

= Night shark =

The night shark ( *Carcharhinus signatus* ) is a species of requiem shark , in the family Carcharhinidae , found in the temperate and tropical waters of the Atlantic Ocean . An inhabitant of the outer continental shelf and upper continental slope , this shark most commonly occurs at depths of 50 ? 600 m ( 160 ? 1 @, @ 970 ft ) and conducts a diel vertical migration , spending the day in deeper water and moving into shallower waters at night . Off northeastern Brazil , large numbers congregate around seamounts of varying depth . A slender , streamlined species , the night shark typically reaches a length of 2 m ( 6 @. @ 6 ft ) . It can be identified by its long pointed snout and large green eyes ( when alive ) , and is dark grayish blue or brown above and white below .

Night sharks are quick , nocturnally active , schooling predators that feed mainly on small bony fishes and squid . Reproduction is viviparous as with the other members of its family ; females mate during the summer and give birth to litters of usually 12 ? 18 pups after a gestation period of a year . This deepwater species is not known to pose a danger to humans . It is caught incidentally by commercial tuna and swordfish longline fisheries in the western Atlantic , and also by a targeted longline fishery operating off northeastern Brazil . The night shark is highly valued for its fins , and additionally as a source of meat , liver oil , and fishmeal . However , most sharks caught off northeastern Brazil have been found to contain unsafe concentrations of mercury .

Because of its low reproductive rate and historically documented declines in areas such as the Caribbean , the night shark has been assessed as Vulnerable by the International Union for Conservation of Nature ( IUCN ) and the American Fisheries Society ( AFS ) . A population assessment has indicated that this species is secure in the waters off the United States , but this may not be true elsewhere .

= = Taxonomy = =

The first scientific description of the night shark was published by Cuban zoologist Felipe Poey in 1868 , as part of a series of papers entitled Repertorio fisico @-@ natural de la isla de Cuba . He based his description on a single set of jaws and gave it the name *Hypoprion signatus* . In 1973 , Leonard Compagno synonymized the genus *Hypoprion* with *Carcharhinus* . No type specimen has been designated for this species . Its common name comes from the fact that it is mostly captured at night .

= = Distribution and habitat = =

The distribution of the night shark extends along the outer continental shelves and upper continental slopes of the Atlantic Ocean , from the U.S. state of Massachusetts to Argentina in the west , including the Gulf of Mexico and the Caribbean Sea , and from Senegal to northern Namibia in the east . In United States waters , it is relatively common off North Carolina and Florida ( particularly the Florida Straits ) and rarer elsewhere . There are questionable reports of this species off the Pacific coast of Panama .

The night shark is a deepwater species that has been reported from as far down as 2 km ( 1 @. @ 2 mi ) , though it occasionally ventures to within 26 m ( 85 ft ) of the surface . Off the southeastern United States , it is usually caught at a depth range of 50 ? 600 m ( 160 ? 1 @, @ 970 ft ) . Off northeastern Brazil , the night shark is most commonly found near the summits of seamounts ranging from 38 m ( 125 ft ) to 370 m ( 1 @, @ 210 ft ) deep . Off West Africa , it occurs at depths of 90 ? 285 m ( 295 ? 935 ft ) , where the temperature is 11 ? 16 ° C ( 52 ? 61 ° F ) , the salinity is 36 ppt , and the dissolved oxygen level is 1 @. @ 81 ml / l . Annual variation in Cuban catch rates may indicate a seasonal migration .

= = Description = =

The night shark has a slender build with an elongated , pointed snout . The nares are flanked by

moderately developed flaps of skin . The eyes are large , circular , and green in life , with irregularly shaped pupils and a nictitating membrane ( protective third eyelid ) . The mouth lacks conspicuous furrows at the corners and usually bears 15 tooth rows on either side of both jaws , plus 1 ? 2 upper and 1 lower symphysial ( jaw midline ) tooth rows . Each upper tooth has a smooth to serrated edge , a narrow cusp becoming more oblique towards the corner of the mouth , and 2 ? 5 coarse serrations at the base of the trailing margin . The number and size of serrations on the leading margin of the tooth cusp increase relative to those on the trailing margin as the animal grows older . The lower teeth are upright and smooth @-@ edged . The five pairs of gill slits are rather short .

