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Pollachius virens Pollock

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By Thomas Neeson

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Geographic Range

Pollachius virens occurs on both sides of the North Atlantic. In the western Atlantic, their distribution is centered between Cape Cod and the Strait of Canso, while in the eastern Atlantic they are mainly found around Iceland, in the North Sea, and off the northern coast of Norway (Steele 1963). Specimens have been found as far south as North Carolina (Coles 1926), although their abundance is very low at the southern edge of their range. They are native to much of the Atlantic and Arctic Oceans. (Coles, 1926; Steele, 1963)

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Biogeographic Regions: arctic ocean (native) ; atlantic ocean (native)

Habitat

The eggs are pelagic, and are typically found at depths of 50 to 90 m. Juvenile pollock move into the shallow littoral zone for the first two years of life (Steele 1963). Juvenile pollock often use macroalgae in the rocky intertidal zone as a source of refuge and forage during this period (Rangeley and Kramer 1995). Adults leave the shallow littoral zones and swim in large schools throughout the water column. Adults show no substrate preference, but temperature is an important factor. Adults may be found at depths ranging from 5 to 325 m, but more typically between 35 and 130 m (Cargnelli et al. 1999) (Cargnelli, et al., 1999; Rangeley and Kramer, 1995; Rangeley and Kramer, 1998; Steele, 1963)

Habitat Regions: temperate ; saltwater or marine

Aquatic Biomes: pelagic ; coastal

Other Habitat Features: intertidal or littoral

Range depth
5 to 325 m
16.40 to 1066.27 ft

Average depth
35-130 m
ft

Physical Description

Pollock are brownish-green dorsally with the color becoming more pale ventrally. They have a pale, smooth lateral line that is interrupted. The body is fusiform. They have a small chin barbel and a terminal mouth (Cohen et al. 1990). Although there is evidence that some populations may be geographically isolated, there is no evidence that there are any important genetic differences between populations (Mayo et al. 1989). Adult pollock can reach maximum lengths of 130 cm but are usually less than 110 cm (Collette and Klein-MacPhee 2002). Mayo et al. (1989) reported that for the period 1970 to

Classification

- Kingdom
Animalia
animals
- Phylum
Chordata
chordates
- Subphylum
Vertebrata
vertebrates
- Class
Actinopterygii
ray-finned fishes
- Order
Gadiformes
- Family
Gadidae
Cods and haddocks
- Genus
Pollachius
- Species
Pollachius virens
Pollock

1984 mean length was 50.5 cm for males and 47.9 cm for females. O'Brien et al. (1993) reported that for the period 1986 to 1988 mean length was 41.8 cm for males and 39.1 cm for females. This change in size has also been accompanied by a decrease in mean age at maturity (see Development). (Collette and Klein-MacPhee, 2002; Mayo, et al., 1989; O'Brien, et al., 1993)

Other Physical Features: ectothermic ; heterothermic ; bilateral symmetry

Sexual Dimorphism: male larger

Range mass	Average mass	Range length
32 (high) kg	0.5-5 kg	28 to 130 cm
70.48 (high) lb	lb	11.02 to 51.18 in

Average length

45-85 cm
in

Development

Pollock are characterized by a pelagic larval stage that typically lasts between three and four months. When individuals reach 3 cm in length they migrate into the shallow sublittoral zone until near the end of their second year. Individuals are often termed "harbor" pollock at this stage (Steele 1963). At the end of their second year, juveniles move to offshore regions where they will spend most of their adult life (Cargnelli et al. 1999). (Cargnelli, et al., 1999; Mayo, et al., 1989; O'Brien, et al., 1993; Steele, 1963)

Reproduction

Pollock undertake migrations to reach spawning grounds. The largest concentrations of spawning adults occur in Massachusetts Bay, the Stellwagen Bank, Cape Ann to the Isle of

Shoals, the western Gulf of Maine and on the Scotian Shelf (Cargnelli et al. 1999). However, there is little information on the actual spawning event, and no knowledge of mating system (Cargnelli et al. 1999). (Cargnelli, et al., 1999)

Pollock undertake north-south migrations for spawning. Spawning occurs between September and April but peaks between December and February (Cargnelli et al. 1999) . There is more variability in spawning time in northern sites than in southern sites. Spawning occurs over hard bottoms with stony or rocky surfaces, and is highly dependent on temperature. Spawning begins when water temperatures fall below 8 C, and peaks when temperatures are below 4.5 to 6 C. Spawning is reported to occur at salinities of 32 to 32.8 ppt (Collette and Klein-MacPhee 2002). Fecundity per female ranges from 200,000 to 8,260,000 eggs. Incubation time of eggs ranges from 5 to 15 days, and optimal development occurs at 8.9 C (Cargnelli et al. 1999). (Cargnelli, et al., 1999; Collette and Klein-MacPhee, 2002)

Mayo et al. (1989) reported that for the period 1970 to 1984 mean age at maturity was 3.5 years for males and 3.2 years for females. O'Brien et al. (1993) reported that for the period 1986 to 1988 mean age at maturity had dropped to 2.3 years for males and 2.0 years for females. (Mayo, et al., 1989; O'Brien, et al., 1993)

Key Reproductive Features: iteroparous ; seasonal breeding ; gonochoric/gonochoristic/dioecious (sexes separate) ; sexual ; fertilization (external) ; oviparous

Breeding interval	Breeding season	Range number of offspring
Pollock breed once yearly after reaching sexual maturity.	Spawning occurs between September and April, and is concentrated between December and February.	200,000 to 8,260,000

Range time to hatching

5 to 15 days

Average age at sexual or reproductive maturity (female)

2.0 years

Average age at sexual or reproductive maturity (female)**Sex: female**

730 days

[AnAge](#)**Average age at sexual or reproductive maturity (male)**

2.3 years

Average age at sexual or reproductive maturity (male)**Sex: male**

839 days

[AnAge](#)

Parents provide no care for the young, and eggs rise in the water column and drift after fertilization. Young have a yolk sack that is absorbed after approximately five days. The rate at which yolk is absorbed is temperature dependent (Steele 1963).

