached to the roof of the mouth behind the upper jaw.

transverse lingual lamina = a cusp found on the tongue of lampreys (Petromyzontidae). These laminae consist of an anterior or transverse lamina.

transverse process = parapophysis (plural parapophyses)(a long, transverse process arising from the abdominal vertebral centrum. Parapophyses serve to support epipleural ribs (*q.v.*) when present and, in Gadidae, the gas bladder. In Clupeiformes they are not fused to the vertebrae. Also called basopophysis and basal process).

transverse scale row = diagonal scale row (the almost vertical rows of scales slanting backwards and downwards across the sides of the body. Divided into scales above the lateral line starting at the front of the dorsal fin (from, but not including, the scale in the middorsal row, to but not including, the lateral line scales) and below the lateral line similarly ending at the front of the anal fin. The number of transverse rows themselves along the body may also be counted).

transverse septum = the combined posterior parietal pericardium and the anterior parietal peritoneum separating the pericardial and peritoneal cavities.

trant = peddling or hawking fish. Also spelled traunt.

tranter = a hawker of fish. Also spelled traunter.

trap (noun) = 1) fish trap (a spring-loaded trap made of netting on a frame that closes over a fish. The two rectangular halves of the trap are spread apart from the central spring mechanism. The fish is attracted by bait or a dummy fish that the fish sought tries to fight, e.g. a wooden male salmon painted in spawning colours. See also shutter trap).

trap (noun) = 2) trap net.

trap (verb) = 3) the taking of cod or salmon with any type of fixed gear or trap in the coastal fishery (Newfoundland).

trap and haul program = a programme to collect fish at a given point, transport them to a different point, and release them.

trap berth = an inshore area suitable for setting a cod trap and assigned by custom or assignment to a vessel, a crew or a family (Newfoundland).

trap boat = trap skiff.

trap buoy = a buoy used to mark and/or suspend a cod trap.

trap cag = trap buoy.

trap crew = a group of men engaged on the share system to fish under a skipper with cod traps (Newfoundland).

trap fish = cod caught in a cod trap, usually of a small size (Newfoundland).

trap fisherman = a fisherman operating a trap, e.g. a cod trap in Newfoundland.

trap fishery = the capture of fish through trap fishing. In Newfoundland, refers principally to catching cod in cod traps.

trap fishing = fish capture by means of confining in enclosed spaces, e.g. in traps, pots, pound nets, tuna traps, fyke nets, etc.

trap gear = the floats, markers, buoys, leader, etc, used in placing a cod trap in the water.

trap glut = a seasonal surplus of cod taken in cod traps during the inshore migration (Newfoundland).

trap keg = trap buoy.

trap lead = a lead weight used to fix a cod trap in place (Newfoundland).

trap leader = a length of net stretching from the shore to a cod trap to guide fish into the entrance (Newfoundland).

trap line = a series of trap nets set out at regular intervals.

trap linnet = twine knitted into meshes to form a cod trap (Newfoundland).

trap loft = a room or area of fishing premises where cod traps and other nets are kept for winter storage and repair (Newfoundland).

trap man = trap fisherman.

trap master = a member of a Labrador fishing crew in charge of setting and hauling a cod trap.

trap mooring = an anchor, a line and a buoy used to secure a cod trap in place in the water (Newfoundland).

trap net = a net composed of a series of funnels with the mouths kept open by hoops; nets or fences set in streams or along coasts direct fish into this holding container for easy removal. Also called pound net.

trap rig = a rig with a trailer hook trailer hook.

trap season = in Newfoundland, late June to early August, for setting and hauling cod traps.

trap setter = a fishing vessel used for setting traps, pots, pound nets, fyke nets, etc.

trap skiff = a vessel used from the beginning of the eighteenth century to the early 1900s, easily rowed, with a single sail, good carrying capacity, light and cheap to build. Its name came from

its main use in setting and tending inshore fish traps and nets. Gradually replaced by the dory which could be stacked one inside the other on offshore schooners.

trap skipper = trap master.

trap system = trap fishing.

trap time = trap season.

trap voyage = 1) the summer fishery in coastal waters in which cod traps are used (Newfoundland).

trap voyage = 2) the period of the summer fishery in coastal waters in which cod traps are used (Newfoundland).

trap voyage = 3) the cod caught on a trap voyage (Newfoundland).

trapping = trap fishery.

trapping berth = a particular area of the fishing grounds assigned by custom or lot to a vessel, crew or family (Newfoundland).

trapping crew = a group engaged or shipped by a merchant, planter or skipper to conduct afloat and on shore the various branches and operations of taking and processing cod with fixed gear or traps (Newfoundland).

trapping season = June to early August, when cod and salmon are taken in coastal waters by means of stationary trap nets (Newfoundland).

trapping voyage = 1) the enterprise of the summer fishery in coastal waters during which cod traps are used (Newfoundland).

trapping voyage = 2) the period of the summer fishery in coastal waters during which cod traps are used (Newfoundland).

trash catcher = trash collector.

trash collector = a wirefence across a stream used to retain debris and create a dam and a plunge pool; makes habitat for fish and collects gravel for spawning habitat. Also called debris catcher, trash catcher or grizzly.

trash fish = those fish which, if caught, are usually thrown away. Those fishes not sought after in a fishery. Also called discarded fish. In some cases these fish are used for human consumption or as fishmeal.

trāsi = a fermented and salted fish paste from Java. See also garum, balachong and ngāpi.

trat = 1) a line with baited hooks at intervals, laid near the water's edge, fastened down at each end, and meant to catch fish when the tide comes in (Yorkshire dialect).

trat = 2) a kind of fishing line attached to a large float, which turns over when a fish is hooked.

traunt = trant.

traunter = tranter.

traveller = a wooden device or stick for hauling a trawl line (Newfoundland).

trawl = 1) a bag-shaped net towed behind a ship either along the sea floor or in midwater, having a buoyed head rope and a weighted foot rope to keep the net mouth open. It may be towed by one or two ships.

trawl = 2) in Newfoundland, a type of gear comprising a series of longlines of about 100 metres with short, ca. 1 m baited leaders or suds spaced at about 2 m intervals. These longlines were set to float just above the sea floor.

trawl anchor = a simple two-fluked anchor, *q.v.*, used to secure each end of a line of hooks to prevent drifting from position.

trawl board = otter board (a large, heavy, flat piece of wood and metal on each side of the mouth of an otter trawl; the boards plane or shear through the water and keep the net mouth open).

trawl door = otter board (a large, heavy, flat piece of wood and metal on each side of the mouth of an otter trawl; the boards plane or shear through the water and keep the net mouth open).

trawl fishing = a series of hooks on snoods set along one line. Also called spilliard fishing, spillet fishing or bultow fishing. See also boulter, spiller, trot line, longline, etc.

trawl gallows = a structure on a trawler used to raise the otter boards when working the trawl. Usually an H bar with bracket attachments to the deck and a heavy pulley at the top where the trawl warp is pulled through.

trawl gear = trawl (2).

trawl head = a strong, heart-shaped iron frame fitted at each end of a trawl beam to raise it about one metre off the sea bed. The after side is straight and slopes upward of each head to stake the ropes or wires by which the trawl is towed. The sides of the net are seized or lashed at a point close to the ground. Also called head iron and sledge.

trawl knot = tub knot.

trawl tub = a container or barrel to keep the trawl (2) in.

trawl winch = the winches used to set or haul a trawl.

trawl-roller = a device attached to the gunwale of a dory to haul a trawl in shallow water.

trawler = a vessel that operates a trawl net, trawling being one of the most important commercial fishing methods.

trawling = the operation of a trawl.

tray pack = packaging for fish and other seafood consisting of a shallow, clear or foam-plastic tray covered in transparent film. An absorbent paper pad lies under the fish to absorb moisture.

trayne oil = train oil.

treading eels = detecting eels lying dormant in mud by treading on them, or stirring up mud in a swamp to suffocate and thereby capture eels.

treaty coast = treaty shore.

treaty shore = French shore (the coast of Newfoundland where the French had fishing and curing rights, varying with time (*cf.* English shore). Used to run from Cape St. John to Cape Ray up until 1904 when access was denied).

treble hook = a hook with three points, composed of a single shaft or three shafts attached together.

Trek fish = a parody of the Jesus fish and Darwin fish (both *q.v.*) showing an affection for the TV show Star Trek. There are many other variations on the simple fish symbol, comprised of two intersecting arcs, but only the three mentioned here are listed.

trellis drainage system = a system found where streams run parallel to structures in the bedrock with minor tributaries coming in at right angles. See also annular, dendritic, deranged, parallel and rectangular drainage systems.

trench = an elongate and very deep depression with steep sides in the sea floor, *cf.* trough.

trenchant = sharp, keen, as the teeth of sharks; firmly imbedded; compressed to a sharp edge; incisive, penetrating; sharply defined.

trend = turning and winding of a river or estuary.

tri- (prefix) = three, thrice, threefold.

triacylglycerol = an organic compound used as a lipid store in Nototheniidae.

triangle taper = a special taper of a fly line with a continuous taper and a thin running line; facilitates roll casts.

Triassic = a geological period of the Mesozoic Era ca. 245-210 million years ago. Abbreviated as T<sub>R</sub>.

tribe = 1) a category of the family-group subordinate to the subfamily.

tribe = 2) an individual taxon of the category "tribe". Its recommended ending is -ini.

tributary = a stream or river that enters a larger body of water, either another river or a lake.

tricaine methanesulphonate = MS-222, a fish anaesthetic applied by immersion in dosed water.

trichodiniasis = a disease caused by a ciliated protozoan (*Trichodina* sp.). The parasite is quite common and not always disease associated. Lethargy, flashing, mucus production (white to bluish tinges), skin ulcers, frayed fins and frayed gills are symptoms. Respiratory distress results if gills are severely affected.

trickle filter = a wet/dry filter for aquaria. Water is dripped from a spray bar or drip plate over some media which is also exposed to the air. This promotes very efficient nitrification. The medium may be small pieces of plastic, double-layered spiral, q.v., or anything else which will support bacteria and not easily clog.

tricuspid = with three points or cusps, e.g. tricuspid tooth.

trident = a fish spear with three points, often barbed.

trifid = divided into three.

trifurcate = dividing into three.

trigeminal ganglion = tactile neurons of the fifth cranial nerve between the eye and ear.

trigeminal placode = the ectodermal rudiment of the trigeminal ganglion.

trigger = any element that entices a fish to strike, e.g. sight, smell, taste texture, vibration, sound, technique, etc.

trigger activation = the process of pulling, pushing or biting a device by a fish that triggers release of food in aquaculture.

trigger actuation = trigger activation.

trigger point = a catch level that indicates a need for management review.

trigger rate = a catch rate that indicates a need for management review.

trigger TAC = a total allowable catch level that triggers some form of management action when it is reached.

triangular = with three surfaces, e.g. body of *Lactophrys*.

trilene knot = a hook knot with the line passed twice through the eye, wrapped around the line five times and the free end passed through the small loop next to the eye. Has a strength of 90% or more. Used to tie line to hooks, swivels, snaps and lures. Various websites have animated steps showing how to tie this knot.

trilobate = having three lobes.

trim net = a bag net smaller than a stow net, *q.v.*. Used for catching whitebait and eels.

trimethylamine oxide = a non-toxic product made from toxic ammonia and used by sharks to keep the body fluid concentration high to prevent loss of water to the sea. Other marine fish may develop a trimethylamine (TMA) content in their flesh through reduction by bacterial action. A TMA of 15 mg per 100 g of fish is considered unmarketable.

trimethylaminuria = fish odour (a genetic disorder giving a rotting fish odour to a person's breath, urine and sweat. Caused by lack of an enzyme that would process an odour-causing protein, trimethylamine. Also called fish odour syndrome).

trimmed = fish with fins removed including the tail.

trimmer = a person who removes irregularities from a fish fillet.

trimming = removal of unsightly or inedible parts of a fish product.

trimming table = a table on which a trimmer works.

trimmings = the cut off waste resulting from preparation of fish fillets.

trinal gill net = a coastal Japanese trammel net comprising three layers, the inner with a small mesh that catches small fish directly, and also forms a pocket around larger fish which extrude through the opposite large mesh outer layer. Fished at 30-45 m and hauled 2-3 hours after setting.

trinomen (plural trinomina) = a name consisting of three words, the generic name, the specific name, and the subspecific name, which together constitute the scientific name of a subspecies.

trinomial combination = trinomen.

trinomial name = trinomen.

trinomina = plural of trinomen.

trip = 1) the period when a fishing boat is away from port.

trip = 2) the number of fish caught in one angling or commercial fishing excursion.

trip frequency limit = a restriction on the number of trips in a given time period.

trip limit = the maximum catch that a boat is allowed to bring back from any one trip. Usually agreed between fishers and the government so that fishing can be carried out though a longer season and/or more people have a chance to fish. Also called landing limit.

tripartite = having three parts.

triplo- (prefix) = threefold.

triploid = an abnormal chromosome complement, three times the number in gametes. The usual complement in a species is twice that in gametes, e.g. artificially induced in *Ctenopharyngodon idella* for stocking purposes so that escapees cannot reproduce. The process of turning fish into triploid involves either heat, cold, pressure or chemical shocks during the period just after fertilisation. The process only works on female fish; the male fish are only partially affected.

triplobyte = an unofficial term in nomenclature for a single specimen used as the holotype for three separate and new species.

tripolyphosphate = an additive used as a dip to reduce drip loss in prepared fish.

tripus = the fourth of the four Weberian ossicles, *q.v.*, so-named for its three processes. The anterior process joins it to the intercalarium by a ligament, the median process joins it to the third vertebral centrum and the third, posterior process contacts the anterior wall of the gas bladder through a transformator process.

triqueta = triquetra.

triquetra = three fish or fish outlines interlinked. A symbol of the Holy Trinity (Father, Son, Holy Ghost) used by the Celtic Christian Church but dating before Christianity.

triramous = having three branches.

Triton = a merman, the son of Poseidon and Amphitrite, human above the waist but fish-shaped below. Known as the trumpeter of the sea since he blew on a conch.

tritor = hardened elements of the crushing surface of a chimaeroid tooth plate.

trituration = the act of reducing to fine particles as with food.

trituration teeth = teeth imbedded in the bony matrix of the jaws as in Tetraodontidae.

tritors = teeth with grinding surfaces; hardened points on the tooth plates of Holocephali.

trivial name = an expression used by Linnaeus (as *nomen triviale*) and others for the specific name. Applied by some authors in the same sense as vernacular name.

troglo- (prefix) = pertaining to subterranean terrestrial and aquatic systems. Note that now often restricted to terrestrial systems, stygo- is for aquatic systems.

troglobiont = a true cave dweller; a troglobite.

troglobite = an obligate cave dweller; one not existing outside a cave or subterranean habitat

troglodyte = cave-living or subterranean organism.

troglomorphy = morphological modifications through evolution in cave dwellers.

troglophile = a non-obligate cave visitor or dweller; able also to live above ground.

trogloxene = stygoxene (an organism found actively or accidentally in a hypogean environment).

troll = 1) trolling (1).

troll = 2) a reel of a fishing rod.

troll fishery = a commercial fishery in marine waters where gear is limited to multiple lures or baits trolled behind the boat (or troller), attached to lines suspended from long poles or outriggers. The lines are often hauled in by powered equipment.

troller = a vessel used in trolling.

trolling = 1) trailing a fishing line (or trolling line) behind a moving boat. In commercial fisheries a speed of 2-10 knots is used to catch tunas and their relatives. Also a technique used on lakes in sport fishing, using a trolling motor.

trolling = 2) fishing with a bait that follows the current, often suspended from a float.

trolling motor = a small, electric motor, usually mounted on the bow of a boat, used to position the boat and manoeuvre quietly while fishing.

trolling plug = a saltwater plug with strong hooks and a big lip for deep diving.

trolling rod = a fishing rod used to drag a lure behind a moving boat.

trolling spoon = spoon, *q.v.*

tronçon = a flatfish steak cut on the bone. Sometimes spelled troncon.

troop = 1) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for dogfish.

troop = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for tunas.

trootens = small trout (Northumberland dialect).

trootie = a small trout; also an endearment for small child (Scottish dialect). See also old trout.

trooty = trootie.

-trophic (suffix) = nourishment.

trophic = pertaining to nutrition, the gathering and eating of food.

trophic cascade = a disruption of the food chain by the removal of a key species, often a predator, ramifying through the ecosystem allowing prey to flourish and with a marked effect even on numbers of zooplankton near the base of the food chain. This alters the structure of the ecosystem and, in the case of Atlantic cod in eastern Canada, probably prevents their recovery as numerous smaller fish feed on young cod.

trophic class = the position in the food chain or web occupied by a species.

trophic dead end = overfishing reducing stocks of fish which are then replaced by large numbers of jellyfish. The jellyfish consume any eggs and larvae produced by surviving fish, making recovery of fish stocks unlikely to impossible.

trophic depression = decline in production in a reservoir with age. The decline is due to a reduction in nutrients as these have been leached out of surrounding soils and loss of nutrients from a high flushing rate. Compare tropic upsurge.

trophic guild = a group of unrelated fish that feed on similar food items, e.g. benthivore, detritivore, herbivore, insectivore, omnivore, planktivore, piscivore, etc (all q.v.). Also called feeding guild.

trophic upsurge = high productivity in a newly filled reservoir because of nutrients leaching from surrounding soils, and from soils and organic materials inundated by the new reservoir.

trophogenic layer = the water layer where photosynthetic production of organic matter exceeds destruction.

trophogenic zone = trophogenic layer.

trophology = the study of feeding and food relationships.

tropholytic layer = the deep zone of a lake where food is used faster than it can be produced.

tropholytic zone = tropholytic layer.

trophonema (plural trophonemata) = a long filament from the uterus which secretes a nutritive fluid, hydrotroph, which is absorbed by the embryo's yolk sac or taken in through the mouth or spiracles. Found in Rajiformes.

trophotaenia (plural trophotaeniae) = a ribbon-like extension from the anal or urogenital region of embryonic Goodeidae, *Parabrotula* (Zoarcidae), *Oligopus* and *Microbrotula* (Ophidioidei) which intermingles with ovigerous folds and transfer nutrient material between mother and young.

trophotaxis = movement towards or away from food.

trophy = a fish caught by an angler of large or record size for the species and area.

trophy mount = a taxidermy mount of a trophy.

tropibasic skull = a skull with eyes set close together, found in most Teleostei. Also called tropitrablic skull since it is the narrow distance between trabeculae which fuse early in development by means of a transverse commissure, the common trabecule, which later forms the nasal and interorbital septa. The skull is arched and vaulted, laterally flattened and usually much higher than broad. The endochondral floor is narrow and the brain is relatively short since it ends at the interorbital septum instead of the ethmoid block. A more advanced condition than in a platybasic skull, *q.v.*

tropical fish = 1) small aquarium fishes from fresh and marine waters, usually brightly coloured or of unusual body form.

tropical fish = 2) fish from the tropics.

tropical region = ocean waters between the 20°C winter isotherms in the Southern and Northern Hemispheres.

-tropism (suffix) = to turn.

tropism = orientation or growth of a non-motile organism or one of its parts towards or away from a stimulus; sometimes used for motile organisms like fish but taxis is more appropriate.

tropitrablic skull = tropibasic skull.

trot line = a longline used in lakes and streams with hooks at regular intervals. Primarily used in commercial fishing, e.g. for catfish.

trotting = fishing with a bait allowed to move with the river current, the bait usually, but not always, being suspended from a float or bobber.

trough = 1) a long and broad depression in the sea floor with gently sloping sides, *cf.* trench.

trough = 2) trow.

troubling = a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for goldfish.

trounce = use of a troucer.

troucer = a device used to scare fish into nets by its noise, e.g. iron chains or rings (Newfoundland). See also dasher, douser and thrasher.

troup = 1) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for trout.

troup = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for tunas.

trouser codend = double codend (two codends joined at the leading edge. Used on rough grounds to reduce the chance of total loss of a catch).

trouser trawl = a trawl net with a pair of cod ends used in mesh selectivity experiments.

trout = 1) members of the family Salmonidae, such as the brown trout (*Salmo trutta*) and the brook trout (*Salvelinus fontinalis*), the latter strictly a char. The former in particular figures prominently in sport fishing in Europe and has various terms peculiar to its fishery. Many of these terms are in dialects of English or are archaic. Trout comes from the Greek for gnawer. Often used in the singular for more than one trout but trouts is now common usage too.

trout = 2) useless or worthless (slang).

trout = 3) an elderly woman regarded as silly. See also old trout.

trout = 4) to fish for trout.

trout = 5) to curdle or coagulate (obsolete).

trout binning = a method of catching trout by hitting rocks in a stream with a sledge hammer. This stuns the fish and enables the fisher to pick them up.

trout height = the height that a trout can leap from the water, used as a measure or comparison of height.

trout huvie = a basket used for trout.

trout loup = a waterfall or cascade as leaped by trout (Scottish dialect).

trout pellet = small, dry particles of food composite used on trout farms.

trout pest = viral haemorrhagic septicaemia (an acute or chronic disease of salmonids, such as rainbow trout in farm ponds, causing loss of appetite and of schooling behaviour, darkened colour, bleeding, hyaline gills and exophthalmia. It is associated with temperature changes and with the late winter and spring seasons when temperatures are below 8°C. Abbreviated as VHS. Also called Egtved disease).

trout pout = the prominent result of plastic surgery or collagen injections on human lips.

Trout Quintet = the popular name for the Piano Quintet in A major by Franz Schubert, composed in 1819. The popular name derives from the fourth movement being a set of variations on Schubert's earlier "Die Forelle" (The Trout). It was written for piano, violin, viola, cello and, of course, the double bass.

trout reach = trout zone.

trout section = trout zone.

trout worm = 1) any worm (of any species) that catches trout (of any species).

trout worm = 2) a plastic fishing bait available in a wide variety of colours.

trout zone = an area of a river with fast currents, a stony bottom, and a fish fauna having cylindrical bodies.

trout-coloured = white with black, bay or sorrel spots, as in a horse.

trout-pout = trout pout.

trouter = 1) a passenger train which stops at any point requested by anglers on an holiday excursion (Newfoundland).

trouter = 2) a type of rum drunk on the trouter train.

trouter = a trout fisher.

trouter special = trouter (1).

trouter train = trouter (1).

troutin' = trouting.

troutiness = 1) the condition of being trouty.

troutiness = 2) the condition of being trouty, i.e. speckled, spotty.

trouting = 1) fishing for trout.

trouting = 2) angling for freshwater fish in Newfoundland, especially for brook trout (*Salvelinus fontinalis*) as opposed to the commercial fishery for cod, or for brown trout (*Salmo trutta*) in Scotland.

troutlet = a little trout.

troutling = a little trout.

trouts = see trout (1).

trouty = full of trout, containing trout.

trow = 1) a double boat, especially one used in salmon spearing at night with lights where nets cannot be used. It consisted of two single, narrow, flat-bottomed boats, each about ten feet long, fourteen inches extreme breadth, and twelve inches deep, united at the stem and diverging by an angular curve towards their sterns, which are braced together at the top by a piece of flat board. One man usually guides the trows with a pole, whilst another stands with one leg in each trow, holding a leister or spear in his hand ready to strike the fish (English and Scottish dialect). Also spelled trough and several Scottish variants.

trow = 2) Scottish version of trolling.

trow net = castnet (a method of catching fish in shallow waters by throwing a circular net over them; the net opens in the air to a diameter of about 2 metres and sinks rapidly because of weights attached to its margin. The rim of the net has a draw rope that enables it to be closed. Also called throw net).

trowl = to draw gently upwards a line with hooks on it, stretched across a stream, and fastened to a rod at each side (Scottish dialect).

troy ounce = 31.103 g. Abbreviated as oz tr.

truck = goods and supplies received in a truck system.

truck system = an arrangement by which a fisherman and his family were supplied by a merchant with provisions and gear, against the season's catch.

trucking = trawling.

truff = a grilse or salmon of the first year.

truncate = cut off squarely; said of a caudal fin with hind margin straight.

truncus arteriosus = the first part of the arterial vascular system after the bulbus cordis of the heart, q.v. It is not part of the heart as it contains no cardiac fibres, only smooth muscle.

trunk = 1) the body of a fish between the posterior border of the opercular membrane and the vent.

trunk = 2) an oblong wooden box in which fish were packed aboard trawlers.

trunk = 3) a box in which fish are sent to the market. Pierced with holes, in which live fish could be submerged in water when not wanted immediately for market (English dialect).

trunk canal = the lateral line canal on the flank.

trunk hole = an opening in the floor of a fishing stage (q.v.) through which waste was thrown and salt water drawn up (Newfoundland).

trunk ring = one of the dermal plates in members of the Syngnathidae forming a series of rings enclosing the body; trunk rings run from the ring bearing the pectoral fin to the ring with the anus.

trunk shield = a series of overlapping bony plates forming a ring around the trunk of Placoderms, just behind the head and articulating with the head shield in most species.

trunking = taking fish from a trawler to the fish carrier. Also known as boarding and ferrying.

trusty trout = a true friend (English slang).

try = to drain fish livers for oil. Also called dry. See also well.

try the net = to test the catch of fish by hauling in a few yards of the net nearest the boat, before pulling the whole length on board (British dialect).

tsukurimi = raw fish meat sliced and eaten immediately (Japan). Also called sashimi, *q.v.*

tsukadani = whole small fish (and also shellfish meat or seaweed) cooked in a mixture of soya sauce and sugar. The term is usually preceded by the name of the fish (Japan).

tsuke raft = a raft made of bamboo bundles tied together and anchored at sea. Used to attract game fish which seek shade or small prey associated with the raft.

Tsukiji Fish Market = the largest fish market in the world, located in Tokyo, handling over 2000 mt per day.

$T_{TARGET}$  = the target year set by a policy for fish stock to be completely rebuilt.

tub = 1) a puncheon, *q.v.*, sawn in half, used to hold split cod in salt (Newfoundland).

tub = 2) a wooden barrel sawn off at the first hoop above the middle, in which trawl lines are coiled in dory fishing.

tub knot = a special knot tied at the end of the series of linked lines forming a trawl, serving to mark its end.

tube bait = tube lure.

tube fly = a salmon fly tied around a plastic-lined, brass or aluminium tube which then slides freely along the line. Water pressure pulls it down to the terminal treble hook and when a fish takes the hook it slides back up the line making it easier to unhook the fish.

tube lure = a hollow, soft plastic lure with one end a skirt with tentacles.

tubercle = a small, usually hard protuberance or excrescence of the skin.

tubercle, breeding = usually small, raised, epidermal structures on regions of the head, body, or fin rays where two individuals come in contact. May consist of aggregations of non-keratinized epidermal cells, the same with a light, superficial keratinized cuticle, or with substantial number of fully keratinized cells that are organized to form a discrete, usually conical cap. Breeding tubercles may function to maintain body contact between the sexes during spawning; in the defence of nests and territories; in the stimulation of females in courtship; and in some forms perhaps in sex and species recognition. Also called nuptial tubercle. Found in 15 families of 4 orders; Salmoniformes, Gonorhynchiformes, Cypriniformes, and Perciformes (Wiley and Collette, 1970).

tuberculate = with tubercles.

tuberculate ridge = ridge of keratinised tissue in breeding males of some Cyprinidae and Percidae.

tuberculosis = a mycobacterial infection found in aquarium fish, for example (*Mycobacterium marinum* and *M. fortuitum* are known causes.). Fish are lethargic, show little interest in food, exhibit wasting, hollow bellies, popeyes, colour loss, deformities, ulcers, frayed fins, yellow or dark nodules on the body and eyes, and secondary infections. Some fish, such as salmonids, may show no external symptoms although the disease is fatal from internal lesions. Mycobacteriosis is a zoonose, a disease capable of infecting humans, entering through skin abrasions and causing skin granulomas. Poor aquarium conditions can allow this infection to take hold. Fish can be treated with proprietary medicines for mild cases, by antibiotics but severe cases may be untreatable. The fish tank needs disinfection. Also called fish TB and mycobacteriosis.

tuberculum impar = the lateral middle walls of the fourth ventricle of the brain, each expanded as two lobes and meeting in the midline to separate the ventricle into posterior and anterior halves. Also called facial lobe.

tuberous organ = electroreceptor (an organ which detects the presence of an electric current. They are particularly receptive to their own electrical fields and can detect perturbations caused by other fishes and objects. Found, for example, on such weakly electric fishes as mormyrids and gymnotiforms).

tuberous receptor = electroreceptor (an organ which detects the presence of an electric current. They are particularly receptive to their own electrical fields and can detect perturbations caused by other fishes and objects. Found, for example, on such weakly electric fishes as mormyrids and gymnotiforms).

*Tubifex* = small red worms sometimes used as food in aquaria. Since their natural habitat is mud and they are common in polluted areas, they often introduce disease into aquaria. Freeze-dried and irradiated *Tubifex* is safer than the live ones.

tubiform = shaped like a tube.

tubular eye = an elongate tube-shaped eyeball with immense lens and large retina found in some bathypelagic fishes, e.g. *Macropinna*, *Opisthoproctus*, *Argyropelecus*, *Odontostomus*, *Scopelarchus*, *Gigantura*.

tubular trap = 1) a funnel-shaped trap in the form of a long, narrowing tube. Beyond a certain point, any fish in the funnel is unable to turn around or back up because of the narrow space and the fish's own spiny fin rays. Some of these traps may have thorns lining the inner surface, preventing fish from escaping.

tubular trap = 2) a funnel-shaped trap set vertically below a natural or artificial waterfall so that the flow of water carries the fish into the trap.

tubule = an element of the fish kidney.

tuck = 1) to take the fish from a seine by means of a tuck-net.

tuck = 2) to enclose fish in a net by drawing the openings together.

tuck = 3) one of the lines drawn tight in a cast net.

tuck = 4) quantity of fish taken in one haul of a net.

tuck net = a net used to scoop up fish that have been surrounded by a seine, e.g. in the old pilchard fishery of Cornwall. The contents of the tuck net are lifted by baskets into a boat.

tuck seine = a seine operated at sea and hauled into a boat.

tuck net = stop seine (a net positioned across a bay or other delimited area, the fish so enclosed being removed with seines, dip-nets, etc. A bar seine).

tucked half blood knot = a blood knot with the end tucked back through the final loop. Less prone to slipping than the usual half blood knot. Various websites have animated steps showing how to tie this knot.

tucker = a small boat of about 3 tons used in fishing for plaice (Sussex dialect).

tucking line = one of the lines of a fish net drawn tight to enclose the catch.

tucking maund = a shallow basket used to scoop mackerel from a net.

tuft gill = gill tuft (a fluffy cluster of gill filaments, e.g. in Syngnathidae, from Lophobranchii).

tug = 1) to jerk a fishing line up and down or to and fro in the water to attract fish to the bait.

tug = 2) a small and poor quality fish (Shetland Isles dialect).

tug fishing = pulling a line or net through the water.

tug net = a fishing net that is drawn through the water.

tuk trey = the fish sauce of Cambodia, literally fish juice.

tumbling sickness = a parasitic disease of salmonids attacking the nervous system and causing disorientation and tumbling motion.

tumid = swollen, inflated.

tuna = 1) first recorded in America in 1884; may be an anagram of atun, the Spanish for the fish that had been called tunny in English for centuries, from the Latin thunnus.

tuna = 2) confusingly, a Maori word for freshwater eels in New Zealand (*Anguilla dieffenbachii* and *A. australis*).

tuna clipper = a powered fishing boat which can catch and store small fish.

tuna ham = smoked fish sausage. The tuna meat is mixed with salt, sugar, starch and spices and smoked for 12 hours before vacuum packing (Japan).

tuna links = sausages made from tuna.

tuna longline = a longline specifically designed for tuna fishing with 4 or more branch lines in each unit or basket.

tuna ranch = an enclosed net in the sea where adult tuna are kept and fed until they have gained weight, up to 20%. 90% of the fish are sent to Japan.

tuna sticker = slang for a harpoon used to spear tuna in Maritime Canada.

tuna tower = a high platform in a fishing boat from which spotters look for fish. A low platform is a marlin tower.

tunagate = a Canadian political scandal in 1985 when possibly tainted, canned tuna were sold to the public under government authority.

tunica externa = the external layer of the gas bladder, covered by the peritoneum, and made up of elastic fibres and ichthyocol (short needles of collagen). See also tunica interna and submucosa, the other two layers.

tunica interna = the internal layer of the gas bladder made up of thin endoderm and a smooth muscle layer called the muscularis mucosa with longitudinal and circular fibres with some collagen. See also tunica externa and submucosa, the other two layers.

tuning = a means to minimise differences between the observed abundance indices in a stock assessment and the abundance predicted by a model.

tuning fleet = research vessels making regular surveys or commercial vessels where their activities have been well studied over many years; these vessels are used to tune the virtual population analysis.

tunny = 1) one of several species of the family Scombridae.

tunny = 2) an encryption system, one of the fish (fibonacci shrinking) German teleprinter cipher used in World War II. This system was successfully read by the code-breakers at Bletchely Park. See also sturgeon.

tuppeny tightener = a portion of fish and chips costing two pennies, a tightener being a substantial meal (archaic).

turbid = water opaque with suspended matter.

turbinate = resembling an inverted cone.

turbidity = noun for turbid.

