

= Atlantic blue marlin =

The Atlantic blue marlin (*Makaira nigricans*) is a species of marlin endemic to the Atlantic Ocean . The Atlantic blue marlin (hereafter , blue marlin) feeds on a wide variety of organisms near the surface . It uses its bill to stun , injure , or kill while knifing through a school of fish or other prey , then returns to eat the injured or stunned fish . Marlin is a popular game fish . The relatively high fat content of its meat makes it commercially valuable in certain markets . It is the national fish of the Commonwealth of the Bahamas and is thus featured on its Coat of Arms .

Blue marlin are distributed throughout the tropical and subtropical waters of the Atlantic , Indian , and Pacific Oceans . A bluewater fish that spends the majority of its life in the open sea far from land , the blue marlin preys on a wide variety of marine organisms , mostly near the surface , often using its bill to stun or injure its prey .

Females can grow up to four times the weight of males . The maximum published weight is 818 kg (1 @,@ 803 lb) and length 5 m (16 @.@ 4 ft) .

Adult blue marlin have few predators apart from man . They are sought after as a highly prized game fish by anglers and are taken by commercial fishermen , both as a directed catch and as bycatch in major industrial tuna fisheries . Blue marlin are currently considered a threatened species by the IUCN due to overfishing .

Some other historic English names for the blue marlin are Cuban black marlin , ocean gar , and ocean guard .

= = Taxonomy and naming = =

The blue marlin is placed in the genus *Makaira* . This name is derived from the Greek word *machaira* , meaning " a short sword or bent dagger " , and the Latin *machaera* , " sword " . The specific epithet *nigricans* is Latin for " becoming black " . The blue marlin is part of the billfish family *Istiophoridae* and is in the perch @-@ like order *Perciformes* . In addition , it is in the suborder *Xiphoidei* and is a member of the subclass *Neopterygii* , which means " new wings " . It is also in the class of *Actinopterygii* , which includes ray @-@ finned fishes and spiny @-@ rayed fishes , and the superclass *Osteichthyes* , which includes all of the bony fishes .

The classification of the Atlantic blue marlin (*Makaira nigricans*) and the Indo @-@ Pacific blue marlin (*Makaira mazara*) as separate species is under debate . Genetic data suggest , although the two groups are isolated from each other , they are both the same species , with the only genetic exchange occurring when Indo @-@ Pacific blue marlin migrate to and contribute genes to the Atlantic population . A separate study by V. P. Buonaccorsi , J. R. McDowell , and Graves indicated that both Indo @-@ Pacific and Atlantic show " striking phylogeographic partitioning " of mitochondrial and microsatellite loci .

= = = Synonyms = = =

Synonyms of *Makaira nigricans* are :

Maikaira nigricans (sic) Lacepède , 1802

Makaira nigricans nigricans Lacepède , 1802

Xiphias ensis Lacepède , 1800 (ambiguous)

Makaira ensis (Lacepède , 1800) (ambiguous)

Tetrapturus herschellii J. E. Gray , 1838

Histiophorus herschellii (J. E. Gray , 1838)

Makaira herschellii (J. E. Gray , 1838)

Tetrapturus amplus Poey , 1860

Makaira ampla (Poey , 1860)

Makaira ampla ampla (Poey , 1860)

Makaira nigricans ampla (Poey , 1860)

Tetrapturus mazara D. S. Jordan & Snyder , 1901

Istiompax mazara (D. S. Jordan & Snyder , 1901)
Makaira ampla mazara (D. S. Jordan & Snyder , 1901)
Makaira mazara (D. S. Jordan & Snyder , 1901)
Makaira nigricans mazara (D. S. Jordan & Snyder , 1901)
Makaira bermudae Mowbray , 1931
Orthocraeros bermudae (Mowbray , 1931)
Eumakaira nigra Hirasaka & H. Nakamura , 1947
Makaira nigra (Hirasaka & H. Nakamura , 1947)
Makaira perezii F. de Buen , 1950
Istiompax howardi Whitley , 1954

== Description ==

The biggest females are more than four times as heavy as the biggest males , which rarely exceed 160 kg (350 lb) in weight . The longest females can reach a length of 5 m (16 ft) with the bill , from eye to tip , constituting about 20 % of the total body length .

Body mass in the largest female specimens has been reported from 540 to 820 kg (1 @, @ 190 to 1 @, @ 810 lb) , depending on the source (few large specimens are scientifically verified) . The largest blue marlin caught by IGFA angling rules is from Vitoria , Brazil , which weighed 1 @, @ 402 lb (636 kg) . ; fishermen often refer to individual marlins that reach or exceed 1 @, @ 000 pounds as " granders " .