Parental Investment: no parental involvement ; pre-fertilization (provisioning , protecting : female)

Lifespan/Longevity

Maximum reported age in pollock is 25 years. A more typical lifespan is 10 years. The majority of fish caught, however, range between 3 and 6 years of age (Mayo 1994). ([Mayo, 1994](#))

**Range lifespan
Status: wild**

25 (high) years

**Typical lifespan
Status: wild**

10 (high) years

**Average lifespan
Status: captivity**

25 years

[AnAge](#)

Behavior

Pollock are a schooling species for the adult portion of their lifespan and are mainly in open waters during this time. Distribution changes seasonally and is related to water temperatures, depth, and feeding (Steele 1963). There is some evidence of a seasonal north-south migration within their range, particularly during breeding season. Some studies have found that there is relatively little movement during the summer (non-breeding) season (Bigelow and Schroeder 1953). Adults migrate to shallower waters to spawn. Eggs and larvae are free-floating. Juveniles move in to shallow waters for the first two years of life, but may move offshore to avoid warm temperatures. (Bigelow and Schroeder, 1953; Steele, 1963)

Key Behaviors: natatorial ; motile ; migratory ; social

Home Range

There is no information on home range in pollock.

Communication and Perception

Pollock rely on their lateral line system for schooling. Pitcher et al. (1976) covered the eyes of schooling pollock with opaque patches to demonstrate that vision is not necessary for schooling behavior. However pollock are not able to school if their lateral line has been severed, evidence that it is important for schooling. Pollock may use vision for prey detection and capture and for mating. (Pitcher, et al., 1976)

Perception Channels: visual ; tactile ; chemical

Food Habits

Food sources differ between life history stages. Larval pollock subsist initially on yolk contained in egg sacks. Small larvae consume larval copepods, while larger larvae consume adult copepods (Steele 1963). Juvenile pollock subsist mainly on crustaceans, particularly the euphausiid *Meganyctiphanes norvegica* (Collette and Klein-MacPhee 2002), and to a lesser degree on fish and mollusks. Adults feed on crustaceans, fish,

and mollusks as well, but the relative importance of these varies with the size of individual. The smallest adults (41 to 65 cm) feed primarily on crustaceans, medium size adults (66 to 95 cm) feed mainly on fish such as Atlantic herring *Clupea harengus*, while the largest adults (> 95 cm) feed on mollusks such as squid *Loligo* (Bowman and Michaels 1984). (Bowman and Michaels, 1984; Collette and Klein-MacPhee, 2002; Steele, 1963)

Primary Diet: carnivore (piscivore , eats non-insect arthropods , molluscivore)

Animal Foods: fish ; mollusks ; aquatic crustaceans

Predation

Major predators include seals, sea lions, whales, dolphins, and other large bony fish. Human fishing operations play a significant role in pollock mortality, and there is speculation that overfishing may be causing the decrease in age at maturity observed by Cargnelli et al. (1999). Adults and juveniles exhibit schooling as an anti-predator defense. Rangeley and Kramer (1998) found that schooling and habitat selection are important anti-predator strategies in juveniles; juveniles spend more time in algae beds in the presence of a predator. Juveniles that remain in the open were more likely to aggregate in the presence of a predator. (Cargnelli, et al., 1999; Rangeley and Kramer, 1998)

Known Predators

- seals (*Phocidae*)
- sea lions (*Otariidae*)
- toothed whales (*Odontoceti*)
- dolphins (*Delphinidae*)
- large bony fish (*Actinopterygii*)

Ecosystem Roles

Pollock are an important predator in many ecosystems due to their population size and density. They play an important role in population dynamics for some crustaceans, fish, and mollusks (see 'Food Habits'). Sea lampreys *Petromyzon marinus* parasitize pollock.

Commensal/Parasitic Species

- Sea lampreys *Petromyzon marinus*

Economic Importance for Humans: Positive

Pollock are an extremely important fish in commercial fisheries, and commercial fisheries on both sides of the Atlantic are well developed. The degree to which pollock are integrated into the fisheries of many nations is evidenced by the several dozen common names in several languages for *P. virens*. They are also an important gamefish (Steele 1963). (Steele, 1963)

Positive Impacts: food

Economic Importance for Humans: Negative

There are no negative impacts of Atlantic pollock on humans.

Conservation Status

Habitat loss or degradation of nearshore intertidal zones that serve as a refuge for juvenile pollock are a current concern, and there is a call for more research related to this topic (Cargnelli et al. 1999). There is some speculation that these habitats may be a bottleneck restricting population size. There are additional concerns regarding the effect of overfishing on pollock population sizes. After catch rates increased steadily throughout the 1970s and early 1980s, catch rates dropped 82% between 1986 and 1996 (Mayo 1998). This was accompanied by a 36% decrease in spawning stock biomass between 1986 and 1994. There is speculation that overfishing may be causing important changes in population structure as well, for example the decrease in mean age at maturity and mean size at maturity observed by Caragnelli et al. (1999). (Cargnelli, et al., 1999; Mayo, 1998)

IUCN Red List

Not Evaluated

US Federal List

No special status

CITES

No special status

Other Comments

Alaskan Pollock is a separate species (*Theragra chalcogramma*).

Atlantic Pollock are known by various common names including saithe, coalfish, billet, and many others.

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