Turbot War = an international fishing dispute in 1995 between Canada and the European Union, especially Spain. Canadian officials boarded a Spanish fishing trawler in international waters and arrested its crew. Canada claimed that European Union factory fishing trawlers

were illegally overfishing the nose (*q.v.*) and tail (*q.v.*) of the Grand Banks, just outside Canada's declared 200 nautical mile (370 km) Exclusive Economic Zone.

turd fish = floating excrement.

TURF = abbreviation for territorial use right in fisheries.

turgid = swollen, inflated.

turle knot = a knot used by anglers to tie a hook to a light leader. Various websites have animated steps showing how to tie this knot.

turn = 1) one complete revolution of line around another; when tying a knot. Also called a wrap.

turn = 2) a boatload of fish (Newfoundland).

turn = 3) turning over cod on a flake so they are dried in the sun and wind (Newfoundland).

turn = 4) a measured space on a fishing ground (Cornish dialect).

turn = 5) to have the wrong side uppermost; as in a dead fish.

turn over = a description of how the fly line and leader straighten out at the end of a cast.

turnover = 1) water circulation in lakes in spring and autumn leading to an equalisation of the temperature regime throughout the water column and transport of nutrients into the water column.

turnover = 2) extinction of a species within a given area and its replacement by another.

turnover = 3) part of a population that is lost by death and emigration and replaced by recruitment per unit time. Also called turnover time.

turnover = 4) the ratio of productive energy flow to standing crop biomass in a community or ecosystem.

turnover = 5) the change from a loop to a straight line in a fly cast.

turnover time = turnover (3).

turtle excluder device = any device used to exclude turtles from nets where they may drown; a grid of bars fitted to the mouth of the net allows fish and shrimps to enter but deflects the larger turtles. Abbreviated as TED.

tusied = a fifteenth century word for dressing barbel (preparing this fish for consumption), no longer in use.

tusk = enlarged tooth.

tuttle line = a length of line threaded around the margin of a cast-net and used to draw the net together, trapping the fish. (Newfoundland).

tuyo = a dried product made from *Sardinella* spp., brine salted whole and sun dried (Philippines).

twat = a pregnant goldfish but an urban legend; see twit.

tweet = an exclamation indicating satisfaction, especially when hooking a fish (Scottish dialect).

twice-frozen = fish frozen at sea then thawed for processing onshore and then re-frozen. Also called double-frozen or refrozen.

twice-laid = a dish of cod mashed with potatoes (Newfoundland).

twilight zone = the midwater zone of dim light between the sunlit upper waters and the completely dark deeper waters.

twin body trawl = two small bottom trawls joined with the inner wings removed and fished as a unit.

twin otter trawl = twin rig.

twin rig = two otter trawls joined in the centre by a bridle or at the wing ends and fished side by side and towed from a single boat. Also called twin otter trawl.

twine = cotton, hemp or more recently nylon thread used in making fishnets.

twine captain = a man in charge of nets and other fishing gear in the Newfoundland deep-sea trawler fishery.

twine gurdy = rotating device from which thread or twine is uncoiled when knitting or making a fish net.

twine house = twine loft.

twine loft = a room or area of fishing premises in which nets are stored and repaired.

twine mender = net mender.

twine needle = a device, originally of wood or bone, for knitting or making fish nets.

twine store = twine loft.

twine throw = twine gurdy.

twist disease = whirling disease (a parasitic disease of trout caused by the myxosporidean protozoan *Myxosoma cerebralis*. The parasite enters spine of the fish at a stage before the cartilage has turned to bone. Causes bent spines which force the fish to swim in the

characteristic "whirling" motion, that is also called tail hunting. The spores of the parasites can remain in the mud of ponds for a long time. Also called black tail disease).

twisted dropper loop = a knot used in angling to attach a hook to any point along the line such that it does not tangle. It is a variation of a standard dropper loop but with a twist in the main loop. Various websites have animated steps showing how to tie this knot.

twit = a "pregnant" goldfish, supposedly a term used in Australia and the subject of much internet debate and usage in trivia questions. See also twat.

twitch = a fast but not violent movement of a rod tip when angling to tighten a slack line and/or move a lure erratically.

twitch twice = a strain of zebrafish; see space cadet.

twitching = in angling, small movements of the rod tip or line to move the bait and induce a fish to bite.

two boat lift net = a large coastal Japanese lift net, with or without wings, operated from two boats and set against the current. May be operated in the day but at night, additional boats with lights are used to attract fish. Also called eight-angle net. See also three-boat, four-boat and eight-boat lift nets.

two boat pelagic trawl = a wingless, midwater trawl with a square mouth towed between two boats. Also called Larsen midwater trawl, Larsen trawl, floating trawl, Larsen two boat trawl, atom trawl.

two boat purse seining = purse seining with two boats using very large nets (2.5 km long, 183 m deep, weight 10 tonnes).

two boat trawling = pair trawling (bottom or mid-water trawling by two vessels towing the same net. Very large nets can be towed in this manner by relatively small boats and the net is generally hauled alternately aboard the two vessels for processing of the catch. The net mouth is kept open by the outward pull of the two vessels).

two walled net = an entangling net with one panel of wider mesh than the other so the fish pass through the wider mesh but trap themselves in the bag formed by the smaller mesh after the fish bump into it.

two-boat lift net = two boat lift net.

two-eyed beefsteak = a herring (slang).

two-stemmed boat = a small fishing boat with a stern shaped like the prow (Newfoundland).

two-storey fish community = the relationship between warm-water species in upper layers and cool-water species in deeper, colder waters.

ty = abbreviation for a thousand years.

tyauven skate = a dish of dried skate filaments (Scottish dialect).

tyee = a chinook salmon over 30 pounds weight.

tyer = a length of cord tied around a cod trap to keep it from getting tangled when moved to or from a boat (Newfoundland).

tympanic head spine = a spine on the head of Scorpaenidae members. They are, from anterior to posterior over the top of the head on each side, the nasal, preocular, supraocular, postocular, tympanic, coronal (medial to the tympanic and postocular spines), parietal, and nuchal. Opercular spines are at the postero-dorsal corner of the operculum, preopercular spines line the posterior margin of the preoperculum, and the cleithral and postcleithral spines are just above the opercular spines on the side of the head.

tympanum = an area of enlarged scales behind the gill opening in some members of the Balistidae. This area can be vibrated to produce sound.

*typ.* = abbreviation for *typus* meaning type.

*typ. cons.* = abbreviation for *typus conservandus*.

type = the standard of reference for determining the precise application of a zoological name; a term used alone, or forming part of a compound term, to denote a particular kind of specimen or taxon; nomenclatural type; nomenifer; onomatophore. Each taxon has, actually or potentially, a type. The type of a nominal species is a specimen (type specimen), the type of a nominal genus is the nominal species (type species), and the type of a nominal family is the nominal genus (type genus).

-type (suffix) = image, type.

type collection = a collection of type specimens; often separate from the main collection and having additional safeguards and maintenance schedules.

type designation = determination of the type of a taxon (type selection).

type fixation = fixation (in taxonomy, a general term for the determination of species, whether by designation (original or subsequent), or by indication, *q.v.* fixation by elimination is the supposed fixation of a type species by the subsequent transfer of all but one of the originally included nominal species from a genus, not in itself an available method of type fixation).

type horizon = the stratum from which the type species of a fossil was collected.

type host = the host species with which the name-bearing type was associated.

type locality = the geographical place of origin of the type-specimens of a species-group taxon. The population occurring at type locality is the topotypical population and specimens collected at type locality are topotypes.

type material = a collective term for all type specimens. Zoologists should ensure that such material is transferred as quickly as possible to public institutions where their safety is guaranteed and they are accessible to other workers.

type selection = type designation.

type-genus = the nominal genus that is the type of a taxon in the family-group.

type-series = the type-series of a species consists of all the specimens on which its author bases the species, any that he refers to as variants, or doubtfully associates with the nominal species, or expressly excludes from it.

type-species = the nominal species that is the type of a taxon in the genus-group. Although many species may be included in a genus, a generic taxon is based on a single type species.

type-specimen = the single specimen (holotype, lectotype, or neotype) that is the type of a taxon in the species-group. May also be used for any specimen of the type series.

type-subspecies = the original populations described as a new species are also the type subspecies and bear the species name as the subspecies name also, e.g. *Sarda chiliensis lineolata* is the subspecies of Pacific bonito found in Canadian waters; the species (and therefore the type subspecies, *Sarda chiliensis chilensis*) was described from off South America. A subspecies distinct from the original species requires a new, subspecific name, the third latinised word in a scientific name.

typescript = a typed document as opposed to one handwritten; now somewhat obsolete with the use of computers.

typhlosole = a spirally coiled fold of the intestinal wall; in jawed fishes it can be developed into a spiral valve.

typical = said of a structure or character that is the most usual in a group.

typical host = the fish in which the parasite or pathogen is most commonly found in nature.

Typification, Principle of = Principle of Typification (the principle that each nominal taxon in the family group, genus group or species group has, actually or potentially, a name-bearing type fixed to provide the objective standard of reference by which the application of the name is determined).

typographical error = a printer's error, an incorrect spelling made in type-setting. This may have significance in nomenclature.

typology = 1) the use of types in nomenclature to fix the application of scientific names.

typology = 2) an idealised or generalised pattern shared by all members of a group.

typological species = a species defined on the characters of the type specimen; nomenspecies.

typonym = 1) in nomenclature, the type of a name.

typonym = 2) an objective synonym, *q.v.*, a later name given to a type specimen.

typonym = 3) an obsolete term for a name based on an indication of a type species or type specimen.

typonym = 4) a trivial name used in designation of the type species of a generic name, e.g. *typus*, *typicus*.

typonymous homonym = a typonym, *q.v.*, that is also a homonym.

typotype = said of the specimen from which an illustration or description that constitutes a type is prepared; the type of a type.

*typus* = type. Abbreviated as *typ.*

*typus conservandus* = a type to be conserved. Abbreviated as *typ. cons..*

tyrranotype = a joke name in nomenclature for a type designated by the International Commission on Zoological Nomenclature.

## U

ubiquitous = having a worldwide distribution, common to abundant in a given area.

UDN = ulcerative dermal necrosis ( a disease affecting salmonids returning from the sea to fresh water with head lesions. The cause is probably viral but the lesions are typically infected by bacteria and fungi).

ugg = the pectoral fin of a fish and its adjacent parts (Caithness dialect). Also spelled ugg.

ugg = ug.

ugg bone = the bone(s) behind the gills of a fish (the pectoral complex), the main bone being the cleithrum) (Scottish dialect).

ukha = a clear Russian soup made with fish, vegetables and spices. The fishes can include salmon, cod, perch, tench, burbot and European catfish.

ulcer disease = a subacute to chronic systemic bacterial disease of salmonids caused by *Hemophilus piscium*.

ulcerative dermal necrosis = a disease affecting salmonids returning from the sea to fresh water with head lesions. The cause is probably viral but the lesions are typically infected by bacteria and fungi. Abbreviated as UDN.

ulcerative disease of goldfish = furunculosis (a systemic bacterial disease (*Aeromonas salmonicida*) generally of salmonids but also found in some flatfishes such as turbot

(*Scophthalmus maximus*) and in goldfish. Usually occurs in young fish following stress and in spring when temperatures rise and is characterised by loss of appetite as the intestine is inflamed. Septicaemia and haemorrhages in the muscles and other areas occurs. Furuncles (boil-like lesions) develop in body tissues).

ultimate = last or farthest, e.g. ultimate ray.

ultimate lifeform = ray-finned fishes (Actinopterygii) (Morrison, 2007).

ultimate vertebra = terminal vertebrae (the last complete centrum of the vertebral column; not homologous across taxa because of varying fusions of preural and ural centra and so of little utility).

ultimobranchial gland = a paired endocrine gland producing calciton which helps regulate the calcium level by lowering it. Located between the ventral wall of the oesophagus and the sinus venosus. See also corpuscles of Stannius.

ultra- (prefix) = beyond.

ultra-abyssal zone = hadal zone, *q.v.*

ultra-light = a very flexible, thin fishing rod used with light lines (2-6 lbs) and small lures. Used for crappie and trout.

ultrahaline = sea water with a salinity greater than 30 parts per thousand.

ultraoligotrophic = an aquatic ecosystem having an extremely low nutrient supply and productivity.

ultraviolet steriliser = an aquarium device that sterilises water by passing it through a glass tube around an ultraviolet light. Useful in removing bacteria, algal spores and parasites.

umbrella net = a lift net, *q.v.*, in the shape of an umbrella.

umbrella species = a species whose protection will also protect a wide range of co-existing species in the same habitat, which may be lesser known and difficult to protect otherwise.

unadon = literally "eel bowl" in Japanese, a rice dish with grilled eel coated in a sweet sauce.

unagi maki = eel roll as served in a sushi restaurant.

unagi no kimo = eel innards as served in a sushi restaurant.

unassigned = said of a taxon which is not classified in a higher taxonomic category, e.g. a family not placed in an order.

unavailable = used of a name, nomenclatural act or work that does not comply with the provisions of the International Code of Zoological Nomenclature, or that has been annulled by the Code.

unavailable name = a name which does not meet all mandatory provisions of the International Code of Zoological Nomenclature. Has no status in nomenclature. Unavailable names include *nomen oblitum*, *nomen negatum*, *nomen nudum*, *nomen nullum*, *nomen vetitum* (all q.v.).

unavailable nomenclatural act = one published in an unavailable work.

unavailable work = a work published prior to the starting point of the group, or one that does not conform to the provisions of the International Code of Zoological Nomenclature or that has been annulled by the Code.

unblocked quota = fishing shares that can be subdivided when transferred, although there are limits on the number of these shares that an individual may own.

unbusked = an undressed hook in fly fishing.

uncertainty = the difficulty in obtaining complete and accurate knowledge of all the factors affecting a stock assessment, in compiling biological data and in the management of a fishery. Uncertainties include measurement errors, natural population variability, e.g. in recruitment, error in use of models, estimation errors, and management implementation errors.

uncinate = hooked at the tip.

unculi = plural of unculus.

unculus (plural unculi) = a horny projection arising from a single cell of the epidermis, unlike the multicellular, horny breeding tubercles; found in Chanidae, Cyprinidae, Balitoridae, Sisoridae, e.g. on the disc of *Garra* and over much of the body surface in some Sisoridae. Function is possibly adhesive, protection of the skin, rasping and hydrodynamic.

unculiferous = bearing uncili.

under-gravel filter = an aquarium filter providing both mechanical and biological filtration. It consists of a perforated plate placed on the bottom of the aquarium and then covered in gravel. Water is pulled through the gravel, under the plate, and up through lift tubes.

under-reporting = failing to fully report all the fish caught and landed.

under-running = the process of hauling in a net over the bow of the boat and, e.g. with a longline, removing fish, and re-baiting and re-setting the line. When this was done by fishermen from a dory, a 1.5 km line was set, with a fish caught every tenth to fifteenth hook, and the line was pulled and set three or four times a day.

under-running stick = a piece of wood that kept the line and hooks from snagging the dory when under-running.

undercut = said of river banks where erosion leaves a section of bank overhanging the water. Some undercut banks are fairly stable when held together by vegetation (roots) and provide a sheltered habitat for fish, others collapse and may silt up spawning sites.

underfished = a stock which could sustain catches higher than current ones; there is high survival of juveniles and moderate to severe competition for resources among adults.

undergravel filter = a form of aquarium filter consisting of a perforated plate placed under the gravel on the bottom of the aquarium. The plate has several uplift tubes terminating at or near the water surface. The substrate acts as the filter bed as water is drawn down through it, into the plate and up the tubes. A reverse flow system also works where the water rises through the substrate. The filter bed should be 6.0-7.5 cm deep and the grain size should be 4-5 mm for efficient filtering.

undershot = underslung.

undersized = fish caught at a size smaller than the minimum size limit established by regulation.

underslung = subterminal mouth or jaw.

understocking = a pond stocked with a number of fish less than its capacity.

underutilised = a species or stock that has potential for a large additional harvest.

underwater farming = aquaculture (the artificial or controlled culture of aquatic organisms, including stripping and fertilisation of eggs and raising of young to a certain size for release or marketing).

underyearling = a fish less than one year of age.

undetermined = said of a species or specimen that has not been identified.

undeveloped = a fishery in its very early stage of development, with very low levels of fishing effort, producing much lower quantities of fish than its potential maximum yield.

undressed jig = a bare jig hook with a molded lead head used with live bait.

undulate = having a wavy margin.

undulating = moving in waves, e.g. fish swimming; movement of the female fish's in a waving motion used to move gravel for the construction of a redd.

undulatory swimming = muscular undulations passing along the body, generating forward movement. See also oscillatory swimming.

unessential type = an obsolete term in nomenclature for a specimen, figured or cited to which reference is made in a published work, but which adds nothing to the knowledge of the characters of the species. Also called onomatype.

unfed fry = fry from the time the yolk-sac is absorbed until it starts feeding.

unfishable = said of waters that cannot be fished, whether commercially or for sport, because of the existing conditions (weather, rocks, weeds, etc.).

unfished = a fish or population of fishes not fished for.

unfished ground = an area where fish catches are not carried out.

unfishalee = not suited to fishing (Scottish dialect).

ungutted = fish prepared for sale as food without the guts removed.

unhooking mat = a thick, soft, sometimes inflatable mat, wetted with water, and used by anglers to place a fish on while unhooking it. Such a mat preserves the mucus covering of the fish and allows it to be returned alive to the water with a better chance of survival.

uni- (prefix) = one, single.

uni knot = a knot used by anglers to connect hooks, swivels, rings and lures. Various websites have animated steps showing how to tie this knot. Also called Duncan loop.

uni-to-uni knot = a knot used in angling to tie two pieces of line together. Useful in tying monofilament to braided line as the latter tends to cut the former. Various websites have animated steps showing how to tie this knot.

unicanulate = having a single canal or groove.

unicuspid = with a single point cusp, e.g. unicuspid tooth.

uniformitarianism = the present is the key to the past. The physical and biological factors which link today's variations must have been in operation in the past. Also called Principle of Continuity.

uninomen (plural uninomina) = a scientific name consisting of a single word, used for higher taxa above the rank of species group.

uninomial = used incorrectly for uninominal (actually a mathematical term).

uninomina = plural of uninomen.

uninominal = the adjective for uninomen.

uniserial = arranged in a single row or series.

unisexual fish = one-sexed; an all-female "species". These fishes are of interspecific hybrid origin, have clonal inheritance and often include polyploids, e.g. *Poecilia formosa*. See also biotype, bisexual, gynogenesis, hybridogenesis, parthenogenesis.

unit = a fishing unit is the gear, processes and people that together can fish autonomously.

unit stock = a population of fish, either of one or a number of species, grouped together for assessment purposes which may or may not include all the fish in a stock. The fish occupy a particular area and live independently of other populations of the species; an arbitrary grouping

of populations large enough to be self-reproducing and showing similar patterns of growth, migration and dispersal.

unitary designation = an obsolete term for a single word used as the name of a species in some eighteenth century works. This is non-binominal nomenclature and the word is sometimes mistaken for a generic name.

unite = in taxonomy, to combine or join two or more taxa.

Universal Transverse Mercator = a system for indicating locations on the Earth's surface based on ground distances. Locations are designated in terms of distances in metres east of the centre of a UTM zone and north (or south) of the equator. The earth is divided into sixty zones, each 6 degrees of longitude wide. Each zone is projected onto a Transverse Mercator projection. UTM zone 1 extends from 180° to 174°W. Each zone extends from 80°S latitude to 84°N. Abbreviated as UTM.

universal trawl = multipurpose trawl, one that can be used for midwater and bottom trawling.

univoltine = one generation per year or season.

unjustified emendation = any emendation other than a justified emendation (the emended name is treated as a new name with its own authority and date).

unjustified original spelling = the spelling of a family-group name based upon an unjustified emendation of a generic name.

unknown stock = stocks where there is insufficient information to identify stock origin or stock status with confidence.

unmade = split and salted cod, but not dried (Newfoundland).

unnecessary substitute name = a replacement name (*q.v.*) introduced when no such name was required.

unofficial term = a term in taxonomy and nomenclature not regulated by the International Code of Zoological Nomenclature.

unpublished name = a type to be conserved; any name which has not been printed and circulated to meet the criteria of publication as stated by the International Code of Zoological Nomenclature.

unpublished work = a work that is not published or one that the International Commission on Zoological Nomenclature has ruled to be treated as unpublished.

unregulated fishery = a fishery in which producers and others involved are not subjected to any regulations.

unscheduled record = a museum record for which final deposition has not been determined.

unsegmented ray = a soft ray, usually small, without segments and found at the beginning of a fin.

unspawned = any mature fish that has not spawned.

unused name = an available senior synonym that is not known to have been used as a valid name in the past 50 years.

uo-miso = a fermented fish paste, made from boiled, dried white meat of cod and kneaded, mixed with soybean paste (miso), sugar, sweet rice liquor and starch. Often sold canned (Japan).

upland = hilly terrain with a stream type of moderate gradient and with runs and riffles 10-50% of the length.

upland catchment water = water from land above about 100-200 m; often unpolluted as higher reaches of river basins are remote from cities.

upmouth = 1) a fishing device on the River Wye in Herefordshire recorded in 15th century manorial records. Probably a basket eel trap with the opening facing upstream to catch adult eels as they migrate towards the sea in late August to early October.

upmouth = 2) a superior mouth; sometimes used in fish names, e.g. upmouth hugo, *Hygophum taanigi*, a myctophid.

upper jaw length = the distance from the anterior tip of the upper jaw to the posterior tip of the upper jaw. Sometimes miscalled maxillary length when the premaxilla enters into the upper jaw.

upper limb = the upper part of a gill arch above the bend.

upper pond = the head pond in a series of linked ponds, thus the first supplied with water.

upper reach = trout zone (an area of river with fast currents, a stony bottom, and a fish fauna having cylindrical bodies).

upper river = upper reach.

upper-level consumer = a fish that eats predatory animals; often a piscivore in fishes.

uprush = run-up (the rush of water up a structure such as a beach on the breaking of a wave. Also called swash).

upside down goldfish = *Carassius auratus* with a swimbladder or intestinal infection, once valued in China as the shui yu or sleeper goldfish.

upstream = toward the source or upper part of a stream or current; against the current.

upward cast = a fly fishing cast above eye level used for distance.

upwelling = 1) an upward movement of cold, nutrient-rich water from the ocean depths, often associated with great production of fish and fisheries. For fisheries, the most important types are wind-induced coastal upwelling where the upward movement is a consequence of wind stress (along shore) and Eckman transport (offshore). ural centrum = the central body of the vertebrae which carry hypurals, after the bifurcation of the caudal artery.

upwelling = 2) a groundwater upwelling, an underwater spring that arises in lake and stream beds, often used by trout for spawning.

ural vertebra = one of the vertebrae to which hypural bones are attached.

urban fishing = angling near a highway bridge or other non-natural structure.

urceolate = shaped like an urn.

urea =  $(CH_2)_2CO$ , a waste product of metabolism excreted via the kidneys but also found in Elasmobranchii blood to maintain osmotic balance. It is degraded to ammonia by enzymes leading to a characteristic pungent odour in spoiled Elasmobranchii.

uremic = of or involving excess nitrogenous waste products in the urine, e.g. the embryo in Chondrichthyes is four to five times as uremic as the parent since the egg shell is permeable to urea.

ureotelic = producing urea as the main nitrogenous waste, as in fish.

urinary bladder = a small vesicle at the posteriormost, ventral part of the body cavity. In females the bladder is combined with the oviducts to form a urogenital sinus.

urinary calcinosis = urolithiasis.

urinary papilla = the external projection of the male urinary bladder.

urinary pore = the point of exit of wastes from the male urinary papilla.

uriniparous tubule = a urine-producing tubule of the kidney (as compared with the special mucoparous tubules of Gasterosteidae).

urli = a conical-shaped, bamboo fish trap used in rivers to catch fry and fingerlings of mahseer (Cyprinidae) in India.

urodermal = paired, thin dermal bones at the rear of the caudal fin skeleton, derived from scales.

urogenital papilla = genital papilla (a small fleshy projection behind the anus, through which the genital and sometimes urogenital system communicates with the exterior).

urogenital pore = the point of exit of wastes from the female.

urogenital region = the area of the abdomen near the urinary and genital openings.

urogenital sinus = the bladder combined with the oviducts in females.

urohyal = a flat, median, deep, endochondral bone below the ceratohyal; a tendon bone arising in the septum between the longitudinal muscles of the isthmus. Absent in such primitive fishes as *Lepisosteus*. Also called clidost, episternal, interclavicle and parahyoid.

urolithiasis = the formation of calculi in the urinary ducts.

uroneural = one of the paired, elongate, endochondral bones projecting from the lateral surfaces of the urostyle.

urophore = the caudal skeleton. It is formed from various bones of cartilaginous or dermal origins.

urophysis = a neurosecretory organ at the ventral side of the distal end of the spinal cord, composed of unmyelinated axons ending on the capillary wall. Function unknown.

uropterygia = plural of uropterygium.

uropterygium (plural uropterygia) = caudal fin (the tail fin, aiding movement. The fin at the posterior end of the vertebral column (but in Centriscidae the hind end of the body rotates so that the caudal fin is ventral, and in some Trachipteridae the upper lobe of the caudal may be dorsal (the separate lower lobe may disappear). In other families, such as the Zoarcidae and Anguillidae, dorsal, caudal and anal fins are united and are externally indistinguishable. Abbreviated as C).

urosome = the portion of the body posterior to the vent.

urostyle = 1) the small upturned posterior tip of the vertebral column, generally formed of a slender, pointed rod of cartilage, or fused vertebrae and associated elements (in homocercal caudal fins of Teleostomi).

urostyle = 2) the fan-like series of bones articulating with the last true vertebra, including preural centra, ural centra, epurals and hypurals. Counted as one vertebra in some vertebral counts, not counted in others.

urostyli = plural of urostylus.

urostylus (plural urostyli) = urostyle.

usable stock = the number or weight of all fish in a stock that lie within the range of sizes customarily considered usable or so designated by law (Ricker, 1975). Also called standing crop.

usage = the sense in which a name has been applied, correctly or not according to the International Code of Zoological Nomenclature.

usage, prevailing = that usage of the name which is adopted by at least a substantial majority of the most recent authors concerned with the relevant taxon, irrespective of how long ago their work was published.

use rights = rights for the use of resources that can be defined by local custom, mutual agreements, or prescribed by other entities holding access rights. These rights may restrict the use of particular resources to specific levels of consumption or particular harvesting techniques.

user = a commercial, recreational or indigenous fisher, a fish watcher or scuba diver, or any member of a community with interests in fishes, presumably including ichthyologists.

user group = a group of individuals that utilise a resource in a specific manner.

user participation = resource users playing an active role in the process of fisheries management.

ussel = the short cords in a herring net that attach it to the balk (Northumberland dialect).

utaka = a group of haplochromine Cichlidae in Lake Malawi. This cluster of species feeds in open water, and the individuals are usually elongate and silvery.

uterine cannibalism = the condition in some sharks where the embryos feed on eggs and smaller siblings inside the mother.

uterine milk = histotrophe (or ovarian milk, a secretion produced by teleost livebearers for absorptive feeding during fish ontogeny).

uterus = the organ where fertilised eggs develop. A true uterus is not present in fishes but the term may be used for the egg capsule in Chondrichthyes.

uthy = oothy (a smooth surface made on the sea by throwing out crushed limpets or mussels as inshore bait for coalfish (*Pollachius*, *Gadidae*) (Orkney dialect)).

utilised population = utilised stock.

utilised stock = the part, by number, of the fish alive at a given time, which will be caught in the future (Ricker, 1975). Abbreviated as V.

utmost fish = a Churchillian directive in World War II meant to promote fishing in light of a perceived shortage of this food.

utricle = utriculus.

utriculi = plural of utriculus.

utriculith = lapillus (plural lapilli)(the otolith in the utriculus. It is held in a vertical position against the cells of the utricular macula which is innervated by the anterior branch of cranial nerve VIII (the stato-acoustic nerve). Movements of the lapillus send signals to the brain and help the fish to maintain equilibrium. It is usually very small but is the largest otolith in Siluridae).

utriculus (plural utriculi) = the uppermost sac of the inner ear into which the semicircular canals enter. Contains the lapillus or utriculith otolith, usually the smallest, in Teleostei and minute

particles of calcium carbonate called otoconia in endolymph in Elasmobranchii. Also called utricle.

utsuri = ornamental carp or koi (*q.v.*), being black koi with a single coloured marking.

uvula = the lobate extension of the inner crown base of a chondrichthyan tooth (Herman *et al.*, 1994).

## V

V = 1) abbreviation for ventral (pelvic) fins.