The pectoral fins are less than a fifth as long as the total body length and taper towards a somewhat rounded tip . The first dorsal fin is relatively small , triangular , and pointed , originating over the free rear tips of the pectoral fins . The second dorsal fin is much smaller than the first and originates over or slightly ahead of the anal fin . There is a ridge running between the dorsal fins . The dermal denticles are not tightly packed and overlap each other minimally . Each denticle is diamond @-@ shaped with horizontal ridges leading to marginal teeth , the number increasing from 3 in juveniles to 5 ? 7 in adults . The coloration is grayish blue or brown above and whitish below , without fin markings . There is a faint band on each side and sometimes small black spots scattered over the back . This species usually grows to 2 @. @ 0 m ( 6 @. @ 6 ft ) long , but has been recorded reaching a length and weight of 2 @. @ 8 m ( 9 @. @ 2 ft ) and 76 @. @ 7 kg ( 169 lb ) respectively .

#### = = Biology and ecology = =

Fast and energetic , the night shark feeds primarily on small , active bony fishes such as mullet , mackerel , butterfish , sea basses , and flyingfish . Squid and shrimp are also sometimes taken . Most feeding activity occurs at night , hence its common name , with peaks at dawn and dusk . Catch records indicate that this species is usually found in schools and conducts a diel vertical migration , spending the day at a depth of 275 ? 366 m ( 902 ? 1 @, @ 201 ft ) and moving up to shallower than 183 m ( 600 ft ) at night . Ovulating and gravid females are rarely ever caught , suggesting that during this period they may stop feeding or segregate themselves from others of their species . Potential predators of the night shark include larger sharks . Known parasites include the copepods *Kroyeria caseyi* , which attach to the gills , *Pandarus bicolor* and *P. smithii* , which infest the skin , and the tapeworms *Heteronybelinia yamagutii* , *H. nipponica* and *Progrillotia dollfusi* , which are found in the spiral valve intestine . Another parasite is an undescribed isopod similar to *Aega webbii* . The common remora ( *Remora remora* ) may be found attached to this species .

Like other members of its family , the night shark is viviparous : once the developing embryos exhaust their supply of yolk , the depleted yolk sac is converted into a placental connection through which the mother delivers nourishment . Adult females have a single functional ovary ( on the right ) and two functional uteruses , which are divided into separate compartments for each embryo . Within the uterus the embryos lie lengthwise with their heads pointing the same direction as their mother . Most information known about the night shark 's life history comes from the subpopulation off northeastern Brazil , and may not hold true in other parts of the species range . Northeastern Brazilian sharks mate throughout the summer , with the males biting at the female 's body and fins as a prelude to copulation .

After a year @-@ long gestation period , females give birth to 4 ? 18 ( usually 12 or more ) pups . Embryos at varying stages of development have been found in both February and June , suggesting that the parturition takes place over a span of several months . An important nursery area is believed to exist at the continental shelf break at 34 ° S latitude , near the southern extreme of this species ' range . The newborn young measure 50 ? 72 cm ( 20 ? 28 in ) long , and add around 25 cm ( 9 @. @ 8 in ) or 38 % of their body length in their first year . This fast rate of growth serves to shorten the period immediately after birth when the small pups are most vulnerable to predators , a strategy similar to that employed by the silky shark ( *C. falciformis* ) . By the time the sharks reach adulthood , the growth rate slows to a more modest 8 @. @ 6 cm ( 3 @. @ 4 in ) per year . There is no difference in growth rate between sexes . Males mature sexually at a length of 1 @. @ 8 ? 1

0.9 m ( 5 @ 9 ? 6 @ 2 ft ) , corresponding to an age of 8 years , and females at a length of 2 @ 0 ? 2 @ 1 m ( 6 @ 6 ? 6 @ 9 ft ) , corresponding to an age of 10 years . The oldest known individuals are 17 years old ; based on growth curves the maximum lifespan has been estimated at 28 years for males and 30 years for females .

