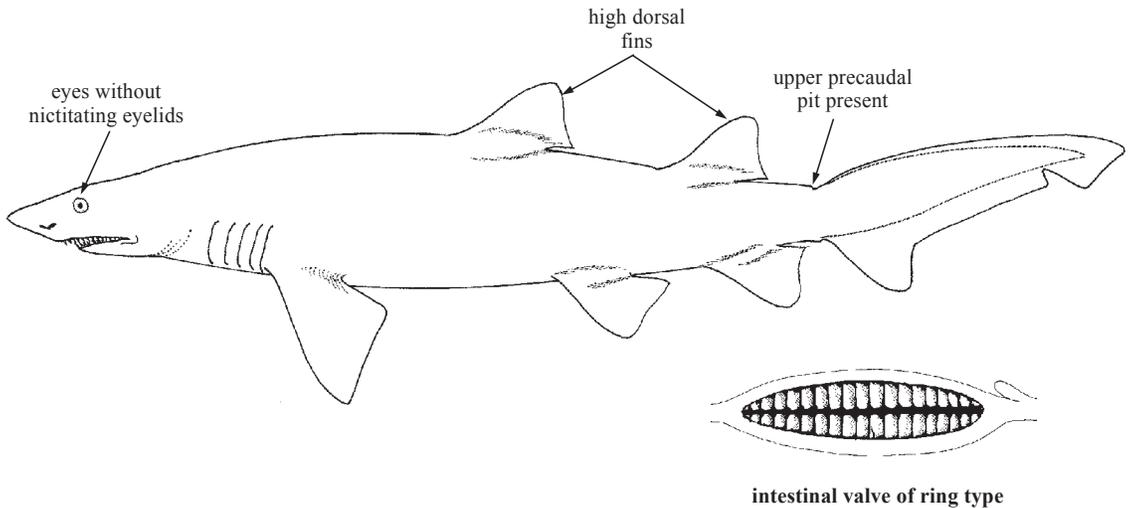


## Order LAMNIFORMES

## ODONTASPIDIDAE

## Sand tiger sharks

**Diagnostic characters:** Large sharks. Head with 5 medium-sized gill slits, all in front of pectoral-fin bases, **their upper ends not extending onto dorsal surface of head; eyes small or moderately large, without nictitating eyelids; no nasal barbels or nasoral grooves;** snout conical or moderately depressed, not blade-like; mouth very long and angular, extending well behind eyes when jaws are not protruded; **lower labial furrows present at mouth corners;** anterior teeth enlarged, with long, narrow, sharp-edged but unserrated cusps and small basal cusplets (absent in young of at least 1 species), the upper anteriors separated from the laterals by a gap and tiny intermediate teeth; gill arches without rakers; spiracles present but very small. Two moderately large **high dorsal fins, the first dorsal fin originating well in advance of the pelvic fins,** the second dorsal fin as large as or somewhat smaller than the first dorsal fin; anal fin as large as second dorsal fin or slightly smaller; caudal fin short, asymmetrical, with a strong subterminal notch and a short but well marked ventral lobe. Caudal peduncle not depressed, **without keels; a deep upper precaudal pit present but no lower pit.** Intestinal valve of ring type, with turns closely packed like a stack of washers. **Colour:** grey or grey-brown to blackish above, blackish to light grey or white, with round or oval dark spots and blotches variably present on 2 species.



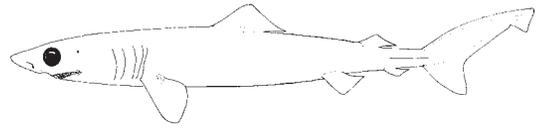
**Habitat, biology, and fisheries:** Wide-ranging, tropical to cool-temperate sharks, found inshore and down to moderate depths on the edge of the continental shelves and around some oceanic islands, and in the open ocean. Development is ovoviparous (aplacental viviparous) as far as known. They feed on bony fishes, other sharks, squids, and occasionally bottom crustaceans. Normally inoffensive, occasionally biting people, 2 species are popular as subjects of ecotouristic diving and 1 as an aquarium exhibit. In Area 31, *Carcharias taurus* is regularly caught for food, liver oil, and processed for fish meal. Two species of *Odontaspis* are rarely caught in the area and are not utilized commercially.

**Similar families occurring in the area**

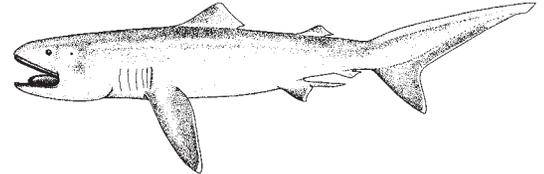
**Pseudocarchariidae:** the wide-ranging oceanic crocodile shark (*Pseudocarcharias kamoharai*) is virtually circumtropical in distribution. It is currently not known from Area 31 but is likely to occur here as it has been caught off northern Brazil and in the eastern Atlantic. It differs from Odontaspidae in having a slimmer body, gill slits higher and reaching onto dorsal sides of head, eyes larger, no true labial furrows, dorsal and anal fins lower, a weak lateral keel on caudal peduncle, both upper and lower precaudal pits present, and in reaching a size of less than 1.3 m.

**Megachasmidae:** the rare but wide-ranging oceanic megamouth shark (*Megachasma pelagios*) may be circumtropical in distribution but is currently known from spotty records in the Pacific (Japan, California, Indonesia, Philippines, and Hawaii), South Africa, Indian Ocean off Australia, and in the Atlantic off Senegal and southern Brazil. This giant plankton-feeding shark is currently not known from Area 31 but is to be expected here. It differs from Odontaspidae in having a very short, broadly rounded snout, huge terminal mouth with numerous small, hooked teeth in both jaws, very long head, gill-raker papillae on its internal gill slits, narrow leaf-shaped pectoral fins with origins under third gill slits, a soft, flabby body, and in attaining a larger size, 4.5 to 5.4 m long.