V = 2) abbreviation for vulnerable in the IUCN Categories, *q.v.*

V = 3) abbreviation for utilised stock (the part, by number, of the fish alive at a given time, which will be caught in the future (Ricker, 1975)).

v = 1) abbreviation for *vide*, meaning see.

v = 2) abbreviation for *visum*, meaning seen.

v = 3) abbreviation of volume.

v = 4) abbreviation of *varietas*, meaning variety.

v = 5) abbreviation of *vel*, meaning or.

v = 6) versus, in contrast to. Also as vs.

v. et. = abbreviation for *vide etiam*, meaning see also.

v-cut = an acute, v-shaped cut containing the pin bones (*q.v.*). The cut is made through a skinned fillet along both sides of the line of the pin bones from the neck towards the tail such that both cuts meet just behind the position of the last pin bone.

vaam = said of a fisherman who catches no fish (Shetland Isles dialect). Also spelled vam, vamm and vaum.

vaarnakle = varnangle.

vaav (noun) = 1) a woollen thread used to tie a bait to an old-fashioned wooden hook or pin (Shetland Isles dialect). Also spelled vav. See also varnangle.

vaav (verb) = 2) to fasten a soft bait on a hook by tying a thread round both (Shetland Isles dialect). Also spelled vav.

vadal = floating close to shore.

vadose = of, relating to, or being water or solutions in the earth's crust above the permanent groundwater level.

vagal lobe = an enlargement in the dorsal medulla oblongata associated with connections of the vagus nerve and, in some species, the glossopharyngeal nerve.

vagile = freely motile; wandering; mobile.

vagility = the tendency of an organism or population to change its distribution with time; the ability to move from place to place.

vagrant = a species that has strayed beyond its natural range but not established reproducing populations.

vagus nerve = the Xth cranial nerve, sensory to pharynx, oesophagus, thoracic and abdominal viscera. innervates pharyngeal musculature, visceral musculature, trunk lateral line, visceral arches behind third, respiratory movement. See cranial nerves.

vain name = *nomen vanum*.

vaity-kabe = an upright piece of wood fitted on the gunwale of a boat with a tip notch to enable fishing line to run freely (Shetland Isles dialect). See also waith horn.

valiculture = seasonal confinement in natural lagoons as a means of fishery management.

valid = used of an available name or nomenclatural act that is acceptable according to the International Code of Zoological Nomenclature and in the case of name, one which is the correct name of a taxon in an author's taxonomic judgment.

valid name = the correct name for a taxon: a taxon may have several available names, but only one of those names (most frequently the oldest) is the valid name. The valid name is always an available name (*q.v.*) (the reverse is not always true). An invalid name may be either an available or unavailable name.

valid nomenclatural act = one that is accepted by under the provisions of the International Code of Zoological Nomenclature, i.e. the earliest available nomenclatural act relevant to a particular name or nominal taxa\on which does not contravene any provisions of the Code.

valid species = a species that has an existence in the real world and is recognised as such. In opposition to a species thought to be distinct but which does not actually exist, is no longer recognised, or is treated as a synonym.

validated name = a formerly invalid or unavailable name that has been made valid or available by the International Code of Zoological Nomenclature, e.g. by annulment or suppression of senior homonyms or synonyms.

validation = 1) to make valid or available a formerly invalid or unavailable name or invalid nomenclatural act.

validation = 2) confirming the accuracy of ageing methods that use skeletal structures like otolith zones by showing that the zones do refer to age.

valliculture = fish culture in brackish water bodies (valli) based on seasonal migrations in Italy. The valli have a fish weir that separates them from the sea; eels and mullets are common species.

valve, buccal = oral valve (the flap attached just inside the jaws which stop water escaping from the mouth during exhalation, helping to maintain a unidirectional flow. Usually a valve is found just inside the ring of teeth in the jaw).

valve, oral = oral valve; valve, buccal.

valvula (plural valvulae) = a small valve.

valvula (plural valvulae) = any structure preventing a backflow. See valve, buccal.

valvula Bauhini = a ring-shaped structure between the mid-gut and the hind-gut of some fishes; others have none.

valvula cerebelli = a continuation of the base of the cerebellum projecting anteriorly into the area of the posterior floor between the two optic ventricles. Fish with a large valvula cerebelli have a better developed lateral line system.

valvulae = plural of valvula.

vam = vaam.

vamm = vaam.

vam'd = voamd.

van gogh = a gene name for a zebrafish mutation affecting the ear (abnormal ear morphology). See also einstein, half stoned, what's up, rolling stones, among many others.

vanity aquarium = an aquarium containing only those species discovered and described as new by the owner.

var. = abbreviation for variety.

variable spelling = variant spelling.

variant = any individual or group that deviates from the typical behaviour or anatomy.

variant spelling = different spellings of specific or subspecific names that are deemed to be identical for the purposes of the Principle of Homonymy.

variation = divergence in structure or function not attributable to age, sex or life history stage.

variegated = an irregular pattern of small, dark and pale markings and many dark marks connected.

*varietas* = variety. Abbreviated as v.

variety = an ambiguous term of classical taxonomy for a heterogeneous group of phenomena including non-genetic variations of the phenotype, morphs, domestic breeds, and geographic races. Before 1961, according to the International Code of Zoological Nomenclature, use of the term "variety" is not to be interpreted as an express statement of either subspecific or infrasubspecific rank and after 1960, a new name published as that of a "variety" is to be regarded as of infrasubspecific rank.

varnangle = a wooden pin used as a hook, lodging cross-wise in the mouth of a fish (Shetland Isles dialect). Also spelled vaarnakle.

vas deferens = a paired structure of the testes carrying sperm when joined as a genital sinus to the exterior between the urinary papilla and the anus.

vasodentine = dentine with branching blood vessels but lacking dentinal tubules, e.g. teeth of *Merluccius*.

vasp speyr = waster (a fish spear or leister used especially on salmon (Scotland). Also called wester, wasper, waspeir, wausper, wawsper, vauch spear and wasp speir).

vate = a large, box-like trough in which cod livers were placed to render oil (Newfoundland). See also vate and fat.

vate = vat.

vauch = a bank or mound of stones set up in a river as a salmon trap (Scottish dialect).

vauch net = a salmon net used at a vauch, q.v.

vauch spear = waster (a fish spear or leister used especially on salmon (Scotland). Also called wester, wasper, waspeir, wausper, wawsper, wasp speir and vasp speyr).

vaum = vaam.

vav = vaav (1 and 2).

VAV = a ventro-lateral row of photophores running from the pelvic fin insertion to the anal fin origin.

VD link = backstrop link (a triangular steel link with rounded corners on the back of a trawl's otter board. The backstrop is attached here. Also called board link, door sling ring and shearboard link).

VD trawl = Vigneron-Dahl trawl (the usual rig of an otter trawl with long cables that frighten fish toward the net).

vector = an organism which carries or transmits a pathogen. Introductions of fishes to new water bodies may make a fish a vector.

vee = one of the two v-shaped corners of a cod trap next to the door or entrance (Newfoundland). See also back-end vee.

vegaquarian = vegequarian.

vegetal colouration = a general resemblance to vegetation shown by fish concealing themselves from predators or prey.

vegetal pole = opposite to the animal pole on the egg. Later in embryonic development corresponds to the point on the yolk cell furthest from the developing blastodisc.

vegetative fish cover = any live (e.g. algal mats, reed beds, lily pads) or dead (e.g. logs, branches) plant materials that provide cover for fish of varying ages.

vegequarian = a vegetarian who eats fish.

veil = a large mucous sheet, the egg membrane of *Lophius*, based on its shape.

*vel* = or. Abbreviated as v.

velar tentacles = short bristled barbels or tentacles which radiate inwards about the mouth from the velum in Amphiox. Prevent undesirable objects from entering the digestive cavity. Also present in Petromyzontidae at the junction of the pharynx and oesophagus.

velocity = the speed of water flowing in a watercourse.

velocity barrier = a physical structure, such as a barrier dam or floating weir, built in the tailrace of a hydroelectric powerhouse, which blocks the tailrace from further fish migration to prevent physical injury or migration delay.

velterin = a half-grown cod (Shetland Isles dialect).

velum = 1) a membrane, veil, covering, curtain.

velum = 2) a vertical membrane surrounding the mouth from which the velar tentacles erupt in Amphiox.

velum = 3) the membrane guarding the opening of the blind pharynx in Petromyzontiformes from which spring the velar tentacles.

velvet disease = gold dust disease (an infectious disease caused by dinoflagellates evidenced by a golden or brownish dusty appearance on the fish skin through mucus production. The fish may show irritability, flashing, respiration difficulties and clamping of the fins. A very contagious and often fatal disease in aquaria. Called velvet disease when *Oodinium* (or *Piscinoodinium*), coral fish disease when *Amyloodinium* and also rust from the appearance).

ven = fin of fish (Newfoundland).

Venice system = a means of classifying marine and brackish waters according to salinity: hyperhaline >40‰, euhaline 30-40‰, mixohaline 0.5-30‰, mixoeuhaline >30‰ but less than adjacent sea, (mixo-) polyhaline 18-30‰, (mixo-) mesohaline 5-18‰, (mixo-) oligohaline 0.5-5‰, and limnetic (freshwater) <0.5‰. There are various modifications of this system, and a whole series of words, denoting various kinds of salinity or habitats, prefixed by haline, e.g. amphi-, anchia-, athalasso-, en-, eu-, eury-, holoeuryo-, hydro-, hyper-, infra-, iso-, meso-, mixo-, mixoeu-, mixomeso-, mixooligo-, mixopoly-, oligo-, poly-, polysteno-, steno-, thermo- and ultra-, all q.v.

venom = the poison secreted by the venom apparatus of an animal. Venoms are usually a large molecular protein or are in association with a protein which may serve as a carrier, but there may be many exceptions to this generalization.

venom apparatus = the traumagenic device (spine, tooth, etc.), venom gland, and accessory organs directly concerned with the introduction and transmission of a venom.

venomous fishes = those fishes that produce their poisons by means of glandular structures and are equipped with a spine or other traumagenic device to purvey their venoms. The poisons are parenteral toxins, usually large molecules, and are readily destroyed by heat or gastric juices. Also called ichthyacanthotoxic or acanthotoxic fishes.

venomous fishes, treatment of poisoning from = in all cases qualified medical attention should be sought immediately. The following suggestions give some basic assistance and indicate severity of poisoning and are taken from Halstead (1970):-

- 1) sting rays including Dasyatidae, Gymnuridae, Mobulidae, Myliobatidae, Potamotrygonidae, Rhinopteridae, and Urolophidae - irrigate wound with cold seawater, explore wound and remove all pieces of integumentary sheath, after thorough cleansing soak injured part in water as hot as can be borne without damage for 30-90 minutes. Magnesium sulphate may be added to the water as a mild anaesthetic. Following soaking the wound may be debrided, cleansed and closed with dermal sutures. Anti-tetanus agents are recommended, antibiotic agents may be required. Intramuscular or intravenous demerol has been found effective in controlling pain. Primary shock can be treated with the usual measures. Secondary shock from action of venom on the cardiovascular system may require immediate and vigorous therapy - maintaining cardiovascular tone and preventing complications. Elevation of the injured member is advisable. Do not use potassium permanganate, ammonia or cryotherapy. Stingrays can be avoided by shuffling one's feet along the bottom.
- 2) catfish stings including Ariidae, Bagridae, Clariidae, Doradidae, Heteropneustidae, Ictaluridae, Pimelodidae, Plotosidae, Siluridae - treatment is similar to that for stingray stings, see above.
- 3) weaverfish stings, Trachinidae - treatment is similar to that for stingray stings, see above. In addition calcium gluconate alleviates pain; procaine injections may be used for less severe cases; and intravenous meperidine helps relieve severe pain which continues beyond the first hour after injury.
- 4) scorpionfish stings, Scorpaenidae - punctures should be thoroughly cleansed to remove venom. Bleeding should be encouraged. Soak injured part in water as hot as can be borne without damage to the tissues for 30-90 minutes. Magnesium sulphate may be used in the water as a mild anaesthetic. Surgical closure of the wound is not usually required. Anti-tetanus

agents are recommended, antibiotic agents may be required. Intramuscular or intravenous demerol may or may not help control pain. Secondary shock from the venom may require vigorous therapy to maintain cardiovascular tone and avoid complications.

5) stonefish (*Synanceja*) stings - this envenomation is very dangerous. Prompt immersion in hot water is recommended. Injection of emetine hydrochloride into the wound has been found of value (0.5-1.0 ml of solution of 1 g of emetine hydrochloride per ml), apparently having an antagonistic action against the venom and relieving the pain. Injections of 0.1 to 0.5 ml of 5% potassium permanganate and congo red have also been recommended. 2 ml of the Australian anti-venom is recommended. Initially intramuscularly, but if the case is severe the intravenous route may be used. If symptoms persist another 2 ml may be used. This anti-venom has been used with encouraging results with *Scorpaena* stings and is recommended for serious types of scorpionfish stings that do not otherwise respond to treatment. Anti-venom is available from the Commonwealth Serum Laboratories, Melbourne, Australia

6) toadfish stings, Batrachoididae - treatment as for scorpionfish stings, see above.

7) rabbitfish, Siganidae, and surgeonfish, Acanthuridae, stings - treatment is similar to scorpionfish stings, see above.

venom pore = the opening of the poison gland behind the pectoral fin in certain Ictaluridae (*Noturus*).

vent = 1) the posterior opening of the intestine, gonads and kidney ducts in front of the anal fin.

vent = 2) geothermal vent (a vent of hot, mineral-rich water on the ocean floor, usually near spreading oceanic ridges or subduction zones, with an associated fauna including fishes).

venter = relating to the underside, the abdomen. See also ventrum.

venterohyal = ventral hypohyal, see hyoid arch.

ventrad = toward the underside; ventral to.

ventral = pertaining to the lower surface or abdomen, opposite to the back or dorsal side.

ventral adipose fin = a fin before the anal fin on the belly.

ventral aorta = artery from the heart (the bulbus arteriosus) to the aortic arches, *q.v.*

ventral disk = sucker formed by the pelvic fins.

ventral adipose fin = a fin before the anal fin on the belly.

ventral fin fold = the lower finfold.

ventral fin marsupium = the name applied to the brood-pouch in Solenostomidae. It is a pouch formed by the pelvic fins, provided with many long filaments, and found only in the female.

ventral fins = the paired fins other than the pectoral fins (placed right behind the gill slit); may be located behind, below or in front of the pectoral fins. Sometimes lacking. Also called pelvic fins.

ventral photophores = a row of light organs along the abdomen on either side of the midventral line between the ventral and anal fins in Myctophidae. Abbreviated VO.

ventral rib = one of the ribs surrounding and protecting the viscera and articulating with the parapophyses of the vertebrae. Also called pleural or pleuroperitoneal ribs.

ventral stripe = a series of melanophores just ventral to the myotomes.

ventrèche = the region of the abdomen of tunas where the muscles are divided into lamella separated by fatty inclusions (France). Only applied to *Thunnidae*.

ventresca = belly strips of albacore cooked in brine and packed with olive oil in barrels or cans (Italy), cf. tarantello from bluefin tuna.

ventricle = 1) a heart chamber collecting blood from the atrium and delivering it to the conus arteriosus and mediating the second, major component of the heart beat. The ventricle is a thick and muscular chamber with a small opening into the bulbus arteriosus.

ventricle = 2) a fluid-filled brain cavity, one of a series of expanded parts of the central canal, q.v. The two lobes of the telencephalon contain the two anteriormost ventricles, the diencephalon contains the third ventricle, an optic ventricle forms the interior of each of the mesencephalic lobes, and dorsal half of the myelencephalon contains the fourth ventricle.

ventriculo-bulbar valve = one of the valves at the junction of the ventricle and bulbus arteriosus in the heart, q.v.

ventrohyal = ventral hypohyal (the hypohyal is the one or two deep, endochondral bones in the hyoid arch between the ceratohyal and the glossohyal. Articulates dorsally with the ceratohyal and ventrally with the basihyal. *Lepisosteus* has only one while *Gadus* has two, the dorsal hypohyal or dorsohyal and the ventral hypohyal or ventrohyal).

ventrolateral = the region between the ventral and lateral surfaces; the lower side of the body.

ventronasal photophore = the light organ in front of the eye below the nostrils in Myctophidae. Abbreviated VN.

ventrum = the underside of the body, the belly. See also venter.

venture = adventure (a commercial fishing enterprise).

venturi filter = a protein skimmer, q.v., with a cylindrical body used to draw air through a rapid current of water.

venulose = full of venules or small veins; having a structure patterned like a group of small veins, e.g. used to describe an area of the flank behind the gill opening in *Thryssa mystax* (Engraulidae).

verandah net = a net designed to trap leaping fish with a vertical component as a barrier and a verandah or floating component (sometimes a trammel net) to catch the fish as they try to leap

over the barrier. The barrier can be set in a straight line or in an open circle shape, or may be set from two boats to encircle a school.

*vere* = the true.

vermicide = any chemical used to kill or expel intestinal worms. See also vermifuge.

vermiculation = a worm-like marking, e.g. one of a series of wavy markings on the back of such fishes as the brook trout, *Salvelinus fontinalis*.

vermiform = worm-shaped.

vermifuge = an agent that kills or expels intestinal worms. See also vermicide.

vermivore = a feeder on worms and worm-like animals.

vernacular name = the name of a taxon in any language other than the language of zoological nomenclature; vernacular names have no status in zoological nomenclature, except certain family-group names (which were later latinized and generally accepted by zoologists interested in the group). Also called popular name, common name. Some efforts have been made in ichthyology in North America to stabilise a single name for each species as scientific names are dynamic and can change as understanding or relationships change.

vernal = pertaining to spring.

vernal pond = a pond occurring for a short period in the spring.

vernal-autumnal pond = a pond containing water in the spring, drying up in the summer, and filling up with water in the autumn.

verosimiliter = probably. Abbreviated as verosim.

verrucate = having wart-like prominences.

verrucose = covered with small dermal warts or having a rough surface.

verrucous = verrucose.

versatile = capable of being turned either way.

verso = any even numbered page of a book, on the left. Opposite of recto.

versus = against, as opposed to, in contrast to. Abbreviated as v or or vs.

vertebra (plural vertebrae) = bony or cartilaginous elements surrounding the notochord or replacing it and often protecting the spinal cord and caudal vein. Vertebrae are composed of a centrum formed from two pleurocentra and two intercentra or parts of these elements, a neural arch formed by the interdorsal and basidorsal of each side, a neural spine fused to the neural arch, a haemal arch formed from the fusion of the interventral and basiventral, and a

haemal spine fused to the haemal arch. Petromyzontidae lack centra and have a persistent notochord. Elasmobranchii have a centrum with a notochord core surrounded by a ring of cartilage (chordacentrum) to which the neural and haemal arches (arcocentra) attach and an outer ring of cartilage (autocentrum) interrupted by the arches. The cartilage becomes calcified (cyclospondylous, *q.v.*, asterospondylous, *q.v.*, tectospondylous, *q.v.*).

vertebra amphicœlica (plural *vertebræ amphicœlicæ*) = amphicoelous vertebra (biconcave vertebrae, having both ends hollowed out, the condition in Elasmobranchii, *Amia* and most Teleostomi except *Lepisosteus* (also spelled amphicelous)).

*vertebræ amphicœlicæ* = plural of *vertebra amphicœlica*.

vertebra aspondyla (plural *vertebræ aspondylæ*) = aspondylous vertebra (a vertebra lacking a centrum although neural and haemal arches are well-developed, e.g. in Cyclostomata, Holocephali, Dipnoi, Acipenseridae).

*vertebræ aspondylæ* = plural of *vertebra aspondyla*.

vertebra asterospondyla (plural *vertebræ asterospondylæ*) = asterospondylous vertebra (a type of vertebra with radiating, star-like calcifications extending to the chordacentrum and autocentrum, e.g. in some Elasmobranchii).

*vertebræ asterospondylæ* = plural of *vertebra asterospondyla*.

vertebra cyclospondyla (plural *vertebræ cyclospondylæ*) = cyclospondylous vertebra (vertebra consisting of calcified rings around the notochord in Elasmobranchii and Holocephali. The calcification extends only to the chordacentrum or notochordal sheath, the arches are cartilaginous).

*vertebræ cyclospondylæ* = plural of *vertebra cyclospondyla*.

vertebra diplospondyla (plural *vertebræ diplospondylæ*) = diplospondylous vertebra (the double vertebrae formed when the anterior and posterior elements (sclerotomes) have not fused, e.g. caudal vertebrae of *Amia*. Two types of centra are present, a precentrum lacking neural and haemal arches and a postcentrum having these arches).

*vertebræ diplospondylæ* = plural of *vertebra diplospondyla*.

vertebra dissospondyla (plural *vertebræ dyssospondylæ*) = dysspondylous vertebra (vertebra in *Amia*, Lepisosteidae and Acipenseridae where the pleurocentrum, intercentrum, basidorsal, basiventral, interdorsal and interventral all ossify but remain independent in the embryonic and juvenile stages. Some elements fuse later and form vertebrae with two centra in the caudal region and typical vertebrae anteriorly).

*vertebræ dyssospondylæ* = plural of *vertebra dissospondyla*.

vertebra holospondyla (plural *vertebræ holospondylæ*) = holospondylous vertebra (a vertebra with a single-disk centrum, formed of a single bone with all elements (arches, spines) fused, e.g. *Dipterus*, *Scaumenacia* (Dipnoi), Teleostei).

vertebræ holospondylæ = plural of vertebra holospondyla.

vertebra opisthocœlica (plural vertebræ opisthocœlicæ) = opisthocelous vertebra (vertebral centra which are concave posteriorly and convex anteriorly. e.g. in Lepisosteidae).

vertebræ opisthocœlicæ = plural of vertebra opisthocœlica.

vertebra polyspondyla (plural vertebræ polyspondylæ) = polyspondyloous vertebra (vertebra showing polyspondyly, the notochord surrounded by many serially arranged calcified rays, in effect having several centra e.g. *Chimaera* has 5-9 centra, *Amia* has 2 in the caudal region).

vertebræ polyspondylæ = plural of vertebra polyspondyla.

vertebra præuralis (plural vertebræ præurales) = preural vertebra (one of a series of vertebrae preceding the ural vertebrae and distinguished by lacking hypurals. They precede the bifurcation of the caudal artery. Called PU<sub>1</sub>, PU<sub>2</sub>, etc counted anteriorly from the first ural vertebra).

vertebræ præurales = plural of vertebra præuralis.

vertebra tectospondyla (plural vertebræ tectospondylæ) = tectospondyloous vertebra (vertebral centra (and arches) with several concentric ossifications instead of just one, extending to the chordacentrum, arcocentrum and autocentrum. Found in skates and rays).

vertebræ tectospondylæ = plural of vertebra tectospondyla.

vertebra uralis (plural vertebræ urales) = ural vertebra (one of the vertebrae to which hypural bones are attached).

vertebræ urales = plural of vertebra uralis.

vertebrae = plural of vertebra.

vertebral column = the vertebrae from the skull to the caudal fin, protecting the spinal cord and haemal artery and forming an attachment for muscles used in swimming.

vertebral counts = usually all the vertebrae are counted. If sutures are present in the urostyle, the indicated elements are counted. When sutures are absent the urostyle (if present) is usually counted as one vertebra. Vertebral counts may be separated into abdominal (precaudal or prehaemal) and caudal (haemal) vertebrae. The first caudal vertebra has a definite haemal spine and is the first vertebra to enclose the caudal vein (although there may be complete haemal arches not enclosing the caudal vein). In some older works the vertebral count is given as a fraction, the abdominal vertebrae forming the numerator, the caudal the denominator. In Ostariophysi (Cypriniformes and Siluriformes) the vertebrae in the Weberian apparatus are included. Some authors also count prethoracic vertebrae separately.

vertex = top of the head; highest point of the skull.

vertical blood vessel = last vertical blood vessel (the most posterior blood vessel extending from the dorsal aorta to the nephros and used as a reference point in anguilliform larval descriptions).

vertical classification = grouping of ancestral and descendant stages of a phyletic line into a single taxon. Compare horizontal classification, *q.v.*

vertical distribution = upward and downward dispersion, location or arrangement as of fish in a water column.

vertical fins = the dorsal, caudal and anal fins (as opposed to the paired fins). Also called median fins.

vertical incubator = a larval incubator unit which allows water to flow upward so that high densities of eggs and larvae with any nutrients can be raised in a small space. There is usually some form of filtration at the base to absorb incoming suspended particles.

vertical integration = an aquaculture facility or a fishery that has wide control over all aspects of the process that grows or catches fishes and delivers them to consumers.

vertical jigging = in angling, lowering a lure to the bottom and then lifting it and allowing it to fall again, varying the depth until fish are located.

vertical migration = the upward and downward movement of fish in a lake or the ocean. Movement is usually into surface waters at night to feed and into deeper waters to avoid predators during the day.

vertical mixing = circulation of water from the surface to the depths in a lake and vice versa occurring naturally in temperate lakes in spring and autumn.

vertical scale disease = dropsy (a swelling of the fish's body usually caused by bacterial infection, and also by viral infection, osmoregulatory problems, a flagellate protozoan (*Hexamita*), aggravated by poor environmental conditions. Serous fluid accumulates in any body cavity. Other symptoms are lethargy, gasping, increased respiration, colour loss, skin ulceration and exophthalmia. Also called pinecone disease (and vertical scale disease) because the scales stick out, and ascites).

vertical slot fish passage = this fishway is similar to a pool-and-weir ladder except that each dam has a narrow slot in it near the channel wall. The channel allows fish to swim upstream without having to leap over the dam wall. This type of passage handles seasonal fluctuation in water levels quite well. See also DeNiell fishway, pool-and-weir ladder and rock-ramp fishway.

vertical transmission = disease spread from parent to offspring via gametes or embryos, *cf.* horizontal transmission.

very high output light = an aquarium fluorescent light giving a higher intensity light than normal bulbs. Used for reef systems which require strong light.

vesica piscis = 1) fish bladder (a figure composed of two equal and symmetrically placed circular arcs).

vesica piscis = 2) literally "vessel of the fish", the Christian symbol, a stylised fish. Of pre-Christian origin since it is formed from the intersection of two circles as noted above, a pythagorean symbol of the intersection of the world of the divine with the world of matter. The length-height ratio of the vesica piscis, as expressed by Pythagoras is 153:265, a mystical number known as "the measure of the fish". In the Gospel of John, where Jesus helps his disciples to catch fish, Jesus catches exactly 153 fish. This biblical story is thought to be a coded reference to the vesica piscis. Also associated with the goddess Venus.

vesica piscis = 3) an ovoidal frame much used in the 12th century, especially in painted windows, to surround pictures of the Virgin Mary and Jesus Christ. It is meant to represent a fish, from the anagram ICHTHUS.

vesicula seminalis = seminal vesicles (the enlarged lower end of the genital duct which is secretory in nature and completes the formation of the spermatophores and stores them. The so-called "seminal vesicles" of teleosts (Blennioidea, Gobioidea) are misnamed and do not store sperm. Siluriformes have seminal vesicles).

vesiculate = thin and bladder-like.

vespertine = of or relating to the evening; active or spawning in the evening.

vessel = a boat, ship or other craft that is equipped and used for fishing or in support of such activity with a capacity of 5 net tons or more. Also used for any object with room for one or more persons and as such would include everything from a canoe to a ship.

vessel catch limit = a limit on the quantity each individual vessel can land per trip or short period of time such as a day or week.

vessel class = commercial fishing vessels are classified according to their gross registered tons of displacement, e.g. vessel class 2 is 5-50 tons, 3 is 51-150 tons, 4 is 151-500 tons.

vessel fishery cure = the process of salting fish (usually cod) on board ship.

vessel monitoring system = a system for tracking fishing vessels electronically using satellites. Abbreviated as VMS. Also called a black box.

vestibule = a chamber leading into other cavities or passages, e.g. of the inner ear, of the utriculus, sacculus, lagena. Space within the oral hood of Amphioxus.

vestige (noun) = rudimentary or degenerate structures that have degenerated during evolution or ontogeny. A remnant of a structure that functioned earlier in development or evolution of the species.

vestigial (adjective) = rudimentary, degenerate; said of structures that have degenerated during evolution or ontogeny.

vexillifer larva = an elongate, planktonic, pre-adult stage of most, perhaps all, Carapidae characterized by a long, filamentous, usually ornamented dorsal appendage, the vexillum.

vexillum = a long dorsal appendage in larvae (vexillifer larvae) of Carapidae and Pyramodontidae. Commences as a small pigmented thickening on the front end of the dorsal fin, changes to a small papilla, then to a soft forked projection and finally a long-lobed complex structure. The appendage degenerates when the larva assumes a benthic mode of life. It is composed of bilaterally paired, segmented components, each of which contains a proximal and a distal element.

VHS = abbreviation for viral haemorrhagic septicaemia.

viable population = a population of fish in a state that maintains its vigor and its potential for evolutionary change.

vial = a small, round and straight-sided glass or plastic container used for storing smaller museum specimens or parts thereof; submerged in a larger glass jar filled with preservative in the case of fish so the contents do not dry up.

Vibert box = a box in which fish eggs are placed prior to burial in gravel for the purposes of hatching. Hatching success is apparently less for eggs in the boxes than those buried directly in the gravel.

vibriosis = an acute systemic bacterial disease caused by *Vibrio anguillarum* or other *Vibrio* spp., often in spring in juvenile anadromous salmonids after transfer to sea water in an aquaculture facility. Symptoms include ulcers, haemorrhaging, rapid breathing, dropsy, skin lesions, popeye and lethargy. Antibiotics are needed for treatment.

vibsarine = vibsarine A is a plant piscicide from the leaves of *Viburnum awabuki* (Caprifoliaceae), used in Okinawa, Japan. Other piscicidal plant chemicals include callicarpone, huratoxin, ichthyothereol, inophyllolide, juglone, justicidin, maingayic acid, and rotenone, all q.v.

vicar = 1) one of a pair or more of forms that are closely related and ecologically equivalent but separated by a geographical barrier. See vicarious species.

vicar = 2) the priest or cleric in charge of a parish. In the nineteenth century especially, often devoted to natural history.

vicariance = the presence of closely-related taxa or biota in different geographical areas; these have been separated by a natural barrier, a vicariant event, e.g. the rise of a mountain range isolating drainages.

vicariant = one of two or more closely related taxa isolated by a barrier.

vicarious fishes = those presumably non-diadromous freshwater representatives of partly or primarily marine groups, e.g. *Siniperca*, *Lota*, *Plagioscion*, freshwater Ariidae, Plotosidae, Apogonidae, Atherinidae and Syngnathidae; landlocked or non-diadromous Galaxiidae.

vicarious species = vicar.

*vice* = in place of; in succession to. Abbreviated as v.

vice-admiral = historically, the master of the second English fishing vessel to reach a harbour in Newfoundland, having certain privileges for the season under the fishing admiral (*q.v.*).