Both sexes have 24 vertebrae , of which 11 are precaudal and 13 are caudal .

The marlin has two dorsal fins and two anal fins . The fins are supported by bony spines known as rays . Its first dorsal fin has 39 to 43 rays from front to back . Its second dorsal fin has six or seven rays . Its first anal fin , which is similar in shape and size to the second dorsal fin , has 13 to 16 rays , and the second anal fin has six or seven rays . The pectoral fins , which have 19 to 22 rays , are long and narrow and can be drawn in to the sides of the body . The pelvic fins are shorter than the pectorals , have a poorly developed membrane , and are depressible into ventral grooves . Its first anal fin , along with its pectoral and caudal fins , can be folded into grooves . This streamlines the fish and thereby reduces drag .

Blue marlin , like other billfish , can rapidly change color , an effect created by pigment @-@ containing iridophores and light @-@ reflecting skin cells .

Most often , however , the body is blue @-@ black on top with a silvery white underside . It has about 15 rows of pale , cobalt @-@ colored stripes , each of which has round dots and / or thin bars , located on both sides of the fish . The first dorsal fin membrane is dark blue or almost black and has no dots or marks . Other fins are normally brownish @-@ black , sometimes with a hint of dark blue . The bases of the first and second anal fins have a hint of silvery white .

The body is covered with thick , bony , elongated scales that have one , two , or three posterior points , with one being the most common form .

The bill is long and stout . Both the jaws and the palatines (the roof of the mouth) are covered with small , file @-@ like teeth . The lateral line system is a group of neuromasts rooted in lateral line canals that can sense weak water motions and large changes in pressure . It has the appearance of a net . It is obvious in immature specimens but unclear in adults , becoming progressively embedded in the skin . The anus is just in front of the origin of the first anal fin .

== Range and migration ==

Blue marlin are found year @-@ round in tropical oceanic waters of the Atlantic and Indo @-@ Pacific . The range expands into temperate waters of the Northern and Southern Hemispheres during the warmer months and contracts towards the Equator during colder months . Warm currents such as the Gulf Stream in the western Atlantic and the Agulhas Current in the western Indian Ocean have a major influence on their seasonal distribution .

In the Atlantic , the blue marlin 's latitudinal range extends from about 45 ° N to about 35 ° S. It is

less abundant in the eastern Atlantic , where it mostly occurs off Africa between the latitudes of 25 ° N and 25 ° S. The largest numbers are usually found in waters warmer than 24 ° C (75 ° F) , but blue marlin have been found at surface water temperatures as high as 30 @. @ 5 ° C (86 @. @ 9 ° F) and as low as 21 @. @ 7 ° C (71 @. @ 1 ° F) .

Tagging studies , using conventional " spaghetti " tags , and more recently pop @-@ up satellite tags , have given researchers a glimpse into blue marlin migration patterns and habits . Recaptures of tagged fish have shown multiple movements between the Caribbean Islands and Venezuela and the Bahamas , as well as between the Caribbean Saint Thomas , U.S. Virgin Islands and West Africa , as well interocean travel . Most notably , a blue marlin tagged off the coast of Delaware was recovered near the island of Mauritius off the southeast coast of Africa in the Indian Ocean ? a voyage of 9 @, @ 254 miles . Blue marlin tagged in the Pacific have also been recovered in the Indian Ocean . Several fish have been recaptured in the same general area where they were tagged , implying reverse migration after / over several years , but the data are insufficient to accurately determine seasonality .

= = Predators and parasites = =

Once blue marlin reach maturity , they have few predators , with the most important probably being large pelagic sharks such as the shortfin mako and great white shark .

Blue marlin have many parasites . They include parasites from these groups : Digenea (flukes) , Didymozoida (tissue flukes) , Monogenea (gillworms) , Cestoda (tapeworms) , Nematoda (roundworms) , Acanthocephala (spiny @-@ headed worms) , copepods , barnacles , and cookiecutter sharks .

Remoras are commonly found attached to blue marlin , often inside the opercula .