= = Human interactions = =

Because of its deepwater habitat , the night shark is not known to pose a danger to humans . This species is prized for its large fins , which are exported for use in shark fin soup , and is also utilized as a source of meat , liver oil , and fishmeal . Traditionally it has comprised a part of the bycatch of pelagic longline fisheries targeting swordfish ( *Xiphius gladius* ) and tuna in the western Atlantic . Since 1991 , it has also been the focus of a longline fishery operating over seamounts off northeastern Brazil , where large numbers of sharks congregate and are easily captured . Some 90 % of the seamount shark and ray catch in this area now consists of night sharks ; of those approximately 89 % are juveniles . However , a study has found that night sharks from off northeastern Brazil accumulate high levels of mercury within their bodies , likely from their piscivorous diet . Some 92 % of sharks examined contained mercury levels higher than that allowed for marketed carnivorous fish set by the Brazilian legislature , and the average mercury concentration was 1 @ 742 mg / kg . Therefore , eating only 0 @ 1 kg ( 0 @ 22 lb ) of night shark meat per day could result in the ingestion of several times the daily mercury content judged safe by the World Health Organization .

The International Union for Conservation of Nature ( IUCN ) has assessed the night shark globally as Vulnerable , citing its slow reproductive rate and historical declines under fishing pressure . It has also been listed as Vulnerable by the American Fisheries Society ( AFS ) . This species was once a significant part of the Cuban artisanal shark fishery , comprising 60 ? 75 % of the catch from 1937 to 1941 , before its numbers dropped substantially in the 1970s . Similarly , the proportion of night sharks in the shark catch of the southeastern U.S. pelagic longline fishery fell from 26 @ 1 % from 1981 to 1983 to 0 @ 3 ? 3 @ 3 % in 1993 and 1994 ; a comparable decline was observed in catches by south Florida marlin tournaments since the 1970s . Currently , the intense Brazilian targeted fishery is of particular concern , although fishing pressure on the night shark may be relaxing as the fishery is beginning to shift towards swordfish and bigeye tuna ( *Thunnus obesus* ) . No fishery information on the night shark is available for the eastern Atlantic , leading to an IUCN assessment of Data Deficient for that region .

In 1997 , the U.S. National Oceanographic and Atmospheric Administration ( NOAA ) National Marine Fisheries Service ( NMFS ) listed the night shark as a " Species of Concern " , meaning that it merits conservation concern but there is insufficient evidence for listing on the Endangered Species Act ( ESA ) . In 1999 , the NMFS Fishery Management Plan ( FMP ) of the Atlantic tunas , swordfish , and sharks was revised to prohibit the retention of 19 species , including the night shark . The prohibition of this species was upheld by Amendment 1 of the FMP , added in 2003 . Night sharks suffer high bycatch mortality on longlines , and prohibited or not some are kept by fishers because of their value and the difficulty of identifying disembodied parts to species . Nevertheless , a 2003 ? 2008 NMFS population assessment concluded that night shark population in United States waters has stabilized ( perhaps even increasing ) and no longer merits categorization as a " Species of Concern " , though recommended that the prohibition on retention be maintained as a precautionary measure . This species should also benefit from the imposition of time / area closures in the Florida Straits and on the Charleston Bump . Off Brazil and elsewhere , fishing continues largely unmanaged . IUCN members have urged that Brazil improve catch monitoring and enforcement of existing regulations , declare some critical habitat off @-@ limits , and implement the Brazilian National Plan of Action for Sharks ( NPOA @-@ Sharks ) under the FAO International Plan of Action for the Conservation and Management of Sharks ( IPOA @-@ Sharks ) .