*vide* = see, consult. Abbreviated as v.

*vide etiam* = see also. Abbreviated as v. et.

*videlicet* = namely. Abbreviated as viz.

vidi! = an indication that an author has seen the material or work.

view = the appearance or aspect of a bone or other anatomical feature when viewed from a specific position.

Vigneron-Dahl trawl = the usual rig of an otter trawl with long cables that frighten fish toward the net.

village pond = a small pond, either natural or artificial and usually within a village, and occasionally used for fish culture.

villi = plural of villus.

villiform = crowded into coarse velvety bands or patches.

villiform teeth = fine, long, crowded teeth in a patch or band having the appearance of velvet.

villosa = short hair-like or finger-like processes.

villus (plural villi) = a slender hair-like process, as those which extend into the intestine. They normally function as sensory organelles or to increase surface area for absorption.

vinegar cured fish = fish preserved in vinegar, salt and sometimes spices.

vinegar eel = *Turbatrix aceti*, small (2mm), nematodes which live in weakly acidic water and are used as fish food. They are cultured in a special cider vinegar solution and fed pieces of rotting apple. The nematodes need to be filtered out of the solution using a funnel and a coffee filter.

vippick = a small fishing rod (Shetland Isles dialect).

Vique's Law = man needs religion like a fish needs a bicycle.

viral haemorrhagic septicaemia = an acute or chronic disease of salmonids, such as rainbow trout in farm ponds, causing loss of appetite and of schooling behaviour, darkened colour, bleeding, hyaline gills and exophthalmia. It is associated with temperature changes and with

the late winter and spring seasons when temperatures are below 8°C. Abbreviated as VHS. Also called Egtved disease and trout pest.

virgin = a fish (e.g. a salmonid, shad), whether male or female, which has not spawned, and is maturing to spawn. Also called a maiden.

virgin biomass = a stock's theoretical carrying capacity. The average biomass of a stock that has yet not been fished (in an equilibrium sense). Biomass of an unexploited (or quasi unexploited) stock. Rarely measured. Most often inferred from stock modeling. Used as a reference value to assess the relative health of a stock, monitoring changes in the ratio between current and virgin biomass ( $B/B_0$ ). It is usually assumed that, in absence of better data,  $B = 0.30 B_0$  is a limit below which a stock should not be driven. Abbreviated as  $B_0$ ,  $B_v$  or  $B_v$ .

virgin stock = a stock of fish that is never caught by fishing. Growth and recruitment add biomass while death removes biomass. The biomass stays steady apart from natural fluctuations caused by good and bad years.

virgin water = water not previously used for fish culture.

Virginia cure = gutted alewives, cured in strong brine for a week or more and packed in barrels with dry salt (U.S.A.). Also called tight pack, hard cure and pickled alewives (Canada).

virtual population = utilised stock (the part, by number, of the fish alive at a given time, which will be caught in the future).

virtual population analysis = an algorithm for computing historical fishing mortality rates and stock sizes by age or length, based on data on catches, natural mortality, and certain assumptions about mortality for the last year and last age group. Essentially reconstructs the history of each cohort or year class over its life in a fishery, assuming that the observed catches are known without error. Abbreviated as VPA. Also called cohort analysis.

virgin stock = a stock in its natural condition before anyone has fished it.

virr = the corner of fish mouth (Shetland Isles dialect).

virtual aquarium = reproduction of an aquarium on a computer, often as a screensaver. The species of fish can be selected, and even fed, virtually.

virtual tautonymy = the nearly identical spelling, or same origin or meaning, in nomenclature, of a generic or subgeneric name and the species or subspecies name in a binomen or trinomen originally included in the genus (not a term regulated by the International Code of Zoological Nomenclature).

viscera (plural) = the organs in the body cavity of a fish.

visceral arch = one of the series of skeletal bars on either side of the pharynx, which comprise the gill arches and the jaws.

visceral clefts = the jaw, hyoid and gill arches.

visceral pericardia = a single membrane around the heart.

visceral peritoneum = a single membrane around the viscera.

visceral skeleton = the skeleton derived from the visceral arches, the mandibular arch forming the mandibles, the hyoid arch and the branchial arch, collectively called the splanchnocranum or viscerocranum.

viscerocranum = see visceral skeleton.

viscid egg = adhesive egg (a fish egg that is deposited on sand, gravel, plants, etc. to which it sticks by means of the egg's sticky surface. In aquaculture situations this is inconvenient and the adhesiveness can be removed by milk or tannin).

viscosity = a stock throughout its area of distribution does not have complete and instantaneous mixing of individuals. A fishery on one area of a stock will impact the whole stock on a time scale and to a degree that is a function of the stock's viscosity.

viscous = slimy.

viscus (singular) = one of the large internal organs found in the abdomen; usually appearing in plural form as viscera.

Vishnu = Mahavishnu took the form of a fish to retrieve the vedas from the Asura Hayagreevan (head of a horse) and also to safeguard herbs and seeds at the end of one cycle of creation.

visible implant tag = a small, alphanumeric tag (1-2 mm) implanted into any clear tissue such as behind the eye.

visible implant elastomer tag = a fluorescent plastic tag, visible externally although implanted into clear tissues with a small needle. The tag is liquid but becomes a pliable solid after injection. Often used to identify groups of fish.

visibility = the depth at which the black and white parts of a disk can just be distinguished; a measure of water clarity.

visual survey = an estimate of stock abundance made by counting fish, e.g. by a SCUBA diver, a camera set-up, from a submarine or from an aeroplane for surface schooling fish.

visual transect = a survey by sight of a sample area in a long continuous strip.

*visum* = seen. Abbreviated as v.

vital rates = rates (such as natural mortality, fecundity, and growth rates) affecting the dynamics of a stock.

vitamin C = ascorbic acid. A deficiency in fish manifests in spinal and hyaline cartilage abnormalities and reduced wound healing, through affects on normal collagen production.

vitelline membrane = a membrane, product of the ooplasmic surface which adheres closely to the outer boundary of the ooplasm, but as fertilization separates from the surface as a distinct membrane.

vitelline vein = incorrect name for the common cardinal vein (the anterior cardinal vein returns blood from the head and the posterior cardinal vein from the trunk, joining together as the common cardinal vein).

vitelline vesicles = arteries and veins of the yolk region.

vitreous body = the viscous liquid filling the eye between the lens and retina.

vitrodentine = the enamel-like substance covering the surface of cosmoid scales.

vitta = a stripe or band of colour.

vittal = adjective for vitta.

vivarium = a place where living fish and other organisms are kept as food (a stew), as objects of interest or for scientific study.

vivary = vivarium.

viver = vivier (1 and 2).

vivier = 1) boats and trucks that carry live fish.

vivier = 2) a fish pond.

viviparity = the condition of giving birth to active, free-swimming young.

viviparous = adjective for viviparity.

vivotype = an unofficial term in nomenclature for a living type specimen requiring special handling and storage.

viz. = abbreviation for *videlicet*, meaning namely.

viziga = a dried food delicacy in Russia and Asia, made from spinal cords of dried sturgeon.

VLO = a photophore above the ventral fin in Myctophidae.

VMS = abbreviation for vessel monitoring system, a system for tracking fishing vessels electronically using satellites.

Vn = a photophore in front of the eye below the olfactory capsule of Myctophidae.

VO = a row of photophores on the abdomen behind the ventral fin in Myctophidae. Also called maculae ventrales.

voamd = tainted as with fish or meat (Shetland Isles dialect). Also spelled vomd or vam'd.

vol. = abbreviation for volume.

voltine = referring to the number of broods or generations, usually in a year or a season, e.g. univoltine, multivoltine.

volume of a lake = the sum of the volume in each of the strata bounded by bottom contours.

volumetric unit quota = a quota based on volume of organisms taken.

vomd = voamd.

vomer = prevomer (a frequently toothed median or paired dermal bone in the middle of the roof of the mouth covering the ethmoid ventrally and in front of the parasphenoid. Incorrectly called vomer).

vomerine teeth = teeth on the vomer or prevomer.

von Bayer trough = a 30 cm v-shaped trough for counting fish eggs.

von Bertalanffy growth curve = a model of individual fish growth as a function of time. Named after its proponent, Ludwig von Bertalanffy, this growth curve is an entry point to more complex models of the dynamics of fish populations. The growth equation is  $L_t = L_\infty[1 - e^{-K(t-t_0)}]$  where  $t$  = age,  $L_\infty$  = asymptotic length (mean length of a very old fish), and  $K$  = the curvature parameter showing how fast a fish approaches its maximum value. A short-lived species will have a high value of  $K$  and approach  $L_\infty$  rapidly while other species have a low  $K$  and take a long time to reach  $L_\infty$ . These parameters can be estimated from the Ford-Walford method where length at a given age is plotted against length one year earlier. The intercept on the 45 degree line is  $L_\infty$  and the slope is  $e^{-K}$ .

voracious = said of fish which live mostly on other fish.

-vorous (suffix) = feeding upon.

voucher = supporting evidence providing tangible proof of something. May be a specimen, photograph, written record of diagnostic characters, etc.

voucher specimen = a specimen archived in a permanent collection (usually in a museum, an institution with a mandate to preserve materials indefinitely). It serves as physical evidence of occurrence at time and place and of any identifications and descriptions based on it, always assuming that it is archived with adequate collection data. Type specimens are voucher material.

voyage = 1) an extended offshore trip that involves a return to the point of origin. A passage is a leg of a voyage.

voyage = 2) the catch of fish taken, or the proceeds of the catch.

voyage = 3) the period of the offshore trip.

VPA = virtual population analysis.

vs. = versus, against, as opposed to, in contrast to. Also as v.

vulgar = an obsolete term for a common name. See vernacular name.

vulnerability = catchability, but usually applied to separate parts of a stock, for example those of a particular size, or those living in a particular part of the range (Ricker, 1975).

vulnerable = 1) that part of a population likely to be captured by a particular gear.

vulnerable = 2) in the IUCN Criteria for threatened species, a taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future. Abbreviated VU.

## W

wacky worm = a rigging method where the hook is through the middle of the worm and is left exposed.

wad = a concentration of fish (or seals) (Newfoundland).

wade = the front part of a boat into which fish are drawn (Shetland Isles dialect). Also spelled wed.

wadi (plural widyan but usually wadis in English) = Arabic for a watercourse, usually dry except during the rainy season and sometimes permanently dry.

wade = fish appearing on the surface or leaping out of the water (Shetland Isles dialect).

wade fishing = angling while wading through the water.

wader belt = a belt around the waist of waders to prevent water entering should the angler fall into the lake or river, a particularly dangerous situation.

waders = waterproof boots extending to the hip or chest used by anglers and scientists when fishing. Made of latex, neoprene, Gortex, etc

wading = crossing a shallow water body on foot.

waggler float = in angling, a type of sensitive float attached to the line through a hole at its base. See float for more details. Types of waggler are crystal, insert, bodied, self depth adjusting, and stepped, q.v.

waif = a stray from its principal habitat or range.

waim = wame.

waith horn = vaity-kabe (an upright piece of wood fitted on the gunwale of a boat with a tip notch to enable fishing line to run freely (Scottish dialect).

walk the dog = retrieval of a topwater lure by downwards movements of the rod tip.

Walker type = ambiguotype (an unofficial term in nomenclature for an inadequately described type).

walking fish = any of various fishes able to survive and move about for short periods of time on land, e.g. mudskippers, walking catfish, climbing perch.

walking sinker = sinkers designed to move across the bottom, avoiding snags.

wall = armouring (the outer wall of large mesh netting forming part of a trammel net, q.v. Also called outer net, outer wall, outwall, outwalling, trancher, walling, windows).

walleye = 1) the yellow walleye (*Sander vitreus*) is a popular North American sport fish with a milky cornea and prominent eyes.

walleye = 2) an eye with a milky-white cornea, a light grey or bluish-white iris, or an eye turned outwards to show more of the white of the eye than usual (wall-eyed means all these plus a wild, irrational staring of the eyes and a divergent squint).

walleye epidermal hyperplasia-associated virus = virus-like particles found in epidermal tumour cells of walleye (*Sander vitreus*); relationship to walleye epidermal hyperplasia unknown.

walleye rig = a manufactured rig for catching walleye (*Sander vitreus*) with two baits, one above the other, fished on the bottom or beneath a float.

walleye sarcoma-associated virus = virus-like particles found in walleye (*Sander vitreus*) with sarcoma; relationship to sarcoma unknown.

walling = armouring (the outer wall of large mesh netting forming part of a trammel net, q.v. Also called outer net, outer wall, outwall, outwalling, trancher, wall, windows).

wallow = to roll on the ground as a fish on dry land (British dialect).

wallybobber = a large bobber, hook and minnow used to catch pike and muskellunge.

Walton, Izaak = 1593-1683, author of "The Compleat Angler", first published in 1653 and the classical work on angling. A fifth edition in 1676 with Charles Cotton added material on fly-fishing.

wame = the entire salmon roe.

wampas = wampish.

wampes = wampish.

wampish = to twist and swerve like a fish swimming (Scottish dialect). Also spelled wampas, wampus and wampuz.

wampuz = wampish.

wand = a fishing rod.

wantage rod = a ruler-like wooden measuring rod used to determine how much liquid was needed to fill a barrel, *q.v.* See also gauge rod and sample rod.

wanting = lacking or absent. Used in older descriptions of fishes, e.g. wanting pelvic fins is not a wish on the part of the fish.

wap = to cast a fishing-line or to fish a river (Scottish dialect).

wapper = a fisherman; an angler (Scottish dialect). Also spelled whauper.

warden = an official who enforces game laws relating to fish.

warm monomictic = said of a lake with a winter overturn and a temperature never below 4°C.

warm spring = a spring with temperatures 9.5°C above mean air temperature.

warm water = water bodies exceeding 24°C in summer; fishes occurring in such waters.

warmwater fish = a general term for non-salmonid fishes that generally have at least one spiny ray, have pelvic and pectoral fins located behind the gills, and are usually suited for water that consistently exceeds 20°C and may be 25-32°C (or 15-27°C, sources differ).

warp = 1) the heavy cable used to tow trawls, seines, etc. May be up to 2 km long on large trawlers.

warp = 2) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for fishes.

warp = 3) a count of three herrings used in the retail business. See hundred and tally.

warp = 4) a catch of salmon in a river net (Scottish dialect).

warp block = a block used to guide a fishing line.

warp drum = winch barrel.

warping end = a small, spool-shaped, auxiliary drum with filleted flanges at each end fitted outside the main part of a winch for general use in handling fishing gear.

warping head = warping end.

warping winch = a winch used solely for warping, on which a rope may be wound under power but not stored.

warstling herring = part of a fisherwoman's cry, "herrings all alive".

wash = 1) a flood plain or active channel of an ephemeral stream.

wash = 2) immersing split and salted cod in brine at various stages in making dried fish.

wash box = a container used to wash salt cod before drying on flakes, *q.v.*

wash house = a room or an area of fishing premises where salted fish are processed for drying (Newfoundland).

washer = a crew member who processes cod in salt water (Newfoundland).

washing = 1) a length of netting connecting the landward end of a cod trap leader to the shore (Newfoundland).

washing = 2) spawning shad (*Alosa sapidissima*) breaking the water surface.

washing tub = a wooden container in which salted cod are placed at various stages in preparation for drying (Newfoundland). Also called washing vat.

washing vat = washing tub.

washy = a small cod, in poor condition (Orkney dialect).

wasp speir = waster.

waspeir = waster.

wasper = waster.

waste = fish that are caught but do not have market value as food, or fish parts as a by-product of the production process. May be used for fish meal, fish oil and other byproducts.

waster = a fish spear or leister used especially on salmon (Scotland). Also called wester, wasper, waspeir, wausper, wawsper, vauch spear, wasp speir and vaspeir.

wastewater = water that carries wastes from homes, businesses, and industries; a mixture of water and dissolved or suspended solids.

watch-buoy = a float marking the location and ownership of a net or trap.

water = 1) fish water is a fixed volume of water in which a fish has been kept for a certain period. This water contains external metabolites and can be used in various experimental procedures, e.g. predator/prey interactions without the predator present (metabolite production by the predator may be suppressed when prey is present).

water = 2) to immerse split and salted cod in water in preparation for drying.

water bailiff = an official in charge of fishing rights. See bailiff.

water bloom = algal bloom (the rapid growth of algae on the surface of lakes, streams, or ponds; stimulated by nutrient enrichment. The water takes on a green colour).

water body = a relatively large mass of water in a confined area, e.g. pond, lake, river, etc.

water column = the water mass between the surface and the bottom.

water content = in reference to fish and fish products the amount of water as a percentage of the net weight. It is about 80% in fresh white fish (q.v.), and at 25% there is little bacterial spoilage. Also called moisture content.

water discharge = discharge (flow of water in a river or drainage basin, measured in cubic feet per second (cfs) or cubic metres per second passing a certain point).

water edge = the line where land and water meet.

water flea = *Daphnia* are used as food for fish in aquaria.

water gate = a gate for confining or releasing water.

water glass = fish glass (a tube with a glass end used to locate schools of cod from a boat in Newfoundland).

water hardening = fertilised eggs becoming turgid in contact with water.

water hardness = the concentration of calcium and magnesium ions in water expressed as p.p.m. or mg/l of calcium carbonate equivalents. Water hardness expressed in degrees of hardness. 0-4 is very soft, 5-8 soft, up to 30 which is extremely hard water. Note that different countries use different measures: 1 English (Clark) degree is 14.3 p.p.m. calcium carbonate, 1 American degree is 17.1 p.p.m. calcium carbonate and 1 French degree (fh) is 10.0 p.p.m. calcium carbonate. However 1 German degree (dh) is 17.9 p.p.m. calcium oxide. Confusingly the German dh is used generally for degrees of hardness.

water haul = any fishing net that comes up empty.

water knot = an angling knot used to tie together two pieces of monofilament line of the same or different breaking strains. Various websites have animated steps showing how to tie this knot.

water line = the juncture of sea and land, varying with the tide.

water mass = a body of water identified by its temperature and salinity.

water parting = a boundary line separating the drainages areas of two streams.

water quality criteria = specific levels of water quality desired for identified uses, including fish production.

water resources = overall amount of water in the area considered.

water system = a river with all its tributaries.

water table = top of the zone of saturation, the upper boundary of the ground water.

water wash = to soak dried and salted cod in water to remove salt preparatory to cooking.

water-collecting area = catchment basin (the entire area from which drainage is received by a river or a lake; most generally used in reference to surface runoff).

water-hardening = the phenomena involving the movement of water into the perivitelline space (between the external capsular membrane and the vitelline membrane) and the toughening of the capsular membrane of a teleost egg freshly released into water. Takes about a day in Salmonidae. Egg diameters in the literature may be water-hardened or not, often without mentioning which.

water-horse (noun) = 1) a stack of salted cod-fish piled in layers to drain, having recently been removed from salt and washed clean in Newfoundland. After the piling and draining (or pressing out), water-horse fish were taken up onto the drying rack or flake. Water-horse fish were very susceptible to damage of various kinds and had to be carefully tended for a number of days.

water-horse (noun) = 2) a trough or tube used for washing fish after salting (Newfoundland).

water-horse (verb) = 3) the process of piling, stacking and draining fish.

waterbody = aquatic habitats where fishes and other organisms live, such as rivers, lakes, dams, creeks, streams, or ponds.

watercourse = a natural or man-made channel through which water flows.

watercraft = 1) a general term for various types of boats.

watercraft = 2) the study and knowledge of the environment and the fish that live in it.

waterfall = fall(s) (free-falling water over a cliff; falls are often a barrier to fish movement, sometimes a complete barrier or only passable to fish able to leap such as salmonids. Falls may refer to one waterfall or a series).

watering hole = a pub (idiom).

waterman = a commercial fisherman.

watermarked = the dully darkened skin of a salmon entering fresh water prior to spawning.

watermelon = a hook with a large gap between the shank and point.

waters = a series of freshwater ponds linked by a stream (Newfoundland).

watershed = strictly an elevated boundary area separating tributaries draining to different river systems; often used in American usage to mean a drainage basin, i.e. the area which supplies water by surface and subsurface flow from precipitation to a given exit point. See also catchment and drainage basin.

waterside = the shore of a body of water.

waterway = a navigable inland body of water, usually implying some or major modification on natural conditions by man.

wattle fencing = a method used in eastern Europe to prevent ponds freezing. The wattle material, supported by poles and framework, covers the pond. The water level is lowered to ensure a cushion of air remains between the water surface and the snow-covered wattle, ensuring aeration.

wauch = a bank or mound of stones set up in a river as a salmon trap (Scottish dialect). Also spelled vauch.

wauch net = a salmon net used at a vauch, *q.v.*

wausper = waster.

wawsper = waster.

wayward supper = salt fish stewed to tenderness in milk or fried, accompanied by boiled parsnips.

weak = scarcely evident, e.g. an anatomical character that is difficult to discern or is poorly developed.

weak stock = a fish stock of high to moderate risk of extinction or of high concern as variously defined by management authorities.

weaning = in aquaculture the transition between live food and artificial food for larval fishes.

Wear shot net = an encircling net set by boat used in salmon fishing (Northumberland dialect).

weaver knot = a form of non-sliding knot used in most netting.

web = a length or quantity of twine for knitting a net.

webbing = lint (netting in the main body of a drift or gill net. Also called body, middle twine, middle yarn, netting, sheet, yarn).

Weberian apparatus = four bones and associated tissues connecting the gas bladder to the inner ear and conveying pressure changes and sound. Usually the definition includes the first four vertebrae (two and three may be fused), a supporting unit or pars sustentaculum comprising two transverse plates projecting downwards from the fourth vertebra enclosing a circular space for the aorta and the neural complex comprising modified neural arches and spines. Found in the Cypriniformes and Siluriformes.

Weberian vertebrae = the four anterior vertebrae associated with the Weberian apparatus.

Weberian ossicles = the four bones in a chain derived from vertebrae in the Weberian apparatus forming the auditory unit or pars auditum (anterior to posterior): claustrum, scaphium, intercalarium and tripus. Also called ossa auditoria.

wed = 1) to leap out of the water as a trout after a fly (Shetland Isles dialect).

wed = 2) wade.

wedge = a small, cut-out and lens-less portion of the pupil margin of the eye. This widens the field of vision and allows more light to enter the eye, rather than falling on the iris. Usually found antero-ventrally for improving forward vision. Found in a various species of salmonids and cyprinids, for example. Also called pimple, notch or notche. See also aphakic space.

wedge knot = a general purpose knot used in connecting line to leader. A knot is tied in one end of the two lines and fed through and back a loop in the other line, and cinched tight. Various websites have animated steps showing how to tie this knot.

weed fish = 1) an unwanted fish species.

weed fish = 2) small fishes serving as food for other fish in aquaculture.

weed killer = a chemical for destroying weeds, used in pond culture of fish.

weed mat = aquatic vegetation forming an almost complete coverage of the water surface; favoured by fish as a protected area from predators and insolation.

weedguard = a piece of stiff monofilament or light wire attached to the top of the hook and extending in front of the hook point and bend to the hook eye. This device reduces fouling with weeds but does not inhibit hooking a fish. There are various patterns of these hooks, illustrated in angling books and catalogues.

weedless hook = a hook with a weedguard.

weedless lure = a lure designed to be fished in vegetation without becoming entangled.

weedless spoon = a wobbling spoon with a fixed hook and a guard used when fishing in weedy waters.

weedline = an abrupt edge to a weed bed caused by a change in depth, bottom sediment, etc. May be the inside or outside edge of a weed bed.

weedy odour = blackberry odour (an odour found in some fish flesh caused by dimethylsulphide formed from dimethyl- $\beta$ -propiothetin in the diet when fish feed on pteropods such as *Spiratella retroversa* and *S. helicina*, e.g. in mackerel and cod respectively. Resembles a sulphide, gunpowder or paraffin-like odour).

weedy water = a water body overgrown with weeds.

weel = a wicker trap set on a stream bed to catch fish migrating up or downstream, often eels (English dialect).

weeping water = waterfall in New Zealand; translation from the Maori waitangi.

weigh of fish = one hundredweight (0.802 kg (long), 45.359 kg (short)).

weight = 1) ballast (a weight used to sink a fishing line).

weight = 2) ballast (one of a series of weights along the footrope of a fishing net).

weight = 3) a bundle of fishing lines (Shetland Isles dialect).

weight = 4) the vertical force exerted by a mass as a result of gravity.

weight = 5) in statistics, a coefficient assigned to elements of a frequency distribution in order to represent their relative importance.

weight loss = a decrease in fish weight occasioned by unfavourable conditions.

weight note = a receipt from a fish merchant to a fisherman recording the amount of cod delivered (Newfoundland).

weight-at-age = the average individual weight of the fish in each age class of a particular stock. Weights-at-age vary over time as well as between stocks.

weight-at-recruitment = weight of a fish when recruited to a fishable stock.

weight-forward = a type of fly line with most of its weight in the first 10 metres of line. The large section of this line is called the line belly, with a long tapering section towards the front and a short tapering towards the back where it becomes a thinner running line.

weight-length relationship = relation between weight and length of individual fishes, usually expressed as an exponential curve.

weighted usable area = the habitat area available to support a species or one of its life stages. May be expressed as the actual area or as a percentage of habitat area predicted to be available according to stream length, flow regime, substrate, and other factors.

weighting = 1) a method of giving different importance values to different characters in systematics.

weighting = 2) use of weight (4), see above.

weiner = a fish weiner is a smoked fish sausage. Also spelled wiener.

weir = 1) nets or fences set in streams or along the coast to direct fish into a holding container for easy capture. Some weirs take advantage of the falling tide to capture fish; others catch upstream migrating adults; others strain fish out of the water on a screen through which the water drains, or into bags suspended from the screen; along a chute with a bag or box at its end; or in an arched weir, higher in the middle to direct water laterally, to the shore ends where a trap awaits the fish.

weir = 2) a dam in a river to stop, raise and divert the water, for the purpose of conducting it to a mill, forming a fishpond, etc. When uncontrolled, the weir is termed a fixed-crest weir. Other types of weirs include broad-crested, sharp-crested, drowned, and submerged.

weir = 3) a bank or levee to hold a river in its bed or to direct it to a new bed.

weir feeler = the operator of a weir has to determine the number of fish captured in the weir before striking a bargain with a dealer. A weighted length of copper wire is lowered over the side of a boat in the weir, the weight is held just off the bottom and the wire looped over a finger and, as the boat is rowed around the weir, fish striking the line can be felt and counted. Expert weir feelers can distinguish numbers, sizes and even species caught.

well = 1) a storage compartment in a fishing vessel for live fish, usually in a sport fishing boat. May have perforations to allow water to flow in and out through the hull. Also called live well.

well = 2) to boil or heat; used in welling livers for their oil. See also try.

well boat = a fishing boat having a compartment or well that allows water to enter and where fish can be kept alive.

well smack = a fishing vessel using hand lines or longlines for cod and turbot in the eighteenth century that could stay at sea for some time, keeping fish alive in a well (holes in the planking allowed free circulation of sea water).

well-fished= well-supplied with fish.

wendigo = splake (an artificial hybrid of male brook trout (*Salvelinus fontinalis*) and female lake trout (*S. namaycush*). The name comes from speckled trout (an older name for brook trout) and lake trout. Wendigo is an alternate a name decided on by a contest sponsored by the Carling Conservation Club. Introduced to many waters in North America, particularly in Ontario where they mature earlier than lake trout and before lampreys become a significant scourge).

went = a bend in a fishing line when not cast in one stretch (Scottish dialect).

Wentworth-Udden scale = particle size; the size ranges for sediments. The scale is an international standard as follows:-

Size Range	Particle Name
>256 mm	boulder
64-256 mm	cobble
4-64 mm	pebble
2-4 mm	gravel, granule
1/16-2 mm	sand
1/256-1/16 mm	silt
<1/256 mm	clay

West India(n) = a grade of dried and salted cod shipped to the West Indies from Newfoundland.

wester = waster.

western gill disease = nutritional gill disease (hyperplasia of gills caused by a deficiency of pantothenic acid in the diet).

western roll cast = reverse cast (casting across the body on the off-hand side of the stream in nymphing (the right side of the stream for a right-handed angler, and vice versa)).

Westoll line = roughly concentric lines in the cosmine at the base of lungfish scales assumed to be caused by resorption and growth. Also present as large structures between head shield plates.

wet all one's salt = said of a Newfoundland fishing vessel having used up all its salt on a full catch of fish.

wet barrel = a barrel used to contain wet materials, particularly fish, the staves having to be much tighter than barrels used for dry materials.

wet bundh = a perennial irrigation pond used for carp breeding (India).

wet collection = museum specimens or parts thereof stored in ethanol, isopropanol, formalin or other preservatives. Also called fluid collection.

wet cure = preserving fish by immersion in brine.

wet cured = brine cured fish (fish treated with salt in a water-tight container so that they cure in the pickle that is formed. Also called brine cured, brine salted, tank salted, wet cured, wet salted).

wet dense smoke = distilled smoke (smoke with a high moisture content produced by slow burning wood, used to smoke fish).

wet deposition = acid rain (rain falling through an atmosphere containing sulphur dioxide and nitrogen oxide pollutants thus making the rain acidic (pH less than 7.0); in lakes without the ability to neutralise the acid survival of fish eggs and young is compromised. Also referred to as acid deposition and wet deposition).

wet fish = 1) fresh as opposed to frozen, dried or cooked.

wet fish = 2) fish preserved with ice or chilled but not frozen.

wet fish = 3) fish caught at sea and not landed and dried, e.g. the historical French cod fishery on the Grand Banks.

wet fish = 4) wetfish.

wet fish = 5) split and salted cod, but not dried (Newfoundland).

wet fly = a lure imitating an insect and fished below the water surface.

wet fly swing = typical fishing method for a wet fly, downstream and across the current.

wet lining = 1) fishing with a sinking fly line, usually down and across the current.

wet lining = 2) commercial fishing without restrictions on the number of licensed fishing vessels with access (Australia).

wet one's line = 1) angling.

wet one's line = 2) fishing for cod in Newfoundland.

wet preservative = the liquid used as a storage medium for fish specimens, e.g. ethanol, isopropanol, formalin. Also called fluid preservative.

wet reduction = a method of production of fish meal from fatty fish such as herring.

wet salted = brine cured fish (fish treated with salt in a water-tight container so that they cure in the pickle that is formed. Also called brine cured, brine salted, tank salted, wet cured, wet salted).

wet salting = immersion of fish in a strong brine or pickle; pickling.

wet stack = salted fish, kept stacked before drying.

wet wade = wading in water without any waterproof covering.

wet weight = the weight of a whole fresh fish.

wet/dry filter = a type of biological filtration in aquaria which has media exposed to the air to aid in nitrification through bacterial growth. Common forms are trickle filters and rotating paddle wheel filters. The air/water mix promotes bacterial growth and the bacteria remove ammonia and nitrites. Also called ammonia tower.

wetland = land where water saturation is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the surrounding environment. There is usually shallow water present for at least part of the year. Other common names for wetlands are bogs, ponds, vernal pools, potholes, estuaries, swamps, and marshes.