= = Lifecycle = =

Growth and maturity

Atlantic blue marlin reach sexual maturity at the age of two to four years . Males reach sexual maturity at a weight of 35 ? 44 kg (77 ? 97 lb) and females at 47 ? 61 kg (104 ? 134 lb) . Blue marlin breed in late summer and fall . Females may spawn as many as four times in one season . They often release over seven million eggs at once , each about 1 mm (0 @. @ 039 in) in diameter . Few reach sexual maturity . The planktonic young drift freely in the ocean 's pelagic zone . Larvae inhabit the west central Atlantic off Georgia , North Carolina , Florida , Jamaica , Bahamas , the Dominican Republic , and Puerto Rico , and also the southwest Atlantic off Brazil . The larvae may grow as much as 16 mm (0 @. @ 63 in) in a day . On their sides and dorsal surfaces they are blue @-@ black in color , while ventrally they are white . Both the caudal fin and the caudal peduncle (the narrow part of the fish 's body to which the caudal or tail fin is attached) are clear . Two iridescent blue patches occur on the head , and some individuals have darker spots on their backs . In adolescents , the first dorsal fin is large and concave , gradually reducing in proportion to body size with continued growth . Males may live for 18 years , and females up to 27 .

Diet and feeding

The larvae feed upon a variety of zooplankton along with drifting fish eggs and other larvae . They progress to feeding on a wide range of fishes , particularly scombrids , such as mackerel and tuna , squid , and especially near oceanic islands and coral reefs , on juvenile inshore fish . Studies of stomach contents in both the Atlantic and Pacific have found that smaller schooling scombrids such as frigate mackerel , bullet tuna , and skipjack tuna make up a substantial proportion of their diet . Squid and deep @-@ sea fishes such as pomfret and snake mackerel are also important prey items in certain areas . Blue marlin have been recorded to take prey as large as white marlin , as well as yellowfin and bigeye tuna in the 100 @-@ lb range . Conversely , they are also capable of feeding on small but numerous prey such as filefish and snipefish .

Scientists and fishermen have long debated the extent to which blue marlin and other billfish use their elongated upper jaw in feeding . A 2007 Japanese study of stomach contents of fish captured

in a commercial trolling fishery found that 130 undigested prey items obtained from 227 blue marlin had spearing , slashing , and other injuries that were judged to have been inflicted by the bill .

= = Economic importance = =

= = = Commercial fishery = = =

Marlin has commercial value throughout the world , with landings totalling 3 @, @ 064 metric tons in 2000 . It is particularly valued in Japan for sashimi . In Hawaii , where the fish is known as a 'u , blue marlin meat is sometimes smoked and sold by roadside vendors .

Blue marlin are often caught as bycatch in tuna longline fisheries .

= = = Recreational fishery = = =

Sport fishermen first encountered blue marlin in the Bahamas in the 1920s and early 1930s , when pioneering big @-@ game fishermen such as Van Campen Heilner and S. Kip Farrington began exploring the waters offshore of Bimini and Cat Cay . In the Pacific , blue marlin (then known as silver marlin or often misidentified as the related black marlin) were caught by author / angler Zane Grey in Tahiti in the 1930s . Since then , blue marlin have been renowned as one of the world 's greatest game fishes . The sportfishing pursuit of marlin and other billfish has developed into a multimillion dollar industry that includes hundreds of companies and thousands of jobs for boat operators , boat builders , marinas , dealerships , and fishing tackle manufacturers and dealers .

The most established sport fisheries for blue marlin are found along the eastern seaboard and the Gulf Coast of the United States , Bermuda , the Bahamas. and several other Caribbean islands (notably St Thomas and Puerto Rico) . Recreational fishing for blue marlin also takes place in Brazil , Venezuela , and the Atlantic coast of Mexico , particularly the Yucatan peninsula . In the eastern Atlantic , blue marlin sport fisheries exist from the Algarve coast of Portugal in the north to Angola in the south and include the islands of the Azores , Canaries , Cape Verde , Madeira , and Ascension Island .

The International Game Fish Association all @-@ tackle world record for blue marlin currently stands at 1 @, @ 402 lb 2 oz (636 kg) . This fish was captured in Vitoria , Brazil .

= = Conservation = =

The blue marlin is under intense pressure from longline fishing . In the Caribbean region alone , Japanese and Cuban fishermen annually take over a thousand tons . All vessels within 200 mi (320 km) of the U.S. coastline are required to release any billfish caught . However , the survival rate of released fish is low because of damage during capture .

Makaira nigricans is listed as a threatened species by the International Union for Conservation of Nature . In 2010 , Greenpeace International added the blue marlin to its seafood red list .

Sport fishermen have been at the forefront of efforts to conserve blue marlin populations . The initial efforts to develop electronic tags for tracking highly migratory fish were carried out on marlin in Hawaii , in collaboration with anglers in the Hawaiian International Billfish Tournament .

= = In popular culture = =

Both Zane Grey and Ernest Hemingway , who fished for blue marlin off the Florida Keys , the Bahamas , and most famously in Cuba , wrote extensively about their pursuit .

In Ernest Hemingway 's novella *The Old Man and the Sea* , a fisherman named Santiago battles a blue marlin for three days off the coast of Cuba .