Westoll lines = more or less concentric lines of discontinuity in the cosmine of Diploï, probably due to cyclic resorption and redeposition during growth occurring on the bases of individual scales and also as large structures between headshield plates.

wetfish = cartilaginous and finfish (Australia).

wetland = an area of low-lying submerged land, or land periodically inundated by fresh or salt water.

whackle = to whip a stream in fishing, to fish with a fly (Scottish dialect).

whale = 1) a marine mammal.

whale = 2) a codfish (slang, Cheltenham College).

whale = 3) a sardine (slang, Royal Military Academy).

whale fall = the body of a dead whale that has fallen to the ocean floor. In shallow water it is quickly scavenged but in ocean depths it forms an ecosystem lasting for decades involving invertebrates and some fish such as sleeper sharks. A series of whale falls may form stepping-stones between more widely spaced habitats such as hydrothermal vents and cold seeps.

whales = anchovies on toast (slang).

whang = a strip of dried eelskin used as a hinge for a flail (Scottish dialect).

wharf (plural wharfs or wharves) = a landing place or pier supported by piles where vessels may tie up and load or unload a catch of fish.

wharves = plural of wharf.

what's that got to do with the price of fish = a phrase used to question the accuracy of some statement.

what's up = a gene name for a zebrafish mutation affecting the ear (initially no otoliths or very tiny otoliths, sometimes one or two otoliths present later). See also einstein, half stoned, rolling stones, van gogh, among many others.

whauper = a fisherman; an angler (Scottish dialect). Also spelled wapper.

wheel = 1) a series of lift nets on a wheel frame that is rotated by the river current, catching migrating fish.

wheel = 2) a cross-sectional centre cut from a large fish such as swordfish and sharks.

wheel organ = the apparatus consisting of the velum and velar tentacles in the mouth of Amphioxo.

whemmle = to catch fish by means of a hang net (*q.v.*) (Cumberland dialect).

whemmle net = a drift or hang net (*q.v.*) (Cumberland dialect).

whemmler = a fisherman who uses a whemmle net (Cumberland dialect).

whiff = whiffling.

whiffle = whiffling.

whiffing = trolling (trailing a fishing line (or trolling line) behind a moving boat. In commercial fisheries a speed of 2-10 knots is used to catch tunas and their relatives.

whip = 1) a light fishing rod with the line tied directly to the tip; used to catch very small fish on very light tackle very quickly. Whip length is usually 6 m and line strength can be less than 0.5 kg.

whip = 2) a method of tying line to a spade-end hook where the line is fastened to the shank by a series of loops, drawn tight. Also called snelling, *q.v.*

whip finisher = a tool used in tying flies in fly fishing. It enables the fly tier to lay down a smooth and compact head of the fly.

whippack = a small fishing rod (Shetland Isles).

whipping drum = warping end (a small, spool-shaped, auxiliary drum with filleted flanges at each end fitted outside the main part of a winch for general use in handling fishing gear).

whippy bough trap = a fishing rod is bent and the fixed line attached underwater with the baited hook free. When a fish takes the bait, the attachment is released and the tension in the bent rod hooks the fish and holds it out of the water away from predators to be collected later. Also called automatic fishing line.

whirling disease = a parasitic disease of trout caused by the myxosporidean protozoan *Myxosoma cerebralis*. The parasite enters spine of the fish at a stage before the cartilage has

turned to bone. Causes bent spines which force the fish to swim in the characteristic "whirling" motion, that is also called tail hunting. The spores of the parasites can remain in the mud of ponds for a long time. Also called black tail disease and twist disease.

white fish = 1) general term for fishes which have fat concentrated in the liver, not the flesh; lean fish with less than 2% fat in the flesh, e.g. cod. Used in the United Kingdom. Note that whitefish is a widely used common name especially for members of the Salmonidae (Coregoninae).

white fish = 2) silvery or white fishes, e.g. species breeding in the Mekong River, Cambodia, during the dry season and entering the Tonle Sap (lake) with rising water levels where they form a fishery, cf. black fish. Taxa include *Barbodes*, *Cirrhinus*, *Cyclocheilichthys*, *Pangasianodon*, *Chitala*.

white fish in the net = an old Scottish game in which two players hold a plaid stretched out between them for the other players to leap over, and try to foil each attempt by entangling the leaper.

white fish meal = fish meal, q.v., made from white, non-fatty fish.

white fishing = 1) fishing for white fish.

white fishing = 2) fishing for haddock, ling, etc. in contrast to herring fishing.

white fishing = 3) a French-Canadian term for [ice fishing](#), rarely seen in English (fishing through holes cut in the ice of lakes or rivers, using specially designed gear and often with a shack positioned over the hole to mitigate the weather conditions. See also [ice fishing](#) under Symbols).

white gold = valuable commercial fish, e.g. the Patagonian toothfish or Chilean sea bass (*Dissostichus eleginoides*, Nototheniidae). See also pirate fishing.

white herring = 1) a fresh herring.

white herring = 2) a pickled or salted but unsmoked herring.

white meat = a commercial measure of fish flesh colour, e.g. canned tuna is white meat or white tuna when it has a diffused luminous reflectance of not less than 33.7% of that of magnesium oxide when measured by a prescribed method. Equivalent to 6.3 Munsell units. See also light meat and dark meat.

white nape = to remove the black lining from the napes of split fish.

white roe = soft roe (the milt or sperm of a fish as food).

white smoker = a vent in a geologically active area of the ocean floor. Superheated water laden with light coloured minerals (barium, calcium, and silicon) supports an ecosystem including fishes. See also hydrothermal vent and black smoker.

white spot = 1) ich (a contagious disease of aquarium and hatchery freshwater fishes, caused by a large protozoan (*Ichthyophthirius multifiliis* or *I. hoferi*) and characterized by small white to greyish pustules on the skin and eyes, the encysted mature parasite. Fish become hyperactive, show flashing and may cut themselves on sharp objects as the parasites cause irritation. Severe infections cause respiratory problems and death. Various chemical additives such as malachite green, formalin and methylene blue can be used to treat the aquarium water. Removal of fish from the aquarium will interrupt the parasite life cycle as encysted trophozoites settle to the aquarium bottom and divide into tomites or theronts which re-infect fish skin. Also called white spot and ichthyophthiriasis).

white spot = 2) cryptocaryon (a ciliated protozoan parasitic infection of marine fishes in aquaria caused by *Cryptocaryon irritans*. White spots develop on the body and fins and fish will scratch themselves against rocks. Gills may become infected and respiration affected).

white spot = 3) formation of crystals of disodium hydrogen phosphate on stale, raw, dried, salted white fish stored in very dry conditions.

white water = 1) frothy water in rapids, breakers or waterfalls.

white water = 2) seawater with a light colour as it is over a sandy bottom.

white water = 3) almost opaque fresh water caused by tannins and suspended minerals, e.g. in the Amazon River.

white wings = dried salted and split cod with the dark peritoneum removed.

White's method = 1) estimation of the number of individuals based on remains, e.g. in an archaeological sample of fish vertebrae, the observed sample frequency ( $O$ ) and expected frequency (weighted mean)( $E$ ) are obtained for various types of vertebrae (atlas, thoracic, caudal, etc.) and the minimum number of individuals is obtained from  $\Sigma(O/E)/N$ .

White's method = 2) determining the size of fish, or amount of flesh furnished, from archaeological remains using the average size of an individual of a particular species, based on fishery data and the ratio between bone and flesh weights. See also Cook and Traganza method.

white-salted herring = herring cured by gutting and packing in thick brine and left until finally packed in fresh lime and salt.

whitebait = 1) the young of various fishes, especially the herring, considered a delicacy when fried. Often the fish are transparent.

whitebait = 2) any of various similar or related small edible fishes.

whitebait = 3) a piece of fish on a hook.

whitebait = 4) common name for *Galaxias maculatus* (Galaxiidae) and *Salangichthys microdon* (Salangidae).

whitebait stage = the pelagic juvenile stage of some Galaxiidae with marine or lacustrine phases in which the body is elongate and transparent.

whitelng = whitling.

whitenape = white nape.

whitewater (adjective) = 1) frothy water in rapids, breakers or waterfalls.

whitewater (adjective) = 2) seawater with a light colour as it is over a sandy bottom.

whitewater (adjective) = 3) almost opaque fresh water caused by tannins and suspended minerals, e.g. in the Amazon River.

whiteworm = worms of the genus *Enchytraeus*, cultured in containers of damp potting compost and fed on oatmeal, soaked bread or a special whiteworm food. Used as aquarium food for medium-sized fishes. Whiteworms are fairly large (3cm) earth-dwelling oligochaetes living in damp soil rich in decaying organic materials.

whiting = 1) a common name for several species of fishes, e.g. *Semotilus corporalis* (Cyprinidae), *Merluccius bilinearis* (Merlucciidae), *Theragra chalcogramma* (Gadidae).

whiting = 2) precipitation of calcium carbonate in hard water lakes during early summer. Chalky white clouds form and calcium carbonate rains down on the lake bed, consolidating to form marl in some cases. Temperature-dependent reduction in carbonate solubility and a seasonal change in pH related phytoplankton growth are cited as the causes. Whittings are visible on satellite images of the North American Great Lakes.

whiting's eye = an amorous glance (slang).

whitling = a juvenile salmonid during its marine phase, returning for the first time to fresh water (Scottish dialect). More commonly the term grilse is used. Also spelled whiteling and whittering.

whittering = whitling.

who cries stinking fish? = who would deprecate his own abilities or his own goods?

whole fish = fish as caught without any treatment or removal of parts. May refer to gutted fish in contrast to fillets.

whole meal = press cake (*q.v.*) mixed with condensed fish solubles (*q.v.*) and dried.

whutter = witter.

wicker trap = a fish trap of wicker used for catching eels.

widder = witter.

wide gap = wide gape.

wide gape = in reference to angling hooks, those having a wide distance between point and shank. This enables large baits to be placed on the hook but leave the point free to hook the fish.

width of = see .....width.

widyan = plural of wadi, although the anglicised form "wadis" is usually seen.

wiener = a fish wiener is a smoked fish sausage. Also spelled weiner.

Wiener Linie = 2.195 mm (used in older taxonomic works in Austria). But see also Linie.

Wiener Zoll = 26.34 mm (used in older taxonomic works in Austria). But see also Zoll.

wild = living in nature.

wild fish = undesirable fish species in an aquaculture operation, economically unimportant and in competition with desirable fish.

wild fishery = a fishery based on fish caught in the wild, rather than cultured in a farm operation. Also called capture fishery, q.v.

wild population = a population that is sustained by natural spawning and rearing in the natural habitat, with no assistance from hatcheries.

wild spawning = an aquaculture term for uncontrolled spawning.

wild stock = a stock that is sustained by natural spawning and rearing in the natural habitat, regardless of parentage or origin.

wild type = the form of an organism that occurs most frequently in nature.

wild-caught fish = as opposed to farmed fish, those fish caught from natural waters.

Wilder's organ = paired serrated appendages in the gill chamber attached to the isthmus by connective tissue and some sternohyoideus muscle fibres in *Amia* (Amiidae). It is supported by bone and equipped with tooth-like structures. Function unknown.

William Beukel = a fourteenth century Dutchman reputedly the first to pickle fish, hence pickle from his name (unlikely as pekel exists in medieval Dutch). Also spelled Bukelz.

willowleaf blade = in angling, a spinner or spoon blade shaped like a willow leaf, elongate and with a pointed tip, flashier and used more in vegetation and clear water than some other types.

winch = any powered or unpowered machine having horizontally mounted drum on which a rope or net can be wound.

winch barrel = barrel of winch on to which the warp is wound. Since nets have two warps or ropes, trawlers will have two separate winch barrels which can be worked together or separately.

winch head = warping end.

wind dried fish = fish dried by the action of wind; air dried.

wind knot = a loop formed in the process of casting a fly line, usually by beginners and made worse when casting in the wind (hence the name), and becoming a knot. The loops form particularly in the leader or tippe Occurs when the rod tip dips under the straight line path, usually the result of a jerk forward at the end of the backcast.

wind lane = a calm area in a lake or river where surface food items accumulate with the fish that feed on them. Visible as a ribbon or lane of calm water.

wind on wire leader knot = a knot used by anglers to connect plastic-coated wire to line and enable it to be wound up through rod guides. Various websites have animated steps showing how to tie this knot.

windfall gain = a benefit realised without sacrifice, e.g. obtained by a fisherman's selling his fishing privilege. Also called windfall profit.

winding = the threads used to attach the runners and guides on a fly or other fishing rod.

window fishing = theft by entering a house through the window (slang).

windows = armouring (the outer wall of large mesh netting forming part of a trammel net, *q.v.*. Also called outer net, outer wall, outwall, outwalling, trancher, wall, walling).

winding = thread wraps used to attach stripping guides and snake guides on a fly rod blank.

window = a clear area, e.g. in species with a light organ a patch of skin without scales, e.g. in Macrouridae.

windshark = the area on the window of car not reached by either wiper blade.

windward = 1) on the side exposed to the wind.

windward = 2) the direction from which the wind is coming.

windward = 3) away from the wind. Used to describe geographical positions where fish are caught or are absent. See also leeward.

wing = 1) the enlarged pectoral fin joining to the head and body found in Rajoidei.

wing = 2) a tapered net section extending forward from either side of the main body of a trawl.

wing = 3) tapered net section at the opposite end from the bunt of a purse seine.

wing = 4) belly flap (a loose piece of skin and flesh hanging from fish ribs in fish preparation). Also called lug or lug flap.

wing = 5) bait cut from the belly of a fish near the gills.

wing net = fyke net (a bag-shaped, cylindrical or cone-shaped fish trap, mounted on rings, with funnels which direct the fish into successive compartments. The net is fixed in place by stakes or anchors. Fish are deflected towards the mouth of the bag by leader nets set obliquely on either side of the mouth. Used particularly in rivers).

wing tip = the point where adjacent breast lines, *q.v.*, intersect or where a breast line intersects with the fishing line.

wingwall = a retaining wall parallel to a stream.

winter fish = fish such as ling kept in pickle during the winter (Scottish dialect).

winter pond = an earthen pond up to 2.5 metres deep with a relatively high flow rate ensuring adequate oxygen supply even if it ices over. Used by carp producers in colder climates.

winter race = semi-anadromous (*q.v.*) fish that move into rivers in autumn as overwintering there is less stressful and energy-consuming for a freshwater fish. They often spawn earlier in spring and further upstream than non-anadromous or sedentary stocks. See also spring race.

winter resistance = the ability of fish, particularly fry, to survive winter conditions.

winter sleep = hibernation (overwintering in a torpid state).

winter-run fish = anadromous fish that migrate to fresh water in fall or winter and spawn in late winter or spring.

wintering = a migration of fish to a winter site away from feeding and spawning areas.

wintering pond = a pond for overwintering fish, e.g. second year carp.

winterkill = the death of fishes in enclosed water bodies during winter owing to oxygen depletion. Snow and ice cover prevent oxygen exchange through the water surface and the breakdown of organic matter on the bed of the pond and in the water column also uses up the oxygen.

wip = a hair-line by which a fish-hook is attached to a small line or snood, which in turn is spliced on to the back or principal line used in fishing haddocks.

wire basket = a fish trap made of wire or wire mesh.

wire lining = using a metal line to present lures when trolling.

wire net = a cone-shaped net with a two inch or more stretched mesh over a wire frame of five inch mesh to support the netting. Used in Louisiana.

wire trace = a wire connecting a lure or baited hook to the main fishing line. Used for fish with sharp teeth.

wirlin = a not fully grown trout or salmon (Scottish dialect). Also spelled wirling, wurlin and variants.

wirling = wirlin.

Wisconsin bank cover = an artificial ledge of wood supported by rock along a stream margin as cover for fish.

wisp = 1) a collective noun (a noun that denotes a collection of persons or things regarded as a unit) for eels.

wisp = 2) a bundle of fish tied together with a wisp of straw or other like material (Scottish dialect). Also spelled wusp.

wither = witter.

withdrawal period = the time between cessation of any drug treatment of fishes in an aquaculture facility and slaughter so no hazard is passed along to a consumer.

witter = the barb of a fish hook, spear or gaff (Scottish dialect). Also spelled wutter, wither, widder and whutter.

wobbler = spoon (a lure that is spoon-shaped, with a hook(s) at one end, and that is cast out and retrieved in sport fishing. It flutters when drawn through the water. Numerous sizes, shapes and colours available).

wobbling = retrieval of a lure cast out a long way in an erratic fashion with side-to-side movements of the rod tip and varying retrieval speeds.

Wolffian duct = the mesonephric duct into which urine drains from the mesonephric tubules and which also serves in many fishes for sperm transport. In females these ducts open into the urogenital sinus.

wonky hole = a submarine freshwater spring on the seabed in the Great Barrier Reef, Queensland, Australia. Attracts fish and fishermen but irregular coral reef growth often destroys nets.

wood smoke = a mixture of chemicals from burning wood used to flavour and preserve fish in a smokehouse. A preservative effect is attained from phenolic compounds, formaldehyde and acids. Aliphatic and aromatic vapours contribute flavours.

Worcester sauce = the generic name for Worcestershire sauce.

Worcestershire sauce = a sauce made with vinegar, molasses, chilli peppers, soy sauce, corn syrup, black pepper, tamarinds, onions, shallots, cloves, asafoetida and garlic and, the

ichthyological ingredient, anchovies. Used on many dishes, particularly beef, but also an ingredient of Caesar salad and Bloody Marys. This is the trade name, *cf.* Worcester sauce.

word compound = compound (a word or scientific name formed from two or more words combined excluding prefixes and suffixes, e.g. *novaezealandiae*).

work = 1) in the International Code of Zoological Nomenclature, any text whether published, unpublished, or carrying a disclaimer containing a name or other information bearing on nomenclature; an anonymous work is a published one where the name(s) of its author(s) cannot be determined from the contents of the work; an available work is a published one in which under the provisions of the International Code of Zoological Nomenclature, or by a ruling of the International Commission on Zoological Nomenclature, names or nomenclatural acts may be established; a conserved work is one that the Commission has ruled to be an available work; a rejected work is any work included by the Commission in the Official Index of Rejected and Invalid Works in Zoological Nomenclature; a suppressed work is any work that the Commission has ruled to be unpublished or unavailable; an unavailable work is a published work in which, under the provisions of the Code, or by ruling of the Commission, names or nomenclatural acts cannot be established; an unpublished work is a work that is not published within the meanings of the Code or which the Commission has ruled to be treated as unpublished.

work = 2) any written information such as a manuscript or a publication.

work = 3) any structure or impression resulting from the activity of an animal but not part of an animal, e.g. burrows, nests, etc.

work = 4) of fish, to be on the move.

work of an animal = result of the activity of an animal, but not a part of an animal nor a mold, impression or replacement of an animal, e.g. a coprolite; trace fossils.

workhorse run = the Sacramento River fall run of chinook salmon (*Oncorhynchus tshawytscha*), so-named because of its abundance (at least in the past).

working end = the part of a line actively in use when tying a knot; the opposite end is the standing end.

working fecundity = free and ripe ova in a female, i.e. eggs ready to be shed.

working paper = rough notes and calculations used to prepare a final document such as a research paper.

working sheet = an informal document used to record basic museum catalogue information for an eventual permanent record.

world ocean = all the sea waters of the Earth regarded as one ocean. Also called global sea.

worm = to fish with worms.

worm cataract = a parasitic eye disease of fish caused by larval trematodes (*Hemistomum spathaceum*) between the lens and the lens capsule.

worm charming = worm grunting.

worm dapping = touching a worm to the water surface immediately over where a fish lies, using a short piece of line on a long rod. Used for trout.

worm fishing = fishing with worms as bait.

worm grunting = driving worms to the surface of the ground to be caught and used in angling. A wooden stake driven into the ground is rubbed with a piece of metal, producing vibrations reminiscent, to the worms, of the digging sound of an approaching mole. Worms are desperate to escape voracious mole and come onto the surface of the ground where the moles rarely go. Simply banging the ground surface will also work. Also called worm charming, snoring or tickling.

worm itch = gyro (a parasitic infestation of fish caused by the trematode *Gyrodactylus*).

worm rig = a specialised combination of hooks, weights and plastic or live worms.

worm snoring = worm grunting.

worm tickling = worm grunting.

worm track = vermiculation, e.g. one of a series of wavy markings on the back of such fishes as the brook trout, *Salvelinus fontinalis*.

worming = fishing with a worm or similar bait, usually referring to a technique using only a worm on a hook.

wormy = 1) infested with parasitic worms.

wormy = 2) a disease of the musculature of halibut from cysts of Myxosporidea such as *Unicapsula*.

Worshipful Company of Fishmongers = a livery company (trade association) of the City of London with a royal charter dating back to the thirteenth century. It had a monopoly over sale of fish in the City and now inspects all fish sold.

wounding gear = grappling gear (fishing gear that wounds or kills fish rather than trapping them, e.g. harpoons, spears, arrows, etc.).

wraike = to sort fish in order to reject damaged ones.

wraiker = a person who examines fish for defects.

wrake = wraike.

wraker = wraiker.

wrap = one complete revolution of line around another; when tying a knot. Also called a turn.

wrapping = impounding a school of fish.

wreck buoy = a buoy with red and black horizontal stripes used to mark a wreck.

wreck fishing = angling for fish over or near a sunken ship that provides habitat for fish in an otherwise less diverse environment.

wurlin = wirlin.

wusp = wisp (2).

wutter = witter.

Wye lead = an anti-kink, *q.v.*, device used in fast water.

## X

x = 1) times, multiplied by.

x = 2) in nomenclature, used to indicate hybrids between two species with the female parent's scientific name first, e.g. in a hybrid formula *Rutilus rutilus* x *Abramis brama*.

X diameter = a measure of the diameter of leader and tippet material in angling. 0X is the largest at 0.011 inches and 8X is a small diameter at 0.003 inches. Strength varies with the type of material used, not necessarily the diameter. The diameter in thousandths of an inch is calculated by subtracting the number before the X from 11. Originally a leader was made of cat gut extruded from a machine at 0.011 inches; successive extrusions tapered it down so one additional extrusion gave the 1X or 0.010 inch diameter, and so on.

X-Y bone = an accessory bone in the caudal fin of such fishes as Phycidae. Found anterior to the neural and haemal spines of the first preural centrum, helping support secondary caudal fin rays.

xanthic = having a yellow pigmentation.

xanthin = a yellow pigmentation occurring in nature and aquarium bred fish often giving a gold colour, e.g. the midas cichlid or yellow devil (*Amphilophus citrinellus*) and the aquarium variant of the severum cichlid (*Heros severus*).

xanthism = having a yellow pigmentation.

xanthochromic = of a yellow or golden colour, a common mutation in aquarium fishes.

xanthophore = a yellow chromatophore. The pigment involved is a carotenoid and the cell is neural-crest derived.

XBT = abbreviation for an expendable bathy-thermograph, an instrument that records water temperature with depth.

xebec = a small, three-masted vessel used by Mediterranean pirates and still used in commerce to a limited extent. From the Arabic shabbak. Also spelled zebec or chebec.

xerography = production of copies by a commercial electrostatic process. Printed material treated this way is called a photocopy or a xerox and is a convenient means of building up a library on fishes for scientific study as originals are out-of-print or too expensive to buy. Fish specimens can also be "copied" this way and the compressed species at least make reasonable images for publication or reference.

xerophil = a reproductive guild (*q.v.*) found in annual fishes, where embryos survive without water for months in intermittent pools, hatching when the pool floods. In the cleavage phase blastomeres disperse and rest in a facultative diapause followed by two more obligate resting intervals, e.g. *Nothobranchius guentheri*.

xerotype = in nomenclature, an unofficial term for a type normally stored in fluid that has dried up. Deliberately dried skins of fishes and stuffed skins might be called this.

xinchin = a fermented fish sauce made with citrus juice and chillies in the Yucatan, Mexico.

xiphi- (prefix) = shaped like a sword.

xylophagy = wood-eating, found in environments containing little in the way of alternative food sources, e.g. in such loricariid catfishes as *Panaque* and *Cochliodon*.

xyphosis = dorso-ventral curvature of the vertebral column.

## Y

$Y_s$  = maximum sustainable yield (the average or maximum catch that can be removed under existing environmental conditions over an indefinite period without causing the stock to be depleted, assuming that removals and natural mortality are balanced by stable recruitment and growth. Abbreviated also as MSY. Also called maximum equilibrium catch, maximum sustained yield, sustainable catch).

Y/R = abbreviation for yield-per-recruit (the expected lifetime yield-per-fish of a specific age, e.g. per age 2 individual. For a given exploitation pattern, fishing regime, rate of growth and natural mortality, an expected equilibrium value of Y/R can be calculated for each level of fishing mortality (F)).

Y-piece = extension piece (tapered sections of netting between the belly and the batings and the cod end of a trawl. Also called pipe, swallow piece, tail, tail piece, taper).

ya = abbreviation for years ago.

yaag = 1) to keep a hand line in constant motion to attract fish to the bait (Shetland Isles dialect).

yaag = 2) to buy up fish on the quiet which the seller is contracted to deliver to someone else (Scottish dialect). Also spelled yagg and jag.

yaager = yagger.

yaar = yair (2).

yaffle (noun) = 1) an armful of dried or nearly dried salt fish in Newfoundland, i.e. the amount that could be comfortably carried under one arm. Also a small yaffle could be as many fish as could be held in two hands together and a large yaffle what a man can gather in his two arms.

yaffle (noun) = 2) the name of a search engine at Memorial University, Newfoundland aimed at enabling public access to university projects and data. Taken from the Newfoundland word yaffle, and morphed into meaning an armload of knowledge.

yaffle (verb) = 3) to take up an armful of fish and referring to the work of spreading, gathering and piling fish.

yaffle at hand = call used by Newfoundland fishermen loading dried cod when a yaffle is gathered together.

yaffle up = yaffle at hand.

yag = a shoal of small and worthless fry (Scottish dialect).

yagg = yaag (2).

yagger = 1) jagger (a hawker of fish (archaic). See also jouster, jager, jaager and yaager).

yagger = 2) a tender for the Dutch herring fleet off Shetland, bringing stores from Holland and carrying the fish catch home.

yair = 1) a fish lock such as a mill dam (Durham dialect).

yair = 2) a curved enclosure of stones or stakes wattled with twigs and brushwood built on the shore or a river bank, trapping salmon as the tide recedes. Some are named, e.g. Rutyare, Maleyare (British dialect). Also spelled yaire, yaar and yare.

yaire = yair (2).

yakiboshi = a fish product dried after boiling or toasting. It is usually gutted and skewered with bamboo pins or in some cases split fish or slices are used. Usually combined with the name of the fish as a suffix (Japan).

yalla cod = smoked cod (Scottish dialect).

yamabuki = ornamental carp or koi (*q.v.*), being a yellow metallic fish.

yard = 0.914 m. Abbreviated as yd.

yard seine = beach seine (a net used to encircle fish in shallow water; usually operated by two people wading out from shore, the net has lead weights to keep the bottom on the sea floor and floats to keep the top of the net at or near the surface; there may be a bag extending back from the centre of the nets length to increase capture efficiency. The seine may be set from a boat but hauled in from the land. Also called shore seine, drag seine, draw net, haul seine and sweep net).

yare = yair (2).

yarkin(g) = fish biting freely.

yarkin (g) = 2) a line passed through the meshes of a fish-net and fastened to the rope attached to floats which suspend the net in the water (Newfoundland).

yarkin(g) mesh = that part of a fish-net which is fastened to the head-rope (Newfoundland).

Yarmouth bloater = 1) a red herring, *q.v.*

Yarmouth bloater = 2) an inhabitant of Yarmouth (Peggotty in Dickens' David Copperfield).

Yarmouth capon = a red herring. See also capon.

yarn = netting in the main body of a drift net (east Scotland).

yaw = rotation of a swimmer around its vertical or dorso-ventral axis.

yawl = a two-masted fore-and-aft-rigged sailing vessel similar to a ketch but having a smaller jigger- or mizzenmast stepped abaft the rudder.

yawling = 1) herring nets allowed to drift with the tide (Kentish dialect).

yawling = 2) small herring (*Clupea harengus*).

yawning = seen in some aquarium fish and appears to be a response to poor water quality and possibly gill disease or parasitism.

ybp = years before present.

yd = abbreviation for yard (0.914 m).

YE or  $Y_E$  = the yield in weight taken from a fish stock when it is in equilibrium with fishing of a given intensity, and (apart from effects of environmental variation) its biomass is not changing from one year to the next (Ricker, 1975). Also called sustainable yield, equivalent sustainable yield.

year brood = year class.

year class = all the individuals of a population of fishes born or hatched in the same year, e.g. 1995. After this brood is recruited to the fishery it appears year after year until all its members

die, and is referred to as the 1995 year class throughout its life. Also called brood, year brood, cohort or generation. In the northern hemisphere where spawning occurs in fall and hatching in spring, the calendar year of the hatch is commonly used to identify the year class, except usually for salmonids (Ricker, 1975). The biomass of a year class initially increases as fish grow, reaches a peak at a certain age depending on the species, food availability and mortality, and then starts to decrease as fish die off and growth slows.

year mark = marks appearing on growing structures of a fish, such as bones, scales, otoliths, etc. These marks can be used to interpret the annual or daily growth, age, spawning time, etc,

year-class effect = the common domination of a species population by individuals recruited in one reproductive season.

year-round fishery = a fishery carried out throughout the year, without cessation.

yearling = a member of age-group I, in the second calendar year (Hubbs, 1943). May also refer to a fish about one year old or to fish 1-3 years old.

yeel couple = the fish allotted to each member of a family as a Christmas treat (Scottish dialect, from yule).

yeel fish = usually a smoked haddock, a special delicacy at Christmas (Scottish dialect. from yule).

yellow cure = Portuguese salt cod with some of the salt removed by soaking in water between stages of washing and drying, yellowish in appearance. Also called amarelo cure.

yellow fish = smoked fish, especially cold smoked white fish.

yellow grub = an infestation of fish with the metacercariae of *Clinostomum marginatum*, a digenetic trematode.

yellow water = water in aquaria with a slight yellowish tinge usually indicative of too much organic material. Can be removed by carbon filtration.

yield = 1) catch in weight. Catch and yield are often used interchangeably. Amount of production per unit area over a given time. A measure of production. The sustainable yield is the quantity of fish which can be taken from a stock (usually on an annual basis) without severely depleting or eliminating that stock.

yield = 2) the amount of product obtained from raw fish material. The edible yield of fish from skinless fillets is about 40%, varying with species, size, season, condition, etc.

yield curve = the relationship between the expected yield and the level of fishing mortality or fishing effort.

yield-per-recruit = the expected lifetime yield-per-fish of a specific age (or the average recruit), e.g. per age 2 individual. Abbreviated as Y/R. For a given exploitation pattern, fishing regime,

rate of growth and natural mortality, an expected equilibrium value of Y/R can be calculated for each level of fishing mortality (F).

yield-per-recruit analysis = analysis of how growth, natural mortality, and fishing interact to determine the best size of the fish at which to start fishing them, and the most appropriate level of fishing mortality. The yield-per-recruit models do not consider the possibility of changes in recruitment (and reproductive capacity) due to change in stock size. They also do not deal with environmental impacts.

yo-yo = 1) retrieval of a lure by a straight up-and-down movement from the bottom to the top, enticing a fish to strike.

yo-yo = 2) a very small haddock, derived from the appearance and the movements of the fish on the hook (slang at Lossiemouth, Scotland).

yo-yo winch = a type of winch used on deep-sea stern trawlers. A winch is mounted near the stern ramp on each side and they are used for shooting the net away and for emptying the cod end.

yoke = dan leno stick (a ballasted wood pole with short rigging ropes attached, functioning like the dan leno bobbin).

yoke hoop = dan leno hoop (a hoop-shaped dan leno made of bent wood with short rigging ropes wired to the outer circumference. Also called dan leno ring, geer, hoop, hoop bridle, round dan leno and yoke hoop).

yoke stick = dan leno stick (a ballasted wood pole with short rigging ropes attached, functioning like the dan leno bobbin).

yoked key = indented key (a dichotomous key in which the first part of a couplet is followed by all subsequent couplets. Each subordinate couplet is indented to the right for reasons of clarity; not much used in ichthyology).

yolk = granules of semi-crystalline phospholipoprotein used as a nutrient store during embryonic development.

yolk ball = the anterior round region of the yolk cell present after the yolk extension forms during the segmentation period.

yolk cell = a giant syncytial uncleaved cell containing the yolk. It underlies the blastodisc early in development and becomes enveloped by the blastoderm during epiboly.

yolk extension = the posterior elongated region of the yolk cell that forms during the segmentation period.

yolk granule = a membrane-bounded sac containing yolk. These 50 µm granules are densely packed in the interior of the yolk cell and make up most of the cell.

yolk plug = yolk within the blastopore.

yolk sac = a sac containing yolk used for nourishment in larval fish.

yolk stripe = a series of melanophores along the median ventral aspect of the yolk ball and particularly the yolk extension.

yolk syncytial layer = a peripheral layer of the yolk cell including nuclei and non-yolky cytoplasm.

yolk-sac larva = a fish larva which has already hatched from the egg but has not started feeding yet and still absorbs the yolk in the ventrally attached yolk sac. At the end of this stage in development, the yolk and oil globule(s) have been used up, the major organ and sensory systems required to capture and digest prey are functional, and the primordial pectoral fins are present.

yolk-sac placenta = the yolk-sac helps in formation of a placenta which allows a connection of the embryo to the mother for nourishment.

yook = hook (northeast England).

yorking = yarkin (g).

"you fish your side of the water, I fish my side of the water, nobody fishes the middle" = Chargoggagoggmanchauggagoggchaubunagungamaugg, the Algonquin name of a lake in Webster, Massachusetts, incorrectly said to have this meaning. Really means "Englishmen at Manchaug at the Fishing Place at the Boundary". Longest place name in the United States.

young = a term loosely applied, because any precise distinction involves age determination, to immature fishes.

young-of-the-year = members of age group zero, from transformation to juvenile until January 1 in the Northern Hemisphere or July 1 in the Southern Hemisphere (Hubbs, 1943).

younger synonym = junior synonym (the junior synonym is that with the later publication date of two or more different names applied to one and the same taxon).

youthful river = a river having a steep gradient, few tributaries, rapid flow and its channel eroded deeper than wider. See also mature, old and rejuvenated rivers.

YOY = abbreviation for young-of-the-year.

yr = year.

yrs = years.

## Z

Z = total mortality rate (the number of fish which die during a year or season, divided by the initial number. Also called actual mortality rate, coefficient of mortality. Instantaneous rate of mortality (the natural logarithm (with sign changed) of the survival rate. The ratio of number of

deaths per unit of time to population abundance during that time, if all deceased fish were to be immediately replaced so that population does not change (Ricker, 1975). Also called coefficient of decrease).

$z$  = instantaneous rate of recruitment (number of fish that grow to catchable size per short interval of time, divided by the number of catchable fish already present at that time. Usually given on a yearly basis, i.e. the figure just described is divided by the fraction of a year represented by the short interval in question. This concept is used principally when the size of the vulnerable stock is not changing or is changing only slowly, since among fishes recruitment is not usually associated with stock size in the direct way in which mortality and growth are (Ricker, 1975)).

$Z'$  = disappearance (the rate of decline in numbers of fish caught as fish become less numerous or less available. Often calculated from catch curves).

$z$ -value = in food inspection, the number of degrees needed for a specific thermal death time curve to pass through one log cycle (factor of 10). Different microorganisms have different  $z$ -values depending on their resistance to changing temperatures.

*zavinac* = rolled up pickled herring, the term used for the @ sign in email addresses in Slovakia and the Czech Republic.

zebec = xebec (a small, three-masted vessel used by Mediterranean pirates and still used in commerce to a limited extent. From the Arabic shabbak. Also spelled chebec).

zebrafish = *Danio rerio* (formerly *Brachydanio rerio*), a member of the Cyprinidae used to study vertebrate biology, physiology, genetics, developmental biology, neurology and human disease. It has a short generation time, is highly fecund, fry are transparent, and many mutants with features resembling human diseases have been identified.

zentner = centner (50 kg).

zeolite = an ammonia-removing, ion-exchange mineral used in freshwater aquaria. It also can act biologically and mechanically. Does not last long and must be regenerated by soaking in a strong salt solution for a day. Particularly useful for temporary ammonia problems, in hospital tanks where the chemicals are harmful to biological filters and in transporting fish on long journeys.

*zhirovaya* = watery or mushy caviar taken from sturgeons before they are ready to spawn.

*zig rig* = in angling, a rig used for presenting floaters, *q.v.*, which rise up from a bottom weight.

*zigzagging* = using a boat in a controlled fashion to troll a lure in a weaving pattern, imparting an erratic action to the lure to avoid spooking shallow fish. Also called snake trolling.

*zipper* = 1) the opening edge along the upper forward seam of the cod end of a mid-water trawl facilitating removal of fish.

zipper = 2) a structure for lifting the leadline of a purse net to the surface in order to divide a large catch or to isolate a small catch.

zipper = 3) an item of dress often found open in drowned male anglers fishing from a small, unstable boat.

zipper worm = in angling, a plastic worm with a flat but ridged body (like a clothes zipper).

zipperlip = angling slang for a secret fishing hole.

Zmbp or  $Z_{MBP}$  = abbreviaton for level of total mortality at which the maximum biological production is obtained from the stock.

Zoll = 26.15 mm in Germany; the Wiener Zoll = 26.34 mm in Austria. Both may be used in older taxonomic works.

zombie = a reanimated corpse in folklore and popular books and films. Purportedly based in fact, zombies could be made by dosing humans with tetrodotoxin (*q.v.*) from pufferfish combined with the plant *Datura*. However tetrodotoxin does not have the zombie effect (lack of will, trance-like state and stumbling gait) and the claim is generally discredited.

zona radiata = a thickened, rather complex egg membrane of teleost fishes, which often has a radiate appearance. It is formed at the surface of the egg by the ooplasm, or the ooplasm and the follicle cells and hence should be regarded as a true vitelline membrane. May be overlain by the chorion, *q.v.* In Elasmobranchii the zona radiata underlies or overlies a homogeneous vitelline egg membrane.

zonation = a distinct animal and plant community. Often refers to zonation on a sea shore where fishes, for example, are found at different levels of tidal influence and associated with different plant communities.

zone = 1) a region of similar structure or optical density laid down during growth of hard parts used in ageing. Also called band, mark and ring although zone is preferred.

zone = 2) a fishing zone is a zone of variable width (up to 200-nautical-miles) proclaimed by a coastal State around its coast, within which it controls domestic and foreign access to fish resources.

zone = 3) an area of rocky shore, reef flat, mangrove swamp, etc. that has distinct animals and plants.

zonolimnetic = pertaining to a particular depth zone in a lake

zoobenthivore = feeding on zoobenthos.

zoobenthos = animals living on or in the bottom of the sea or fresh waters.

Zoological Commission = International Commission on Zoological Nomenclature (*q.v.*).

zoological formulae = modifications of available names throughout a taxonomic group by the addition of a standard prefix or suffix in order to indicate that the taxa named are members of that group. Zoological formulae are excluded from the provisions of the International Code of Zoological Nomenclature. The suffixes of family-group names denote ranks, not taxonomic groups, and do not form zoological formulae.

zoological Latin = the language used in nomenclature derived from Renaissance Latin, and some Greek, the spelling and grammar following Latin as this is a dead language not open to change and therefore universally useable.

zoological name = the scientific name of an animal taxon in binominal nomenclature.

zoological nomenclature = the system of scientific names for animal taxa and the provisions for the formation, treatment, and use of those names.

Zoological Record = a published and online index of zoological literature started in 1864. The Pisces section covers fishes.

zoological taxon = a natural taxon of animals, named or unnamed.

zooneuston = the animal component of the neuston.

zooneustont = an animal of the neuston.

zoonosis = an infectious disease of animals, including fishes, that can be transmitted to humans, e.g. fishkeeper's granuloma or fishtank granuloma, an infection in humans with the bacteria causing fish tuberculosis (a *Mycobacterium*, but not the same as the one causing human tuberculosis). It is probably the only zoonosis of note to aquarists. It appears as a skin infection, usually on the hands or forearms where there was an earlier cut, and may be inflamed, suppurating, encrusting and irritated. Not usually serious unless the infected individual is already immunosuppressed. Treatment requires antibiotics.

zoophagus = eating animals or animal matter.

zoophagy = feeding on plankton and benthos, relatively small animals.

zooplankter = an animal of the plankton.

zooplankton = plankton (*q.v.*) comprised of animals, *cf.* phytoplankton.

zooplanktont = an animal of the plankton.

zootaxa = plural of zootaxon.

zootaxon (plural zootaxa) = a taxon of animals.

Zoug jar = Zouger jar.

Zouger jar = a bottle for the incubation of fish eggs with water flow upward to maintain eggs in suspension for adequate oxygenation. The outlet may have a fine meshed grid to prevent loss of larvae. Also called Zoug jar.

zulu = 1) an artificial fly used on lakes on dark days in Britain; for trout and sea trout.

zulu = 2) a type of fishing-boat common on the Moray and Clyde Firths, Scotland, in the late nineteenth century with fore- and mizzen-masts, a straight prow and a markedly raked stern. Some models were later fitted with engines.

zulu skiff = a smaller type of zulu, generally with only one mast.

zygapophysis = articular process that extends forward and backward of neural arches and help to strengthen the union between vertebrae.

zygote = the fertilised egg.

## Abbreviations

The abbreviations given below can also be found in the letter files, placed as though each was a word.

A = acre ( $4046.9\text{ m}^2$ , 0.405 ha,  $43,560\text{ ft}^2$ ,  $4840\text{ yd}^2$ ,  $0.00156\text{ mi}^2$ ).

A = anal fin (rays).

A = annual total mortality rate (the number of fish which die during a year divided by the initial number. Also called actual mortality rate, coefficient of mortality (Ricker, 1975)).

a or a = *annum*, meaning year. Usually used in combination, e.g. Ma, meaning million years.

a- (prefix) = lacking, absence of, not.

A-ft = acre-foot (one acre of surface covered with 1 foot of water ( $1,233,500\text{ L}$ ,  $1233.5\text{ m}^3$ ,  $325,850\text{ gal}$ )).

A1 = first anal fin (rays).

A2 = second anal fin (rays).

A30 = number of anal fin rays anterior to the 31st vertebra, e.g. in Carapidae.

A100 = number of anal fin rays anterior to the 201st vertebra, e.g. in Nemichthyidae.

ab = aberration (1) a term used to denote a class of individuals within a species. A name which explicitly refers to an aberration unequivocally treated as an infrasubspecific entity is unavailable, or (2) an aberrant fish, deviating from the usual or natural type in colour, form, behaviour, etc.

ABC = allowable biological catch (a term used by a management agency which refers to the range of allowable catch for a species or species group. It is set each year by a scientific group created by the management agency and is the subjectively estimated amount of catch of a given species from a given region. The agency then takes the ABC estimate and sets the annual total allowable catch (TAC)).

ad. = adult.

AC = a series of ventro-lateral photophores extending between a vertical at the anal fin origin and the end on the caudal peduncle. The AC row may begin posterior to the anal fin origin if it is offset from other ventro-lateral photophores.

ac ft = acre-foot (one acre of surface covered with 1 foot of water (1,233,500 L, 1233.5 m<sup>3</sup>, 325,851 gal.). Used to measure volumes of water used or stored, such as in reservoirs).

A.D. or AD = *anno domini*, or Year of the Lord, the Christian dating system. Common era or CE is used as a neutral version.

*ad int.* = *ad interim*, meaning for the present, provisionally.

ADC= apparent digestibility coefficient (the value for the food absorbed from diet and not excreted in faeces; nutrient ingested - nutrient egested/nutrient ingested).

ADF = acid detergent fibre (the carbohydrates in an aquaculture feed that are not solubilised by acid detergent. This plant material is not easily used by fish).

*adv.* = *advena*, alien, introduced.

af = acre-foot (one acre of surface covered with 1 foot of water (1,233,500 L, 1233.5 m<sup>3</sup>, 325,851 gal.). Used to measure volumes of water used or stored, such as in reservoirs).

*aff.* = *affinis* (related to but not identical with, affinity, relationship, sometimes misleadingly employed as a synonym for phenetic similarity (or akin to)).

AFO = number of vertebrae anterior to the anal fin origin, e.g. in larval fishes.

*al.* = *alii* or *aliorum*, meaning others, of others.

AM, am or a.m. = *ante meridiem* or before noon; the time before 12 noon.

ami = air miles, the straight line distance between two points used when describing a specimen collection locality.

ANC = acid neutralising capacity (the property of water that reacts with an acid; formerly alkalinity).

anon = anonymous (of a name, nomenclatural act or work whose authorship is not stated. Also where the identity of an author cannot be determined from the work itself).

Ant = a photophore at the anterodorsal margin of the orbit.

AO = a row of photophores along the base of the anal fin and lower side of the caudal peduncle (not including the Prc's at the base of the caudal fin) in Myctophidae. Usually divisible into AOa mostly above the anal fin base and AOp mostly on the caudal peduncle. In some older works AO refers to the antorbital photophores.

AOa = a row of photophores mostly above the anal fin base in Myctophidae.

AOp = a row of photophores mostly on the caudal peduncle in Myctophidae.

*ap.* = *apud*, meaning in the work of; used in citing the work of an author contained in another work.

Art. = an Article of the International Code of Zoological Nomenclature.

*ascri.* = *ascriptum*, meaning ascribed to.

ASPM = age-structured production model (a stock assessment programme based on a deterministic form of a stock-recruitment relationship, with non-equilibrium tuning of abundance indices).

*auct.* or *auctt.* = *auctorum*, meaning of authors. Used to indicate that a name is used in the sense of a number of subsequent authors and not in its different sense as established by the original author.

*auct. non.* = *auctorum non*, meaning not of authors, used when citing a misapplied name.

B = biomass (the weight, volume or energy of living material in a given area, sample, fraction such as spawners, stock or for one or more given species (species biomass) or of all the species in a biotic community (community biomass). In fisheries the weight of a fish stock or some defined part thereof (Ricker, 1975)).

B 20% B-virg = level of spawning stock corresponding to a fraction (here 20%) of the unexploited biomass. Virgin biomass is estimated as the point where the replacement line for F=0 intersects the stock-recruitment relationship or as the biomass from a spawning stock per recruit curve when F=0 and average recruitment is assumed.

B 50% R = the level of spawning stock at which average recruitment is one half (50%) of the maximum of the underlying stock-recruitment relationship.

B 90% R, 90% Surv = spawning stock corresponding to the intersection of the 90th percentile of observed survival rate (R/S) and the 90th percentile of the recruitment observations.

B<sub>0</sub> = virgin or unfished biomass (B zero). Rarely known. Using mathematical models, it is generally calculated as the long-term average biomass value expected in the absence of fishing mortality. In production models, B<sub>0</sub> is also known as carrying capacity. It is often used as a biological reference point in fisheries management.

BC, B.C. = before Christ. Used to designate years before the birth of Christ. Used in scientific dating for relatively recent events, e.g. fish remains in sub-fossil sites. Note there was no year 0.

BC = buoyancy compensator (buoyancy control device).

BCD = buoyancy control device (an expandable bladder in the form of an expandable vest used with scuba apparatus. It can be inflated with air from the scuba tank to increase buoyancy while diving and is used for resting, swimming or lending assistance to others under water. It is deflated by special air-dump valves or hoses. Also called a buoyancy compensator (BC)).

BCE = before the common era. Used to designate years before the birth of Christ in a non-Christian countries. Used in scientific dating for relatively recent events, e.g. fish remains in sub-fossil sites. Note there was no year 0.

B.P. = before present, conventionally before 1950 A.D. for dating.

bland FPC = bland fish protein concentrate (concentrate with lipids, odour and flavour removed under hygienic conditions (see fish protein concentrate)).

$B_{lim}$  = limit biomass, the minimum level of spawning stock biomass. Below this level there is a higher risk that the stock will suffer a severe reduction in productivity. See also precautionary approach,  $F_{pa}$ ,  $B_{pa}$  and  $F_{lim}$ .

Bloss = biomass at the lowest observed stock size.

$B_{MSY}$  = biomass at MSY (the long-term average biomass value expected if fishing at  $F_{MSY}$  (the fishing mortality rate which, if applied constantly, would result in maximum sustainable yield. Can be estimated from simple biomass-aggregated production models or from age-structured models that include a stock-recruitment relationship)).

BOD = biological oxygen demand, *q.v.* BOD5 is the amount of dissolved oxygen consumed in five days.

$B_{pa}$  = the precautionary spawning stock biomass, a higher level than  $B_{lim}$  (*q.v.*) to allow for uncertainties in assessment. See also precautionary approach,  $B_{lim}$ ,  $F_{pa}$  and  $F_{lim}$ .

BR (or Br) = 1) photophores along the lower jaw of Myctophidae; formerly called maculae branchiostegae by some authors, or 2) branchiostegal rays.

$B_{threshold}$  = minimum stock size threshold (the minimum size of the stock that is required to produce maximum sustainable yield, below which the stock would be considered overfished).

Bu = a photophore above the hind end of the upper jaw in Myctophidae. Formerly called macula buccae by some authors.

BWD = body weight daily (a measure of food requirement and/or uptake expressed as a percentage or as a decimal fraction).

C = 1) caudal fin (rays).

C = 2) Carboniferous, a period within the Paleozoic Era ca. 365-290 million years ago.

C = 3) the Roman numeral 100.

C = 4) Celsius, a measure of temperature on a metric scale used world-wide and by scientists. In North America and in older literature Fahrenheit is used. The conversion is  $^{\circ}\text{F} = (^{\circ}\text{C} \times 9/5) + 32$  and  $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$ . Usually presented as  $^{\circ}\text{C}$  or  $^{\circ}\text{F}$  but strictly  $3^{\circ}\text{C}$  is an actual temperature while  $3\text{C}^{\circ}$  is a range of three degrees.

c. = 1) *cum*, meaning with.

c. = 2) *circa*, meaning approximately, about.

c & s = cleared and stained ( a specimen with some tissues rendered transparent by various chemical treatments while others are stained to enhance their visibility. In fish osteological studies, the flesh is cleared with enzymes or potassium hydroxide and the bones stained red with alizarin red S and the cartilage blue with alcian blue).

C1 = principal caudal fin rays.

C2 = procurrent caudal fin rays.

C/E = catch per unit effort (an older term for the catch in numbers or weight taken for a given amount of fishing effort over time using specific gear, expressed as a ratio. Often considered an index of fish biomass or abundance. May be used as a measure of economic efficiency of fishing. Also called fishing success, availability, catch per effort. Also abbreviated as CPUE. The more recent form is catch/effort (C/f or Y/f) where C is catch in numbers, Y is catch in weight, taken by a defined unit of fishing effort, f).

CAGEAN = catch-at-age-analysis; the estimated number of fish caught, tabulated by fish age and year of capture, and by other factors such as gear or nation. Catch-at-age may be estimated on the basis of catch-at-size, using age-length keys or cohort slicing.

CE = common era, a non-religious way of expressing years in the calendar based on the years of the Christian era. Note there is no year 0 so the year before 1 CE (or 1 A.D.) is 1BCE (or 1 B.C.).

C<sub>E</sub> = equilibrium catch (the catch (in numbers) taken from a fish stock when it is in equilibrium with fishing of a given intensity, and (apart from the effects of environmental variation) its abundance does not change from one year to the next (Ricker, 1975). Also called sustainable yield, equilibrium yield).

Ce = photophore at the upper end of the gill cover where it meets the lateral line in Myctophidae. Formerly called maculae cervicis.

ca. = *circa*, meaning approximately, about.

cf., cfr. = *confer*, meaning compare (with). Used with scientific names to indicate a similarity to the named species without certain identification; a provisional identification due to a damaged specimen or other problems.

cfs-day = the volume of water represented by a flow of 1 cubic foot per second for 24 hours (equals 86,400 cubic feet, 1.983471 acre-feet or 646,317 gallons).

cfsm (cubic feet per second per square mile) = the average number of cubic feet of water per second flowing from each square mile of area drained by a stream, assuming that the runoff is distributed uniformly in time and area.

CHV = cyprinid herpesvirus 1 (one of the oldest known fish diseases found in cultured carp, other cyprinids, pike-perch and aquarium fishes. It is caused by *Herpesvirus cyprini*. Also known as carp pox, carp papillomatosis, epithelioma papulosum, and fish pox. Skin lesions appear as the water temperature drops in winter as small milky-white spots that merge and cover large skin areas).

CITES = the Convention on International Trade in Endangered and Threatened Species. Regulates trade in live and dead animals and plants in an effort to conserve those species in danger of extinction.

Cl = chlorinity, the total amount in grams of chlorine, bromine, and iodine contained in one kilogramme of seawater, assuming the bromine and iodine to be replaced by chlorine. Salinity in parts per thousand (‰) =  $1.80655 \times Cl (\%)$ .

cm<sup>3</sup> = cubic centimetre (0.0338 fl oz, 0.00211 pt, 1.0 mL).

CNS = central nervous system, the brain and spinal chord.

coll. = collector (a person or institution who finds and secures specimens). Abbreviation often occurs on labels and is scientific descriptions of species.

*comb. nov.* = *combinatio nova*, meaning new combination.

*comb. rev.* = *combinatio revivisco*, meaning combination revived when a combination is reinstated, e.g. from an earlier synonymy.

*comm.* = *communicavit*, meaning (s)he communicated.

*cons.* = *conservandum*, meaning to be conserved.

COR = coronal pore.

*corr.* = *correctus*, meaning corrected (by).

CPR = catch, photograph, release, a management tool for preserving angling stocks.

CPUE = catch per unit effort (an older term for the catch in numbers or weight taken for a given amount of fishing effort over time using specific gear, expressed as a ratio. Often considered an index of fish biomass or abundance. May be used as a measure of economic efficiency of fishing. Also called fishing success, availability, catch per effort. Also abbreviated as C/E. The more recent form is catch/effort (C/f or Y/f) where C is catch in numbers, Y is catch in weight, taken by a defined unit of fishing effort, f).

CPY = current potential yield (the catch that can be taken given the current resource abundance and prevailing ecosystem considerations).

CR = critically endangered (in the IUCN Criteria for threatened species, a taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future).

ctmax = critical thermal maximum (in fish exposed to a constant rate of heating, the temperature at which there is a loss of equilibrium or onset of muscle spasm).

ctmin = critical thermal minimum (in fish exposed to a constant rate of cooling, the temperature at which there is a loss of equilibrium or onset of muscle spasm).

cusec = cubic foot per second. Used outside North America where the equivalent is cfs.

CWT = coded-wire tag (a small (0.25 mm diameter x 1 mm length) wire etched with a distinctive binary code and implanted in the snout of a fish (usually a salmonid) for mark-recapture studies).

cwt = hundredweight (50.802 kg (long), 45.359 kg (short)). Abbreviated as cwt, long and cwt, short respectively.

CyHV-1 = cyprinid herpesvirus I or carp pox (one of the oldest known fish diseases found in cultured carp, other cyprinids, pike-perch and aquarium fishes. It is caused by *Herpesvirus cyprini*. Also known as carp papillomatosis, epithelioma papulosum, and fish pox. Skin lesions appear as the water temperature drops in winter as small milky-white spots that merge and cover large skin areas).

CyHV-2 = cyprinid herpesvirus II, a haematopoietic necrosis herpesvirus which affects goldfish and is closely related to carp pox or CyHV-1 and koi herpes virus or CyHV-3. A member of the family Herpesviridae as above.

CyHV-3 = cyprinid herpesvirus III, also known as koi herpes virus (KHV). This is a deadly virus affecting carp including koi. A member of the family Herpesviridae as above. There is no cure for the disease and it is difficult to detect.

D = 1) dorsal fin (rays).

D = 2) Devonian, a geological period within the Palaeozoic Era ca. 413-365 million years ago; called the Age of Fishes.

D° = day-degree (a unit taking temperature and time in days into consideration to indicate degree of development. Calculated by adding the average daily temperature for each day, e.g. if the average daily temperatures that a 3-day-old trout egg has been subjected to are 11, 12 and 13 degrees centigrade, the eggs are at the 36 day degree stage. This is abbreviated 36 D).

D1 = first dorsal fin (rays).

D2 = second dorsal fin (rays).

D3 = third dorsal fin (rays).

D30 = number of dorsal fin rays to the 31st vertebra, e.g. in Carapidae.

D200 = number of dorsal fin rays to the 201st vertebra, e.g. in Nemichthyidae.

DD = data deficient (in the IUCN Criteria for threatened species, a taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution is lacking. Data Deficient is therefore not a category of threat or Lower Risk. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and threatened status. If the range of a taxon is suspected to be relatively circumscribed, if a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified).

*descr.* = *descriptione*, meaning description.

*det.* = *determinavit*, meaning (s)he identified or determined. Often used for identification notes in collections. Also the abbreviation for determiner.

DFO = number of vertebrae anterior to the dorsal fin origin, e.g. in larval fishes.

dGH = degrees of water hardness (water hardness expressed in degrees of hardness. 0-4 is very soft, 5-8 soft, up to 30 which is extremely hard water). Also a degree of water hardness in Britain and the U.S.A. is measured in Clark degrees which equal 14.3 p.p.m. (1 part of calcium carbonate per 70,000 parts of water or 17.1 mg/L). In France 10 p.p.m. is used and in Germany 17.8 p.p.m.).

DH (dh or dH) = hardness, expressed in degrees (Germany). 1 DH = 17.86 p.p.m. Also used, confusingly, for water hardness generally as there are English, American and French measures too (see degrees of water hardness).

DHA = docosahexaenoic acid (an omega-3 fatty acid found in fish which protects ageing rodent brains from the clumping seen in Alzheimer's disease. May account for the reduction in risk of dementia and stroke in humans as a diet of fish replaces DHA lost in ageing).

DLS = double-layered spiral (a material made by rolling up a polyester pad and plastic wire mesh. It is used in both biological and mechanical filters in aquaria).

DMSP = dimethylsulphoniopropionate (a chemical released by phytoplankton and benthic algae, associated with coral reefs, when eaten. Planktivorous reef fishes use this chemical as a foraging clue).

Dn = a photophore in front of and above the eye and the olfactory capsule of Myctophidae.

DO = dissolved oxygen (the amount of oxygen freely available in water and necessary for aquatic life and the oxidation of organic materials. For fish, ideal levels are about 7-9 mg/l and most fish cannot survive levels below 3 mg/l).

DS = dissolved solids (very small pieces of organic and inorganic material contained in water. Excessive amounts make water less habitable for fish, unfit to drink or limit its use in industrial processes).

DSL = deep scattering layer (a layer in mid-depths of the sea detected by echo sounders, which rises at night and sinks during the day. Composed of organisms, many of which have a gas filled chamber, such as certain jellyfish and fishes. Also called false bottom).

DWT = dressed or dressing weight, the weight of a dressed fish (a fish with viscera, head and tail removed (some fish may have the tail on) but with skin and bone retained).

dz = doppel zentner (100 kg).

E = 1) exploitation rate (the proportion of a population at the beginning of a given time period that is caught during that time period (usually on a yearly basis). Also the ratio of fish caught to total mortality (= F/Z when fishing and natural mortality take place concurrently (Ricker, 1975)). Also called rate of exploitation).

E = 2) electivity index (an index showing the degree of choice a predator shows in its feeding behaviour, e.g. of a predator on plankton; E is derived from  $r_i - p_i / r_i + p_i$  where  $r_i$  is percent composition of plankter i in the gut contents and  $p_i$  is percent composition of plankter i in the plankton sample. Values for E range from -1 to +1 with -1 meaning complete avoidance, 0 meaning no active selection, and +1 meaning complete selection).

e.g. = *exempli gratia*, meaning for example.

e.p. = *ex parte*, meaning in part, partly.

EA = enterprise allocation (a quota from a particular fishery stock allocated to one company operating more than one vessel. Must be fished during the year allocated although timing is up to the company and the allocation can be transferred to another company).

EC = effective concentration (the concentration of a substance in water needed to produce a specific effect to a portion of test animals, e.g. EC<sub>50</sub> is the concentration producing an effect in 50% of the test fish).

EEZ = Exclusive Economic Zone (waters out to 200 nautical miles (370.40 km) from shore where international waters begin. Reserved to that country for exploitation and management of resources. Also called the 200-mile limit).

EFL = eye-fork length (straight or curved-body length between the posterior orbit and the fork of the tail; used in measuring billfish species).

EFZ = Exclusive Fishing Zone (the exclusive fishing zone out to 200 nautical miles, replaced by the EEZ).

EIL = Enhanced Inspection List (in food inspection, a list maintained by the Canadian Food Inspection Agency which identifies imported fish products about which the Agency has information indicating the product may be unsafe or unwholesome, and for which the Mandatory Inspection List is not effective in managing the product safety risk. Abbreviated as EIL. Import of products on the EIL requires mandatory proof of product compliance).

EIS = Environmental Impact Statement (a document prepared to describe the effects of proposed activities (such as implementation of a fisheries management plan) on the environment. Impacts can be positive or negative or both and the document may also describe ways to mitigate impacts).

*emend.* = *emendatus*, emended or altered (by); used where the author has changed the original spelling of a taxon without excluding the type of the name. The abbreviation precedes the name of the author effecting the change.

EN = endangered (said of a species facing imminent extirpation (nationally) or extinction (world-wide), in the IUCN Criteria for threatened species, a taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future).

EPA = eicosapentaenoic acid, an omega-3-fatty acid, *q.v.*, found in fish oil; its chemical name is *all-cis-5,8,11,14,17-icosapentaenoic acid*. Also called icosaPentaenoic acid and timnodonic acid.

ERM = enteric redmouth disease (a systemic bacterial disease caused by *Yersinia ruckeri* found mostly in salmonids. Symptoms are severe congestion, septicaemia and haemorrhage in head tissues such as the palate and operculum with the lower jaw being eroded. Internal organs can also be infected. Abbreviated as ERM. Also called Hagerman redmouth disease).

*err. typ.* = abbreviation for *errore typographico*, meaning typographical error, *q.v.*

*err. typogr.* = *errore typographico*, meaning typographical error.

ESU = evolutionarily significant unit (a population or group of populations inhabiting a defined geographical area that comprises a unique segment of the species; a distinct population, reproductively isolated from other conspecific populations and is an important evolutionary legacy of the species).

*et al.* = *et alii* meaning and others; used in author citations where the initial author's name is followed by *et al.* to indicate there are more authors.

*et seq.* = *et sequens* (and the following. Used, for example, after a page number to indicate that following pages should also be referred to).

*etc.* = *et cetera*, and so on.

EW = extinct in the wild ( in the IUCN Criteria for threatened species, a taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal,

annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form).

EX = extinct (in the IUCN Criteria for threatened species, a taxon is Extinct when there is no reasonable doubt that the last individual has died).

*ex aff.* = *ex affinis*, meaning of affinity.

*ex gr.* = *ex grupo*, meaning of the group of.

*excl.* = *exclusus*, meaning excluded. Used to indicate those components included in a given taxon by one author but excluded by the present author.

*excl. gen.* = *excluso genere*, meaning with the genus excluded.

*excl. spec.* = *exclusa speciei*, meaning with the species excluded.

*excl. specim.* = *exclusis speciminibus*, meaning with the specimens excluded.

Extra E = the highest grade of freshness in the European community.

EW = extinct in the wild (in the IUCN Criteria for threatened species, a taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form).

F = 1) the fishing mortality rate in a particular stock. It is roughly the proportion of the fishable stock that is caught in a year.

F = 2) Fahrenheit, a measure of temperature used in the U.S.A. and in older literature. The conversion is  $^{\circ}\text{F} = (^{\circ}\text{C} \times 9/5) + 32$  and  $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$ . Usually presented as  $^{\circ}\text{F}$  (or  $^{\circ}\text{C}$ ) but strictly  $3^{\circ}\text{F}$  is an actual temperature while  $3\text{F}^{\circ}$  is a range of three degrees. Water freezes at  $32^{\circ}\text{F}$  and boils at  $212^{\circ}\text{F}$ .

F = instantaneous rate of fishing mortality (used to describe the decrease in numbers of fish over time when fishing and natural mortality act concurrently ( $N_t = N_0 * e^{-Zt}$ , where  $N_0$  is the initial number and  $N_t$  is the number of the remaining fish at the end of time  $t$ .  $Z$  is the instantaneous total mortality rate, usually composed of  $M + F$ , where  $M$  is the natural mortality rate and  $F$  is the mortality rate caused by the fishery). Also called rate of fishing; instantaneous rate of fishing mortality, force of fishing mortality).

f (or  $f$ ) = fishing effort (effective fishing effort (Ricker, 1975), e.g. hooks per day, adjusted or standardised, when necessary, so that each increase in the adjusted unit causes a proportional increase in instantaneous rate of fishing (Ricker, 1975). Controls purported to limit effective effort imply that the fishing mortality rate is to be limited. Also abbreviated as  $F/q$  or  $F/q$ ).

*f.* = *forma* or form (i.e. a neutral term for a single individual, phenon, or taxon; a group; or an infrasubspecific group, or in the past, a subspecies (not recommended usage)). According to the International Code of Zoological Nomenclature the use of the term "form" before 1961 is not to be interpreted as an express statement of either subspecific or infrasubspecific rank and after 1960 it is to be regarded as of infrasubspecific rank). Also used as an abbreviation for *figura*, meaning figure or illustration.

(f) = female.

F<sub>0.1</sub> or F<sub>0.1</sub> (F zero point one) = the fishing mortality rate at which the marginal yield-per-recruit, i.e. the increase in yield-per-recruit in weight for an increase in one unit of fishing mortality, is only 10 percent of the marginal yield-per-recruit on the unexploited stock. The fishing mortality rate at which the slope of the yield-per-recruit curve is only one-tenth the slope of the curve at its origin. It is an approximation to the level of fishing mortality that will generate the maximum sustainable yield when a more accurate estimate is not possible.

F<sub>1</sub> = the offspring resulting from a parent cross, the first generation (F<sub>2</sub> is the second generation).

F10% = the level of fishing mortality, F, at which an average female in the population will produce 10% of the eggs that would be produced by a female that was left to live out her natural life span, i.e. unfished.

F30%SPR = F corresponding to a spawning stock biomass per recruit (SSB/R) which is 30% of the SSB/R obtained when F=0.

F/O = fish only, a saltwater aquarium that only contains fish with non-living rocks, corals, shells, and other decorative items. Abbreviated also FO.

F/q or F/q = effective fishing effort (fishing effort, e.g. hooks per day, adjusted or standardised, when necessary, so that each increase in the adjusted unit causes a proportional increase in instantaneous rate of fishing (Ricker, 1975). Controls purported to limit effective effort imply that the fishing mortality rate is to be limited).

F-ratio = the ratio of fishing mortality on the oldest age group to the fishing mortality of the preceding age group. Annual F-ratios are estimable parameters in many tuned virtual population analysis assessments.

FAD = 1) fish aggregating device (artificial or natural floating objects placed on the ocean surface, often anchored to the bottom or drifting, to attract several schooling fish species underneath, thus increasing their catchability. Used with tuna, for example. Also called fish attracting device).

FAD = 2) fish attracting device; variant on FAD (1).

fam. = family.

fath = fathom (a measure of water depth, 1.8288 metres, 6 feet or 2 yards).

FCZ = Fishery Conservation Zone (the area from the seaward limit of state waters out to 200 nautical miles. The term is used less often than the current term, Exclusive Economic Zone).

ff. = folios following, after a page number reference indicating the following pages are relevant.

fh = a French measure of water hardness, 10.0 p.p.m. calcium carbonate.

FL = fork length (the distance from the most anterior point of the body to the deepest point of the fork in the caudal fin. Mostly used in fishery biology and not in systematics).

fl oz = fluid ounce (29.573 g water).

fl oz<sub>BI</sub> = Imperial fluid ounce (28.413 millilitres or cm<sup>3</sup>).

fl. = *floruit* (1) flourished, referring to the period of greatest success and diversity of a taxon. Usually seen as the abbreviation.

fl. = *floruit* (2) flourished, used before the date of an author to indicate when he was actively working, especially when birth and death dates are unknown. Also used for an author of a name. Usually seen as the abbreviation.

*fl.* = fl.

F<sub>lim</sub> = limit fishing mortality, a value above which fishing should be avoided. See also precautionary approach, F<sub>pa</sub>, B<sub>pa</sub> and B<sub>lim</sub>.

Floss or F<sub>loss</sub> = fishing mortality corresponding to an expected lifetime contribution to the spawning stock biomass for the average recruit to the fishery (SSB/R) equal to the inverse of R/SSB at the lowest observed spawning stock (LOSS).

Flow or F<sub>low</sub> = fishing mortality (F) corresponding to a SSB/R equal to the inverse of the 10% percentile of the observed R/SSB.

Fmax or F<sub>max</sub> = the rate of fishing mortality for a given exploitation pattern, rate of growth, and natural mortality that results in the maximum yield per recruit; the point that defines growth overfishing.

Fmed = the fishing mortality rate corresponding to an equilibrium spawning potential ratio (SPR) equal to the inverse of the median observed survival ratio (ratio of recruits to parental spawning biomass). Such a stock exploited at Fmed should be able to replace itself close to historical abundance.

FMP = Fishery Management Plan (a plan to achieve specified management goals for a fishery. It includes data, analyses, and management measures for a fishery).

FMSY or F<sub>MSY</sub> = the fishing mortality rate which, if applied constantly, would result in maximum sustainable yield. Can be estimated from simple biomass-aggregated production models or from age-structured models that include a stock-recruitment relationship.

FO = fish only, a saltwater aquarium that only contains fish with non-living rocks, corals, shells, and other decorative items. Abbreviated also F/O.

fo. = folio (a leaf of a book or manuscript. It may also indicate separate parts of a work).

f<sub>opt</sub> = the effective fishing effort corresponding to FMSY (*q.v.*). Also called fMSY.

F<sub>pa</sub> = the precautionary fishing mortality, a lower level than F<sub>lim</sub> (*q.v.*) to allow for uncertainties in assessment. See also precautionary approach, B<sub>lim</sub>, B<sub>pa</sub> and F<sub>lim</sub>.

FPC = fish protein concentrate (a flour comprised of dried and powdered fish used as a food supplement. It is odourless, tasteless and has more protein than in the original fish flesh).

FRT = fast repetitive tick (a high-pitched sound caused by a stream of air bubbles expelled from the anus of herring (*Clupea pallasii*). Apparently used in communication (<http://www.newscientist.com/news/news.jsp?id=ns99994343>, downloaded 29 November 2003)).

ft = foot (0.305 m, 12 inches).

ft/min = feet per minute (0.5080 cm/s, 0.0167 ft/s).

ft/s = feet per second (30.48 cm/s).

ft<sup>3</sup> = cubic foot (957.5 fl oz, 59.84 pt, 28.317 mL, 0.0283 m<sup>3</sup>).

ft<sup>3</sup>/s = cubic feet per second (28.317 L/s, 7.841 gal/sec).

F<sub>threshold</sub> = maximum fishing mortality threshold (the rate of fishing mortality, that if exceeded, will result in overfishing and jeopardize the capacity of a stock to produce maximum sustainable yield on a continuing basis).

FX% = the fishing mortality that will reduce the equilibrium spawning potential per recruit to X% of what it would be without any fishing. It is also the F that results in X% equilibrium spawning potential ratio. Also called FX%SPR.

G (or g) = instantaneous rate of growth (a measure of the weight increase, the natural logarithm of the ratio of final weight to initial weight of a fish in a unit of time, usually a year. When applied collectively to all fish of a given age in a stock, the possibility of selective mortality must be considered (Ricker, 1975). The formula is  $g = [\ln(W_t) - \ln(W_0)]/(t_1-t_0)$  where W<sub>t</sub> is the weight of the fish after t<sub>1</sub> days and W<sub>0</sub> is the initial weight).

g = gram(me) (0.0022 lb).

G.S.I. = gasterosomatic index (weight of gut in grammes x 100/weight of fish in grammes (Desai, 1970)).

gal = gallon (U.S., 3.785 L).

gal<sub>BI</sub> = gallon (Imperial, 4.454 L).

gal/min = gallon per minute (3.875 L/min).

gen. = genus, meaning genus

gen. et sp. nov. = genus et species nova, meaning new genus and species.

gen. nov. = genus novum, meaning new genus.

gen. rev. = genus revivisco, meaning genus revived for a reinstated genus from an earlier synonymy.

GH = general, total or permanent hardness. A measure of the overall concentration of calcium, magnesium and other ions. One degree equals about 17.9mg/l. The degree symbol is often replaced with a "d" (i.e. 6dGH). The harder the water, the higher the GH.

GIS = Geographic Information System (a computer system based on geographical coordinates (latitude and longitude) linked to various data such as temperature, habitat type, depth, catches, etc. used in zoogeographical analyses).

glof = glacial lake outburst floods (the formation of lakes behind glacial debris that may then degrade and cause a flood, devastating to fish and people).

Gloss = the replacement line corresponding to the lowest observed spawning stock (or loss). The slope of the replacement line joining the origin of the stock-recruitment plot to the point given by the fitted recruitment value Rloss, at the lowest observed spawning stock biomass, Sloss. The slope is calculated from Gloss = Rloss/Sloss.

GM = GMO.

GMO = genetically modified organism, e.g. in fishes such species as zebra danios, *Danio rerio*, and medaka, *Oryzias latipes*, carry genes from other organisms such as the fluorescent pigments of corals. They have appeared on sale in the aquarium trade in some countries but are banned in most countries; Atlantic salmon have been gene modified with a growth hormone from chinook salmon and a cold weather switch from ocean pout and grow at twice the rate of normal fish.

GPS = global positioning system (a hand-held electronic system that uses satellite signals to give exact locations on the earth's surface as latitude and longitude. Various used for locating fisheries, favourite angling spots and scientific sampling locations. Takes all the fun out of getting lost with maps).

GSI = gonadosomatic index (gonad weight expressed as a percentage of whole body weight).

h (or  $\bar{h}$ ) = annual growth rate (the increase in weight of a fish over one year (final weight divided by initial weight) (Ricker, 1975).

h and g = headed and gutted. Factory ships often remove the head and guts of fish before freezing them.

ha = hectare (107,640 ft<sup>2</sup>, 10,000 m<sup>2</sup>).

HNV = high nutritional value (a term used to describe baits in angling, especially boilies).

HSL = hepatosomatic index ( liver weight as a percentage of the whole body weight (Htun-Han, 1978)).

i.e. = *id est* or that is.

IBI = index of biotic integrity (the use of fish sampling data to indicate the overall health and integrity of a stream. Measures of fish species composition, trophic composition, reproductive behaviour and abundance and condition are used. Sites with high biotic integrity have relatively high numbers of total species).

ib. = *ibidem*, meaning in the same place; used to indicate same reference or author.

*ibid.* = *ibidem*, meaning in the same place; used to indicate same reference or author.

IC = the entire, ventral row of photophores running from the anterior end of the isthmus to the posteriormost photophore on the caudal peduncle.

ich = ichthyology.

ICZN = International Commission on Zoological Nomenclature, the judicial body empowered to enforce and interpret the International Code of Zoological Nomenclature (which presumably has the same acronym).

ieX = ion exchange (a process used in aquaria to treat the water, softening it or removing pollutants).

IFQ = individual fishing quota (a quota, e.g. a percentage, of a total allowable catch assigned to an individual, a vessel or a company. Also called individual quota).

IGFA = the International Game Fish Association which records and maintains capture data on angled fishes.

IHN = infectious haematopoietic necrosis (an acute Rhabdovirus-group viral disease of salmonids transmitted from fish to fish and by eggs in western North America, e.g. in chinook and sockeye salmon and rainbow trout. The disease destroys the haemotopoietic tissues in the kidneys. Particularly affects fish less than 5 cm long in water below 10°C. Potentially dangerous to humans).

in. = inch (2.54 cm).

*in adnot.* = *in adnotatione*, meaning in an annotation.

*in litt.* = *in litteris* (in correspondence or communicated in writing. Used for an unpublished source of information. NOT in literature).

*in syn.* = *in synonymis*, meaning in synonymy.

*inc. sed.* = *incertae sedis* (of uncertain seat, meaning of uncertain taxonomic position or affinities).

*incl.* = *inclusus*, meaning included.

*indet.* = indeterminate (not defined, not definite, not classified. Used in reference to specimens that cannot be identified through lack of knowledge, unavailable expertise, time, missing critical characters, etc.); may appear on labels, in reports, etc.

*ined.* = *ineditus* (unpublished; used for example on a specimen label as a handwritten name, a name in a manuscript, and a work in press).

INM = an international nautical mile (1.852 kilometres, 1.151 miles or 1 minute latitude of the great circle of the earth. Three nautical miles make one league. The British nautical or Admiralty mile was 6080 feet (1853.18 m) while the U.S. nautical mile was 6080.2 feet (1853.24 m)).

*inq.* = *inquilinus* (an unofficial term in nomenclature for a taxon that has been naturalised).

IO = infraorbital canal (the cephalic lateral line canal (*q.v.*) extending from behind and below the eye to behind the upper lip).

IP = initial phase in diandric fishes (possessing two different types of males, a large, brightly-coloured and aggressive terminal phase (TP) and a smaller, drab and relatively non-aggressive initial phase (IP), e.g. in *Thalassoma lunare* (Labridae). The TP has priority access to food and spawning females. On the death or removal of a TP, the first-ranking IP becomes the next TP (after first checking the reef thoroughly to make sure the TP is gone)).

IQ = individual quota (a quota, e.g. a percentage, of a total allowable catch assigned to an individual, a vessel or a company. Also called individual fishing quota).

iqf = individually quick frozen.

ISA = infectious salmon anaemia (a viral disease of salmonids such as Atlantic salmon, sea-run brown trout and rainbow trout. The anaemia leaves fish open to other diseases and the kidneys may haemorrhage and the spleen swell. The disease is transmitted from fish to fish and from sea lice to fish).

ITQ = individual transferable quota (assigning a fixed share of the catch to each fisherman as a tradable right, one that can be sold or leased to others).

IUCN = International Union for Conservation of Nature and Natural Resources.

IUCN Criteria = criteria developed to assess the threatened status of species using numerical measures of populations, their levels, range, decline, etc.

IUU = illegal, unregulated and unreported fishing vessels.

IV = a row of ventral photophores running from the anterior end of the isthmus to the origin of the pelvic fin.

J = Jurassic, a geological period of the Mesozoic Era ca. 210-140 million years ago.

K = Cretaceous, a geological period of the Mesozoic Era ca. 140-65 million years ago.

ka = thousands of years ago.

kaf = 1000 acre-feet. Used in reservoir management in the U.S.A.

kg = kilogram(me) (2.2046 lb).

KH = buffering capacity, temporary or carbonate hardness, measured in degrees (K is from the German word karbonate). KH makes up a component of GH, q.v., so boiling will also reduce GH slightly. One degree KH is equal to 17.9 mg/l CaCO<sub>3</sub>. The degree symbol may be replaced with a d e.g. 2 dKH).

KHV = koi herpes virus (a viral infection of both ornamental koi and fish-farmed common carp (*Cyprinus carpio*) and therefore of considerable effect on economically valuable populations. First isolated in 1998, there is no test for it during the asymptomatic period which can be lengthy).

km = kilometre (0.621 mi).

kn = knot (speed in nautical miles per hour, 1.0 INM/h, 1.15 m.p.h. or 1.8532 km/h).

ky = 1000 years.

L = litre (33.81 fl oz, 0.264 gal).

L<sub>1</sub> = total length at formation of first winter annulus in the scale or otolith.

l<sub>1</sub> = total length at formation of first winter annulus in the scale or otolith as determined by back calculation from the formula l<sub>1</sub> = Lv/V where v is the linear dimension of the scale within the first winter annulus and V is the linear dimension of the scale.

L<sub>50</sub> = length at first maturity (length at which 50% of the individuals of a given sex are considered to be reproductively mature. Usually based on females and estimated by fitting a logistic curve to the relationships between proportion mature and length).

I.c. = *loco citato*, place cited (publication and page), meaning cited above; used to avoid repetition of a reference. Abbreviated also as *loc. cit.*

L/min = litres per minute (0.264 gal/min).

*lat.* = *latus*, meaning wide or broad.

Lat. = Latin; used to explain the use of a word of Latin origin, e.g. in scientific names, anatomy.

lb = avoirdupois pound (0.454 kg).

lb tr = troy pound (0.373 kg).

LD<sub>50</sub> = lethal dose–50 or the dose of a toxicant that is fatal to 50 percent of the fish tested over a specified time.

leg. = collector from the Latin *lego* to gather, collect and *legulus*, a collector. A person or institution who finds and secures specimens. Abbreviation often occurs on labels and is scientific descriptions of species. See also coll.

*loc. cit.* = *loco citato*, place cited (publication and page), meaning cited above; used to avoid repetition of a reference. Abbreviated also as *I.c.*

LR = lower risk (in the IUCN Criteria for threatened species, a taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the Lower Risk category can be separated into three subcategories: 1) Conservation Dependent (cd). Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation programme targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years, 2) Near Threatened (nt). Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable and 3) Least Concern (lc). Taxa which do not qualify for Conservation Dependent or Near Threatened).

LRP = limit reference point (indicates the limit beyond which the state of a fishery and/or a resource is not considered desirable. Fishery development should be stopped before reaching it).

LTPY = long-term potential yield (the largest average harvest that can be taken from a fish stock on a sustainable basis, allowing for variable environmental conditions).

M = instantaneous rate of natural mortality (when natural and fishing mortality operate concurrently it is equal to the instantaneous total mortality rate, multiplied by the ratio of natural deaths to all deaths (Ricker, 1975). Also called force of natural mortality).

m = annual mortality rate (the ratio between the number of fish which die during a year from causes other than fishing and the number alive at the beginning of that year. Also called annual natural mortality rate, conditional natural mortality rate, seasonal natural mortality rate). Also abbreviated as n.

m (or m) = conditional fishing mortality rate (the fraction of an initial stock which would be caught during the year (or season) if no other causes of mortality operated (Ricker, 1975). Also called annual or seasonal fishing mortality rate).

m = metre (1.094 yd).

m. = muscle.

m. = musculus.

*m.* = *mihi* (belonging to me, to me, of me (as of authorship of a new species, or used to show the writer's responsibility for a statement or proposal)).

(m) = male.

m.s.l. = mean sea level.

Ma = million years ago.

maf or Maf = million acre-feet.

*masc.* = *musculus*, meaning male.

max = maximum.

MCS = monitoring, control and surveillance (activities by the fisheries enforcement system to ensure compliance with fishery regulations).

Md = a row of photophores on the mandible in Myctophidae.

MEC = maximum equilibrium catch (maximum sustainable yield (the average or maximum catch that can be removed under existing environmental conditions over an indefinite period without causing the stock to be depleted, assuming that removals and natural mortality are balanced by stable recruitment and growth. Also called maximum equilibrium catch, maximum sustained yield, sustainable catch)).

MEI = morphoedaphic index (an index of potential fish production in lakes. Calculated by total dissolved solids (mg/l)/mean depth in metres).

MEY = maximum economic yield (the total amount of profit that could be earned from a fishery if it were owned by an individual).

mho = abbreviation for conductivity, *q.v.*, measured in micromhos (siemens is the metric version).

mi = mile (1.609 km, 0.870 INM).

MIL = Mandatory Inspection List (in food inspection, a list maintained by a government agency in accordance with inspection regulations which identifies imported fish products found to be non-compliant with requirements following an inspection. Imports of products on the list are subject to mandatory inspection).

*min. parte* = *pro minore parte*, meaning for the smaller part.

mm = millimetre.

mm. = muscles.

MS (MSS plural) = manuscript (a text, either handwritten or typed, but not available in multiple copies. Used for the copy of a scientific paper submitted to a journal for publication. Abbreviated also as MSc, MScr or MSS (plural), and all these may be in lower case and with or without a period).

MS-222 = tricaine methanesulphonate, a fish anaesthetic applied by immersion in dosed water.

MSc = manuscript (a text, either handwritten or typed, but not available in multiple copies. Used for the copy of a scientific paper submitted to a journal for publication. Abbreviated also as MS, MScr or MSS (plural), and all these may be in lower case and with or without a period).

MScr = manuscript (a text, either handwritten or typed, but not available in multiple copies. Used for the copy of a scientific paper submitted to a journal for publication. Abbreviated also as MS, MSc or MSS (plural), and all these may be in lower case and with or without a period).

MSDS = Material Safety Data Sheet (documents form the manufacturer of a chemical outlining its toxicity, volatility, flammability and other safety related information. Posted in laboratories where such chemicals are used; formalin is probably the commonest and most toxic chemical encountered by ichthyologists).

MSP = maximum spawning potential of a fish stock (spawning potential ratio, *q.v.*, or % MSP (the ratio of spawning potential per recruit under a given fishing regime relative to the spawning potential per recruit with no fishing)).

MSST =  $B_{\text{Threshold}}$  or minimum stock size threshold or MSST. At stock sizes below  $B_{\text{Threshold}}$ , the stock is considered to be overfished.

MSY = maximum sustainable yield (the average or maximum catch that can be removed under existing environmental conditions over an indefinite period without causing the stock to be depleted, assuming that removals and natural mortality are balanced by stable recruitment and growth. Also called maximum equilibrium catch, maximum sustained yield, sustainable catch).

MT = metric ton (tonne; 1000 kilograms, 0.984 long tons, 1.1023 short tons or 2204.6 pounds).

mt = metric ton (tonne; 1000 kilograms, 0.984 long tons, 1.1023 short tons or 2204.6 pounds).

mtDNA = mitochondrial DNA (a form of DNA, the chemical basis of heredity, found in the mitochondria (or energy producing structures within cells) and used to identify and relate fish species).

*mut. char.* = *mutatis characteribus* (with the characters changed (by); emend., *emendatus*).

my = million years (ago).

MYA = million years ago.

mybp = million years before present.

myr = million years (ago).

N = number of fish studied; n is often used.

n = annual mortality rate (the ratio between the number of fish which die during a year from causes other than fishing and the number alive at the beginning of that year. Also called annual natural mortality rate, conditional natural mortality rate, seasonal natural mortality rate). Also abbreviated as m.

n = the haploid chromosome number.

*n.* = *nobis*, meaning to or of us; *nomen*, meaning name; *novus*, meaning new; *nudum*, meaning naked.

n.b. = *nota bene*, take notice, note well. Also NB.

*n. g.* = new genus.

*n. n.* = *nomen novum*, q.v., or new name; or *nomen nudum*, q.v.

*n. nov.* = *nomen novum*, q.v., or new name.

*n. sp.* = *nova species*, meaning new species.

*n. v.* = *non visus*, meaning not seen.

NAFO = Northwest Atlantic Fisheries Organization, responsible for setting quotas for some stocks that are outside Canada's 200-mile limit, straddle the line, or are of mainly foreign interest.

NB = *nota bene*, take notice, note well. Also n.b.

nei = not elsewhere included. In fisheries catch statistics, refers to catch data that cannot be linked directly to a State or fishing entity, for whatever reason.

NL = notochord length (the distance from the snout tip to the posterior tip of the notochord).

*no.* = *numero*, meaning number.

*nob.* = *nobis* (to or of us; used after a scientific name to indicate the author's responsibility for its description, or for an action or proposal).

*nom.* = *nomen*, meaning name.

*nom. abort.* = *nomen abortivum* (a name contrary to the International Code of Zoological Nomenclature as the Code existed at the time of publication).

*nom. ambig.* = *nomen ambiguum* (an ambiguous name, one used by different authors for different taxa over so long a period that it has become a persistent cause of error and confusion).

*nom. approb.* = *nomen approbatum* (a name given approval by the International Commission on Zoological Nomenclature for use in nomenclature).

*nom. conf.* = *nomen confusum* (confused name a name based on elements of more than one species from which it is impossible to select a lectotype).

*nom. confus.* = *nomen confusum* (confused name a name based on elements of more than one species from which it is impossible to select a lectotype).

*nom. cons.* = *nomen conservandum* (a name preserved by the International Commission on Zoological Nomenclature and entered on their Official Lists even though it strictly contravenes one or more provisions of the Code).

*nom. conserv.* = *nomen conservandum* (a name preserved by the International Commission on Zoological Nomenclature and entered on their Official Lists even though it strictly contravenes one or more provisions of the Code).

*nom. dub.* = *nomen dubium* (a doubtful or dubious name not certainly applicable to any known taxon; a name which cannot be recognized because of inadequate description, figure, etc. May possess availability conducive to uncertainty and instability).

*nom. hybr.* = *nomen hybridum* (hybrid name, formed by combining words from different languages).

*nom. illeg.* = *nomen illegitimum* (illegitimate name, a validly published name that must be rejected for the purposes of priority in accordance with the International Code of Zoological Nomenclature).

*nom. illegit.* = *nomen illegitimum* (illegitimate name, a validly published name that must be rejected for the purposes of priority in accordance with the International Code of Zoological Nomenclature).

*nom. inq.* = *nomen inquirendum* (a name which should be investigated).

*nom. inval.* = *nomen invalidum* (invalid name, a name that is not validly published or is unavailable).

*nom. legit.* = *nomen legitimatum* (legitimate name, a valid name published in accordance with the provisions of the International Code of Zoological Nomenclature).

*nom. monstr.* = *nomen monstrositatum* (a scientific name based on a monstrosity (a physically abnormal specimen)).

*nom. non rite public.* = *nomen non rite publicatum* (not properly published name, used to indicate that a name has not been validly published according to the provisions of the International Code of Zoological Nomenclature).

*nom. nov.* = *nomen novum* (a new name which is published to replace an earlier name (and valid only if the latter is preoccupied) and which is expressly proposed as a replacement name; a new name, not to be confused with a new species, or a new genus, etc., which represent new taxa. Commonly applied to names proposed to replace junior homonyms).

*nom. nud.* = *nomen nudum* (a naked name, a name that, if published before 1931, was not accompanied by a description, definition, or indication, or if published after 1930, is not accompanied by a statement that purports to give characters differentiating the taxon; or is not accompanied by a definite bibliographic reference to such a statement; or is not proposed expressly as a replacement for a pre-existing available name. A *nomen nudum* is not an available name, and therefore the same name may be made available later for the same or a different concept; in such a case it would take authorship and date from that act of establishment, not from any earlier publication as a *nomen nudum*).

*nom. oblit.* = *nomen oblitum* (a forgotten name, an unused senior synonym rejected under the provisions of the International Code of Zoological Nomenclature. Formerly a senior synonym not once applied to a particular taxon as its presumably valid name for the immediately preceding 50 years (other than in a synonymy, listing in an abstracting publication or a nomenclator) and to which taxon has been currently been applied a junior synonym by at least 5 different authors in at least 10 publications during the immediately preceding 50 years. Such a name, unless otherwise ruled, is to be rejected for the purposes of the Law of Priority but not for those of the Law of Homonymy. No longer recognised. After 1 January 2000 applied to a name, unused since 1899, which as a result of an action taken under the Code does not take precedence over a younger synonym or homonym in prevailing usage; the younger name which takes precedence over the *nomen oblitum* may be called a *nomen protectum*. A *nomen oblitum* remains an available name).

*nom. provis.* = *nomen provisorium* (provisional name, a name proposed provisionally in anticipation of the acceptance of the taxon concerned at a future date).

*nom. rejic.* = *nomen rejiciendum* (1) rejected name, any name (other than the valid name of a taxon) which has been officially rejected under the provisions of the International Code of Zoological Nomenclature, 2) a family or genus name that should replace another well-known name but which is rejected in favour of a *nomen conservandum*, *q.v.*).

*nom. non planta* = *nomen sed non planta* (used to indicate that a author has applied the name to a taxon other than that to which the type of the basionym, *q.v.*, belongs).

*nom. rev.* = *nomen revivisco* (name revived, used of a name revived or reinstated, e.g. from an earlier synonymy).

*nom. superfl.* = *nomen superfluum* (superfluous name, a name incorrectly applied to a taxon. When first applied the taxon included the type of another name which should have been used under the provisions of the International Code of Zoological Nomenclature).

*non al.* = *non aliorum* (not of other authors).

*nov.* = *novum*, meaning new.

*nov. n.* = *nomen novum* (a new name which is published to replace an earlier name (and valid only if the latter is preoccupied) and which is expressly proposed as a replacement name; a new name, not to be confused with a new species, or a new genus, etc., which represent new taxa. Commonly applied to names proposed to replace junior homonyms)).

*nov. sp.* = *nova species*, meaning new species (*species nova* is to be preferred).

nr = number.

NS = new style (indicates the Gregorian or modern western calendar. Some older fish literature, especially Russian, is dated by the Julian calendar or old style. The Gregorian calendar came into use in Catholic Europe in 1582 (the day after October 4 became October 15), in England in 1752 but only in 1918 in Russia).

NTZ = no take zone ( a marine protected area where catches or removal of organisms are prohibited).

O = Ordovician, a geological period within the Palaeozoic ca. 504-441 million years ago.

OA = the upper, ventro-lateral row of photophores running above the ventral series from just behind the operculum to above the anal fin.

OP = 1) photophores just posterior to the end of the upper jaw in Myctophidae, 2) photophores on the gill cover, one near the anterior base of the preopercle, one in front of the anterior part of the subopercle, and one antero-dorsally to the operculum, also called maculae opercularis, 3) opercular canal, *q.v.*

*op. cit.* = *opera citato*.

ORB = photophores near the eye; one antero-ventral to the eye is called the suborbital (or preorbital) and one postero-ventrally is called the postorbital.

*orig.* = *originalis* (original, used in nomenclature to indicate that a specimen is the original material, or part of it).

*orth. mut.* = *orthographia mutata* (with an altered spelling).

OS = old style (time reckoned according to the Julian calendar; subsequently replaced by new style (reckoned according to the Gregorian calendar and now in use in the West). Most scientific papers operate on the Gregorian or new style calendar but Russia only adopted the Gregorian system in 1918 and some of their nineteenth century papers and records are asynchronous by 11 days. This can be confusing when attempting to validate type material since catalogues, publications and labels with the types in jars can have different dates. Abbreviated as OS. See also new style).

oz = ounce (28.3495 g avoirdupois).

oz tr = troy ounce (31.103 g).

P = 1) abbreviation for pectoral fin.

P = 2) Permian, a geological period of the Palaeozoic ca. 290-245 million year ago.

P = 3) symbol for the (parental) generation in which fertilization produces hybrids.

P1 = pectoral fin.

P2 = pelvic fin; V is an alternate abbreviation.

p = probability.

p. = page.

pm or p.m. = *post meridiem*, for after noon indicating time after 12.00 noon.

p. p. = *pro parte* (in part, used in author citations to show that only part of a taxon, as defined by a previous author, is being referred to by the writer).

p.p.m. = parts per million.

p.p.t. = parts per thousand.

PAH = polycyclic aromatic hydrocarbons, chemicals found in fish products as environmental contaminants, usually at low concentrations, much higher where there is contamination from petroleum and petroleum products. Found in smoked fish at 10 times or more than unsmoked fish. Some PAHs are carcinogenic.

pb = personal best, the largest fish of a particular species caught by an angler. Seen particularly in British fishing magazines.

pers comm. = personal communication (unpublished information communicated to the author verbally).

pers. obs. = personal observation (information or data obtained by the actions of the author).

PFD = personal flotation device.

PGI = Protected Geographical Indication, a food name in the European Union that has a protected status and can only be used for a product or traditional recipe from a particular area, e.g. Cornish sardine, *q.v.*, Arbroath smokie, *q.v.*, Scottish Farmed Salmon, Grimsby Smoked Fish, *q.v.*

pH = a measure of how acidic or alkaline a solution is, i.e. the concentration of hydrogen ions in a solution (log to base10 of the reciprocal of the hydrogen ion concentration). pH 7.0 is neutral,

lower values are acidic and higher values are alkaline. Acid rain decreases the natural pH of rivers and lakes. Some fish require a specific pH, others will live at wide range of values.

pit = PIT.

PIT = Passive Integrated Transponder tags (an integrated microchip that is programmed to include specific fish information and inserted into the body cavity of the fish and decoded at selected monitoring sites. Used for identifying individual fish for monitoring and research purposes. The tag is activated by passing a hand-held scanner over the fish).

PKD = proliferative kidney disease (a temperature-dependent disease of salmonids caused by a myxosporean protozoan causing gross changes in the kidney).

PLO = maculae suprapectorales (a photophore above the base of the pectoral fin in Myctophidae).

PM = hyomandibular canal (or preoperculo-mandibular canal, the cephalic lateral line canal extending along the preoperculum and lower jaw. The preopercular and mandibular parts of the canal may be disconnected).

$P_{MAX}$  = the probability of re-building a fish stock by  $T_{MAX}$ . A higher  $P_{MAX}$  probability is associated with a lower fishing mortality rate.

PO = maculae pectorales (a row of photophores on the breast in front of the pelvic fin in Myctophidae).

Pol = maculae posterolaterales (ventrolateral photophore(s) above the AO series which lie along the base of the anal fin but below the lateral line in Myctophidae).

pp. = pages.

ppb or p.p.b. = parts per billion.

ppm or p.p.m. = parts per million.

ppt or p.p.t. = parts per thousand.

Prc = maculae praecaudales (photophore(s) on the lower half of the caudal peduncle at the base of the caudal fin in Myctophidae).

*pro sp.* = *pro specie* (as a species. Used in citations to indicate either that a binary name regarded as that of a hybrid was originally published as that of a species, or as a synonym of another).

prop. = proposal (1) an action, whether successful or unsuccessful, to establish a nominal taxon or name or to carry out a nomenclatural act. Also called *propositus*).

prop. = proposal (2) an application to the International Commission of Zoological Nomenclature for the adoption of a part of the List of Available Names in Zoology. Also called *propositus*).

PSU or psu = practical salinity unit (the ratio K of the electrical conductivity of a sea water sample of 15°C and the pressure of one standard atmosphere, to that of a potassium chloride (KCl) solution, in which the mass fraction of KCl is 0.0324356, at the same temperature and pressure. The K value exactly equal to one corresponds, by definition, to a practical salinity equal to 35. In this definition, salinity is a ratio and parts per thousand (‰) is therefore no longer used, but an old value of 35‰ corresponds to a value of 35 in the practical salinity. Practical salinity is a ratio and strictly no units should be used but often PSU or psu is added to the value).

pt = pint (473.17 cm<sup>3</sup>, U.S. liquid).

pt<sub>(BI)</sub> = pint (568.26 cm<sup>3</sup>, Imperial).

pt, dry = pint (550.6 cm<sup>3</sup>, U.S. dry).

PUFA = long-chain polyunsaturated fatty acids (omega-3-fatty acids) found in fishes.

PVA = 1) population viability analysis (a quantitative analysis which estimates the extinction probability of a species or population based on the known life history and specified management or non-management options),

PVA = 2) polyvinyl alcohol, a water soluble plastic used by anglers in Europe as bags to hold ground bait or as string for tying on boilies, *q.v.*, or pellets. The bags or strings dissolve gradually in water and release the baits to attract fish. See PVA bag and PVA tape.

PVO = maculae subpectorales (photophores below the pectoral fin and above the PO row in Myctophidae).

Q = Quaternary, a geological period of the Cenozoic Era ca. 1.6-0 million years ago comprising the Pleistocene and Holocene (or Recent).

q (or *q*) = catchability (the extent to which a stock is susceptible to fishing, the part of a stock that is caught over a defined unit of time or fishing effort; quantitatively, the proportion of the stock removed by a defined unit of fishing effort. In pelagic fishes, an inverse function of stock biomass. When it is 0.01 or less it can be used as an instantaneous rate in measuring population change (Ricker, 1975). Also called catchability coefficient, force of fishing mortality).

Q<sub>10</sub> = temperature coefficient (the quantitative increase or decrease in fish metabolic rate for each ten degree change in body or environmental temperature).

*q.e.* = *quod est*, meaning which is.

*q.v.* = *quod vide*, meaning which see.

ql = quintal (1) an old measure of dried, salt cod for sale, 112 pounds or 50.8 kg, 2) a hundredweight, either 112 or 100 pounds, according to the scale used, 3) also a modern measure equal to 100 kg or 220.46 pounds).

r or  $r = 1$ ) availability (the part of a fish population which lives in areas where it is susceptible to fishing during a given fishing season. This part receives recruits from or becomes mingled with the non-available part of the stock at other seasons, or in other years (Ricker, 1975). Fish become available through migration, movement in the water column, or growth), 2) intrinsic growth rate (how much a population can grow between successive time periods when not slowed down by competition. Often estimated with production models and plays an important role in evaluating the sustainability of different harvest levels and the capacity to recover after depletion).

r-selection = a life history strategy characterised by early maturity, rapid growth, large numbers of young produced at an early age, small body size, high mortality and short life span. This strategy is an adaptation to an unpredictable environment such as that found in the Arctic.

recent. = *recentiorum*, meaning of recent authors.

Rkm = river kilometre (distance from river mouth or other known locality to a specific site).

rkm = the distance between two points along a river.

rmi = river mile (distance from river mouth or other known locality to a specific site).

ROV = remotely operated vehicle (a vehicle that dives in deep water to film deepsea organisms such as fishes. It is controlled from onboard ship and carries no passengers. May be equipped to capture fish or lay traps).

S = 1) survival rate (number of fish alive after a specified time interval, divided by the initial number, usually on a yearly basis (Ricker, 1975).

S = 2) siemens, a measure of conductivity, *q.v.*

S = 3) Silurian, a geological period within the Palaeozoic ca. 441-113 million years ago. Most of the major groups of fishes are thought to have originated in the Early Silurian.

s = second.

$S_1$  = a salmon smolt that is transferred to sea water for on-growing after 1 year in fresh water ( $S_2$  = after two years).

s.a.p. = specific action potentiality (the state of an animal responsible for its readiness to perform the behavior patterns of one instinct in preference to all other behavior patterns; level of motivation).

*s. ampl.* = *sensu amplificato*, meaning in an enlarged sense.

*s. l.* = *sensu lato* meaning in the broad sense.

*s. lat.* = *sensu lato* (in the broad sense; using a taxon inclusively to embrace two or more taxa which other authors consider distinct).

*s. n.* = *sine numero*, meaning without a number, unnumbered.

*s. s.* = *sensu stricto*, meaning in the strict sense.

*s. str.* = *sensu stricto*, meaning in the strict sense, in the narrow sense.

*s-g.* = subgenus.

*s-gg.* = subgenera.

*s. n.* = *sine numero* (without number; used to indicate absence of a collector's number from a list of specimens).

*s. s.* = *sensu stricto* (in the strict sense, in the narrow sense; using a taxon restrictively, excluding taxa which other authors include).

*s. str.* = *sensu stricto* (in the strict sense, in the narrow sense; using a taxon restrictively, excluding taxa which other authors include).

SAO = maculae supraanales (a sloping, ventro-lateral row of photophores above the anal fin origin in Myctophidae).

*sc.* = *scilicet*, meaning namely.

*shed.* = *scheda* = label; used for the label on a specimen.

*sec.* = *secundum*, meaning according to.

*sens.* = *sensu*, meaning in the sense of.

*sens. amplo.* = *sensu amplificato* (in an enlarged sense).

*sens. lat.* = *sensu lato* (in the broad sense; using a taxon inclusively to embrace two or more taxa which other authors consider distinct).

*sens. str.* = *sensu stricto* (in the strict sense, in the narrow sense; using a taxon restrictively, excluding taxa which other authors include).

*seq.* = *sequens*, meaning following.

*ser.* = *series*, meaning series.

SL = standard length (the measurement from the most anterior tip of the body to the midlateral posterior edge of the hypural plate (in fish with a hypural plate) or to the posterior end of the vertebral column (in fish lacking hypural plates). It may be restricted to the tip of the snout if the lower jaw projects. The base of the caudal fin (end of the vertebral column or posterior edge of the hypural plate) is determined by flexing the tail up while the caudal peduncle is held down. The resultant wrinkle or caudal flexure indicates the caudal base. It may also be determined by probing or dissection. Sometimes the posteriormost point is the last scale, the

last pored scale or the beginning of the caudal fin rays. It is the usual scientific measurement for length of a fish except in Amphioxii, Myxini, Petromyzontiformes, Elasmobranchii and Holocephali. This measurement is used because long-preserved fish often lose the tips of the caudal fin rays through breakage after the desiccation effect of alcohol. See total length and fork length. In Holocephali the length is usually taken from the tip of the snout to the origin of the upper caudal fin because the caudal filament breaks off frequently. In Scaridae it is taken back to the rear margin of the second to last lateral line scale {because the large scales obscure the point of caudal flexure. Also abbreviated as sl or Sl.).

SO = supraorbital canal (the cephalic sensory canal (q.v.) extending from above the eye to the nostrils).

sp. (spp. plural) = species (singular and plural) (biologically, a group of populations of actually or potentially interbreeding organisms which are reproductively isolated (by behavior, ecology, morphology or physiology) from other such groups. Taxonomically, the name of a category of organisms below the genus-group; an individual taxon of the category "species", e.g. *Perca fluviatilis*. Morphologically, the smallest group of animals that can always be separated (+95% of the specimens or all of the specimens) from other such groups by morphological characters (other than sex or individual genes) – does not include sibling species. A species is a subjective unit insofar as it is based on only a sample of the population and insofar as the point of separation where there is some overlap must be arbitrary. A nominal species is a named species, objectively defined by its type-specimen).

*sp. indet.* or *sp. ind.* = *species indeterminata* (an indeterminate species; one which cannot be recognized from its original description).

*sp. nov.* or *sp. n.* = *species nova* (new species; given after the scientific name instead of the authority (who as author of the article is assumed to be the authority)).

SPA = sequential population analysis (methods of back-calculating stock sizes, recruitment levels, and fishing mortality for different ages or years using catch-at-age data. The past history and present abundance of a stock).

spm = specimen.

sqm = scales counted along the side of the body as if in a lateral line, from the Latin *squama* for scale.

SPR = spawning potential ratio (the number of eggs that could be produced by an average recruit in a fished stock under a given regime divided by the number of eggs that could be produced by an average recruit in an unfished stock. This may also be expressed at the spawning stock biomass per recruit (SSB/R) of a fished stock divided by the SSB/R of the stock before it was fished. Also called percentage maximum spawning potential or %MSP).

SRR = stock recruitment relationship (the relationship between the level of parental biomass, e.g. spawning stock size, and subsequent recruitment level. Difficult to determine accurately).

SSB = spawning stock biomass (the total weight of the fish in a stock that are old enough to spawn; the biomass of all fish beyond the age or size class in which 50% of the individuals are mature. May be used instead of measuring egg production).

SSB/R = spawning stock biomass per recruit (the spawning stock biomass divided by the number of recruits to the stock. It is the expected lifetime contribution to the spawning stock biomass for a recruit of a specific age, e.g. per age 2 individual).

ssp. = one subspecies.

sspp. = more than one subspecies.

ST = occipital canal (supratemporal canal (the cephalic lateral line canal (*q.v.*) running across the top of the head joining the lateral canals).

st. = status, meaning rank.

stat. = status, meaning rank.

*stat. nov.* = *status novus*, meaning new status or new rank.

*stat. rev.* = *status revivisco*, meaning status revised.

STP = sodium tripolyphosphate (an additive used on fish to retain moisture).

subgen. = subgenus (1) a category of the genus-group subordinate to genus, 2) an individual taxon of the category "subgenus", e.g. *Clupea*.

subsp. = subspecies (1) a category of the species-group subordinate to species; the lowest category recognized by the International Code of Zoological Nomenclature, 2) an individual taxon of the category "subspecies". Allopatric populations of organisms differing genetically from other such populations and tending because of barriers not to interbreed with other such populations, although capable of doing so. Defined variously as differing at a level of 75-90% or 93% from (all or any) other such adjacent populations).

Suo = maculae supraorbitalis (the photophore on the posterodorsal border of the orbit in Myctophidae).

*supra cit.* = *supra citato*, meaning cited above.

syn. = synonym or synonymy (each of two or more names with different spelling applied to one and the same taxon. The junior synonym is that with the later, the senior synonym is that with the earlier, publication date. Objective synonyms are the two or more synonyms used on the same type. Subjective synonyms are the two or more synonyms based on different types, but which are regarded as referring to the same taxon by those zoologists who hold them to be synonyms).

*syn. nov.* = *synonymum novum* (new synonym, used when a name is treated as a synonym for the first time).

T = Tertiary, a geological period of the Cenozoic Era ca. 65-16 million years ago comprising the Palaeocene, Eocene, Oligocene, Miocene and Pliocene.

T<sub>R</sub> = Triassic, a geological period of the Mesozoic Era ca. 245-210 million years ago.

t = tonne ( metric ton, 1000 kg, 2204.62 pounds (lb), 0.984 long tons, 1.102 short tons. Often spelled ton, confusingly).

t. = *teste*, meaning according to, on the evidence of; and for *tomus*, meaning volume.

t. c. = *tomus citate*, meaning in the volume cited.

tab. = *tabula*, meaning table.

TAC = total allowable catch, the weight of fish of a given species or type caught by commercial fishing in any year. The TAC is set by a government in an effort to manage the resource.

TACC = total allowable commercial catch; same as above.

tax. n. = taxon novum (a new taxon, sometimes used when a name in particular rank is derived from a pre-existing generic name for the first time).

tax. nov. = taxon novum (a new taxon, sometimes used when a name in particular rank is derived from a pre-existing generic name for the first time).

tax. vag. = taxon vagum (a name used in an uncertain rank).

TDS = total dissolved solids, a measure of water quality ( the total residue remaining after evaporation of a water sample filtered to remove suspended matter larger than 1.0 mm; inorganic salts (principally calcium, magnesium, potassium, sodium, bicarbonates, chlorides and sulfates) and small amounts of organic matter that are dissolved in water, not suspended like wood pulp particles).

TED = turtle excluder device (any device used to exclude turtles from nets where they may drown; a grid of bars fitted to the mouth of the net allows fish and shrimps to enter but deflects the larger turtles).

ThRP = threshold reference point (indicates that the state of a fishery and/or a resource is approaching a target reference point (TRP) or a limit reference point (LRP), and that a certain type of action (usually agreed beforehand) needs to be taken. Fairly similar to a LRP in their utility, the ThRp specific purpose is to provide an early warning, reducing further the risk the the LRP or TRP are inadvertently passed due to uncertainty in the available information or inherent inertia of the management and industry systems).

TL = 1) total length (the greatest length of the whole body between the most anterior point of the body and the most posterior point, in a straight line, not over the curve of the body. Sometimes, when there are two equal lobes, the caudal rays are squeezed together and their tip is taken as the most posterior point, or the longest lobe is squeezed to the midline (maximum length or extreme tip length). Also an imaginary line may be drawn between the two

lobe tips and length to its mid-point taken as the most posterior point (total auxiliary length or bilobular length). Usually the tip of the most posterior lobe of the fin in normal position is taken as the posteriormost point (total normal length or natural tip length). Total length is used in Amphioxo, Myxini, Petromyzontiformes, usually in Elasmobranchii and sometimes in other fishes. Standard length, *q.v.*, is usually employed with Teleostei).

TL = 2) tolerance limit (a 24 hour TL<sub>50</sub> is the concentration of a chemical which kills (or effects in other specified ways) 50% of fish in 24 hours).

Tmax = lifespan (the maximum expected age, on average, for a species, cohort, stock, or a population in the absence of fishing. Smaller than maximum age although may be used in this sense. Abbreviated as Tmax in stock assessment models).

*tom.* = *tomus*, meaning volume.

Tmax = lifespan (the maximum expected age, on average, for a species, cohort, stock, or a population in the absence of fishing. Smaller than maximum age although may be used in this sense. Abbreviated as Tmax in stock assessment models).

TP = abbreviation for terminal phase in diandric fishes possessing two different types of males, a large, brightly-coloured and aggressive terminal phase (TP) and a smaller, drab and relatively non-aggressive initial phase (IP), e.g. in *Thalassoma lunare* (Labridae). The TP has priority access to food and spawning females. On the death or removal of a TP, the first-ranking IP becomes the next TP (after first checking the reef thoroughly to make sure the TP is gone).

tr. = transverse row of scales, diagonal scale row (the almost vertical rows of scales slanting backwards and downwards across the sides of the body. Divided into scales above the lateral line starting at the front of the dorsal fin (from, but not including, the scale in the middorsal row, to but not including, the lateral line scales) and below the lateral line similarly ending at the front of the anal fin. The number of transverse rows themselves along the body may also be counted).

TRAIL = Transgenerational Isotope Labelling, a stable isotope, e.g. barium, given to a female fish just before spawning so that the young fish have a chemical signature in their otoliths and can be tracked.

*trans. nov.* = *translatio nova*, meaning new transfer, and used to indicate that a taxon has been altered in position but retains the epithet from its name in the former position.

T<sub>TARGET</sub> = the target year set by a policy for fish stock to be completely rebuilt.

TURF = territorial use right in fisheries.

ty = a thousand years.

*typ.* = *typus* meaning type.

*typ. cons.* = *typus conservandus*, a type to be conserved.

$u$  (or  $u$ ) = rate of exploitation (the fraction, by number, of the fish in a population at a given time, which is caught and killed by man during the year immediately following (= FA/Z when fishing and mortality are concurrent). The term may also be applied to separate parts of the stock distinguished by size, sex, etc. (Ricker, 1975). Also called; fishing coefficient).

UDN = ulcerative dermal necrosis (a disease affecting salmonids returning from the sea to fresh water with head lesions. The cause is probably viral but the lesions are typically infected by bacteria and fungi).

ueq = microequivalents, e.g. 20 ueq/l = 1 mg/l CaCO<sub>3</sub>.

UTM = Universal Transverse Mercator = a system for indicating locations on the Earth's surface based on ground distances. Locations are designated in terms of distances in metres east of the centre of a UTM zone and north (or south) of the equator. The earth is divided into sixty zones, each 6 degrees of longitude wide. Each zone is projected onto a Transverse Mercator projection. UTM zone 1 extends from 180° to 174°W. Each zone extends from 80°S latitude to 84°N.

V = 1) abbreviation for ventral (pelvic) fins.

V = 2) abbreviation for vulnerable in the IUCN Categories, *q.v.*

V = 3) abbreviation for utilised stock (the part, by number, of the fish alive at a given time, which will be caught in the future (Ricker, 1975)).

v = 1) abbreviation for *vide*, meaning see or consult; and *visum*, meaning seen.

v = 2) abbreviation of volume.

v = 3) abbreviation of *varietas*, meaning variety.

v = 4) abbreviation of *vel*, meaning or.

v = 5) versus, meaning against, as opposed to, in contrast to. Also as vs.

v = 6) *vice*, meaning in place of; in succession to.

*v. et.* = *vide etiam*, meaning see also.

VD trawl = Vigneron-Dahl trawl (the usual rig of an otter trawl with long cables that frighten fish toward the net).

verosim. = verosimiliter (probably).

VHS = Egtved disease (an acute or chronic disease of salmonids, such as rainbow trout in farm ponds, causing loss of appetite and of schooling behaviour, darkened colour, bleeding, hyaline gills and exophthalmia. It is associated with temperature changes and with the late winter and spring seasons when temperatures are below 8°C. Also called viral haemorrhagic septicaemia).

VLO = maculae supraventrales (a photophore above the ventral fin in Myctophidae).

VMS = vessel monitoring system, a system for tracking fishing vessels electronically using satellites.

VO = maculae ventrales (a row of photophores on the abdomen behind the ventral fin in Myctophidae).

vs = versus, meaning against, as opposed to, in contrast to. Also as v.

$W_r$  = relative weight (a body condition index; from the measured weight of an individual fish (times 100) divided by a standard weight for the species at that length. Standard weight is the 75th percentile of the weights of a given species within specified length increments).

$W_s$  = standard weight, the 75th percentile of the weights of a given species within specified length increments.

XBT = expendable bathy-thermograph, an instrument that records water temperature with depth.

$Y'$  = surplus production (production of new weight by a fishable stock, plus recruits added to it, less what is removed by natural mortality. Usually estimated as the catch in a given year plus the increase in stock size or less the decrease (Ricker, 1975). Also called natural increase, sustainable yield, equilibrium catch.

$Y_s$  = maximum sustainable yield (the average or maximum catch that can be removed under existing environmental conditions over an indefinite period without causing the stock to be depleted, assuming that removals and natural mortality are balanced by stable recruitment and growth. Abbreviated also as MSY. Also called maximum equilibrium catch, maximum sustained yield, sustainable catch).

$Y/R$  = yield-per-recruit (the expected lifetime yield-per-fish of a specific age, e.g. per age 2 individual. For a given exploitation pattern, fishing regime, rate of growth and natural mortality, an expected equilibrium value of  $Y/R$  can be calculated for each level of fishing mortality ( $F$ )).

ya = years ago.

ybp = years before present.

yd = yard (0.914 m).

YE or  $Y_E$  = the yield in weight taken from a fish stock when it is in equilibrium with fishing of a given intensity, and (apart from effects of environmental variation) its biomass is not changing from one year to the next (Ricker, 1975). Also called sustainable yield, equivalent sustainable yield.

YOY = young-of-the-year (members of age group zero, from transformation to juvenile until January 1 in the Northern Hemisphere or July 1 in the Southern Hemisphere (Hubbs, 1943)).

yr = year.

yrs = years.

Z = instantaneous rate of mortality (the natural logarithm (with sign changed) of the survival rate. The ratio of number of deaths per unit of time to population abundance during that time, if all deceased fish were to be immediately replaced so that population does not change (Ricker, 1975). Also called coefficient of decrease).

Z = total mortality rate ( the number of fish which die during a year or season, divided by the initial number. Also called actual mortality rate, coefficient of mortality).

z = instantaneous rate of recruitment (number of fish that grow to catchable size per short interval of time, divided by the number of catchable fish already present at that time. Usually given on a yearly basis, i.e. the figure just described is divided by the fraction of a year represented by the short interval in question. This concept is used principally when the size of the vulnerable stock is not changing or is changing only slowly, since among fishes recruitment is not usually associated with stock size in the direct way in which mortality and growth are (Ricker, 1975)).

Z' = disappearance (the rate of decline in numbers of fish caught as fish become less numerous or less available. Often calculated from catch curves).

Zmbp = level of total mortality at which the maximum biological production is obtained from the stock.

## Symbols

There does not appear to be many symbols peculiar to ichthyology; the following are some general ones that might be encountered, eclectically grouped.

dam = a barrier controlling the flow of water and backing up water. Forms a lacustrine habitat (the reservoir) for fish where one did not exist before. Initially fish production is very high when stocked but declines as nutrients from flooded terrestrial ecosystems are used up. Release of water from reservoirs may radically affect fish downstream by changes in temperature regimes, flushing of habitats, and changes in silt loads. Storage dams store water and diversion dams divert water.

fish cleaning = the act of cleaning a fish for food. Presumably the symbol means that this can be carried out at the designated spot and facilities for waste disposal are available.

fish hatchery = a place or establishment for spawning, incubating and hatching fish eggs and for the rearing of young for release into the wild.

fish ladder = a series of steps with flowing water and pools enabling a fish to circumvent an obstruction such as a dam by leaping from step to step. Also called fishway, fish pass.

fish restaurant = an establishment serving fish as a major food on the menu.

[fish spear](#) = a trident with barbs or flukes is the symbol for the staff of Greek Poseidon or Roman Neptune, gods of the sea.

[fish symbol](#) = ichthus (a representation of a fish; an amulet or talisman shaped like a fish; an iconographic symbol for Christ from the initials in the Greek phrase Iesous Christos Theou Huios Soter (Jesus Christ Son of God Saviour). Also spelt ichthys).

[fishing](#) = capturing of fish (and other aquatic animals) by any and all means for any and all purposes.

[ice fishing](#) = international symbol.

[no fish cleaning](#) = prohibition of the act of cleaning a fish for food.

[no fishing](#) = appears in various forms, usually a fish inside a red circle with a diagonal bar denying permission, as with road signs.

[no ice fishing](#) = prohibition of ice fishing, i.e. fishing through holes cut in the ice of lakes or rivers, using specially designed gear and often with a shack positioned over the hole to mitigate the weather conditions.

[Pisces](#) = the zodiacal sign is two fish swimming in opposite directions. The sun enters this section of the zodiac around February 19, and leaves it on the spring equinox, around March 20.

[zone](#) = 2) a fishing zone is a zone of variable width (up to 200-nautical-miles) proclaimed by a coastal State around its coast, within which it controls domestic and foreign access to fish resources.

<>< = fish, as an e-mail symbol.

& = and (the symbol is called an ampersand).

@ = at.

€ = Cambrian, the earliest period of the Palaeozoic Era, ca. 570-504 million years ago.

% = care of.

≡ = congruence sign, used to indicate objective synonyms (*q.v.*) in nomenclature.

© = 1) copyright.

© = 2) Cambrian Period.

† = crucifix (1) a Christian symbol used before the name of an author to indicate (s)he died before publication or, in an ongoing website with several authors, that this contributor is deceased. Also called a dagger).

† = crucifix (2) in a synonymy, used to indicate a misidentification. Also called a dagger).

† = crucifix (3) a footnote marker. Also called a dagger).

! = exclamation mark. Used on labels, after a museum abbreviation and after a collection number to indicate that the material has been examined by the author of the work.

™ = trade mark.

♀ = female.

♂ = male.

being the male and O being the female. □—O = mating, pairing with □

% = percent ( $10^{-2}$ ).

‰ = permille ( $10^{-3}$ ).

= = equal to, equals, the equals sign. Often used to indicate subjective synonyms in nomenclature.

≠ = not equal to, unequal.

∞ = infinity.

≡ = identical with.

≈ = approximately equal to.

~ = proportional to (tilde).

< = less than.

> = greater than.

<< = much less than.

>> = much greater than.

≤ = less than or equal to.

≥ = greater than or equal to.

+ = plus

- = minus.

× = 1) times, multiplied by.

$\times$  = 2) in nomenclature, used to indicate hybrids between two species with the female parent's scientific name first, e.g. in a hybrid formula *Rutilus rutilus*  $\times$  *Aramis brama*.

\* = times, multiplied by (asterisk on calculators).

· = times, multiplied by.

÷ = divided by.

/ = divided by ((forward stroke on calculators)).

: = divided by (European usage).

± = plus or minus.

# = octothorpe or pound key.

° = degree (of temperature, latitude and longitude).

' = minutes of latitude and longitude.

" = seconds of latitude and longitude.

? = question mark, used to indicate an uncertain identification of a species or other taxon, or to indicate that the a new species is only tentatively assigned to a particular genus - such a name can be validly published.

(....) = 1) round brackets, placed around the author name and date of publication of a scientific name to indicate that the species name or epithet is now placed in a different genus than that of the original description.

(....) = 2) round brackets, placed around a subgenus or former genus name between the genus and species names.

[....] = 1) square brackets, placed around a word or phrase to clarify a quotation taken out of context.

[....] = 2) square brackets, in a citation in a bibliography used to indicate an author originally anonymous or to indicate the date was not given in the work or differs from the one given.

[....] = 3) square brackets, placed around the epithet of a superspecies in the citation of an allospesies (*q.v.*).

## References

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