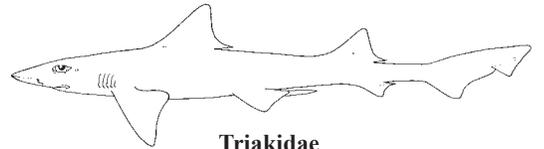
**Proscylliidae, Triakidae, and Carcharhinidae:** nictitating eyelids present, anterior teeth not greatly enlarged, no intermediate teeth between anteriors and laterals, intestinal valve of spiral or scroll type.



**Pseudocarchariidae**



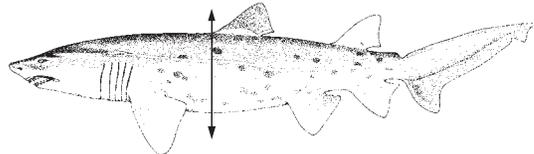
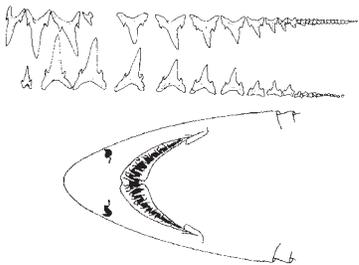
**Megachasmidae**



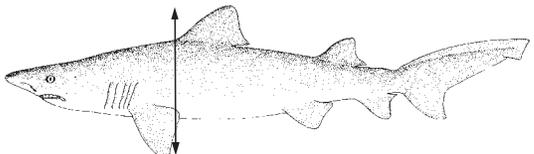
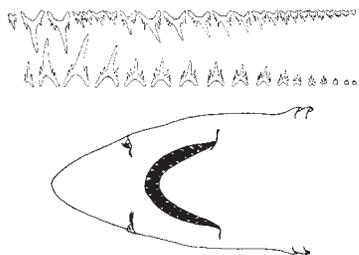
**Triakidae**

**Key to the species of Odontaspidae occurring in the area**

- 1a. Snout short and somewhat flattened; eyes very small; 3 rows of anterior teeth on either side of upper symphysis; dorsal and anal fins about equal in size, first dorsal fin closer to pelvic-fin than to pectoral-fin bases (Fig. 1) . . . . . *Carcharias taurus*
- 1b. Snout longer, bulbous and conical; eyes large; 2 rows of large anterior teeth on either side of upper symphysis; first dorsal fin markedly larger than the second, closer to pectoral-fin than to pelvic-fin bases; second dorsal fin larger than anal fin (Fig. 2) . . . . . (*Odontaspis*) → 2

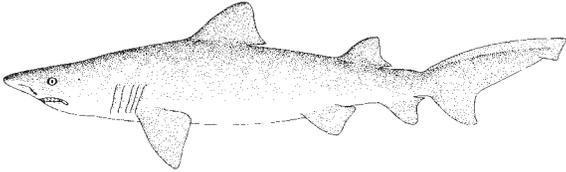
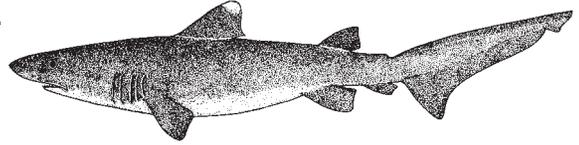


**Fig. 1 *Carcharias taurus* teeth, ventral view of head, and lateral view of body**



**Fig. 2 *Odontaspis* teeth, ventral view of head, and lateral view of body**

- 2a. Anal fin high; teeth with mostly 2 or 3 cusplets on each side; 3 to 5 pairs of intermediate teeth present; ventral caudal lobe short but strong; colour grey or grey-brown above, lighter below, often with darker spots on sides, no light patch on first dorsal fin (Fig. 3) . . . . *Odontaspis ferox*
- 2b. Anal fin lower; teeth usually with a single cusplet on each side; 1 to 3 pairs of intermediate teeth present; ventral caudal lobe hardly developed; colour blackish or brownish black above and below, often with a light patch on the first dorsal fin . . . . . *Odontaspis noronhai*

Fig. 3 *Odontaspis ferox*Fig. 4 *Odontaspis noronhai*

### List of species occurring in the area

The symbol  is given when species accounts are included.

 *Carcharias taurus* Rafinesque, 1810.

 *Odontaspis ferox* (Risso, 1810).

 *Odontaspis noronhai* (Maul, 1955).

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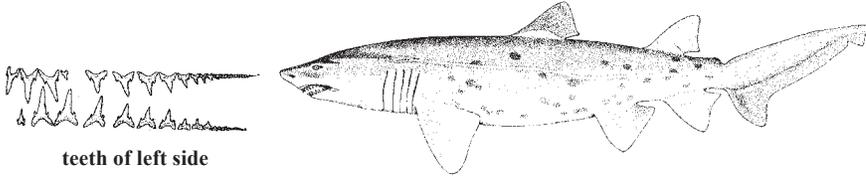
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***Carcharias taurus*** Rafinesque, 1810

CCT

**Frequent synonyms / misidentifications:** *Odontaspis taurus* (Rafinesque, 1810), *Eugomphodus taurus* (Rafinesque, 1810) / None.

**FAO names:** **En** - Sand tiger shark (AFS: Sand tiger); **Fr** - Requin taureau; **Sp** - Toro bacota.

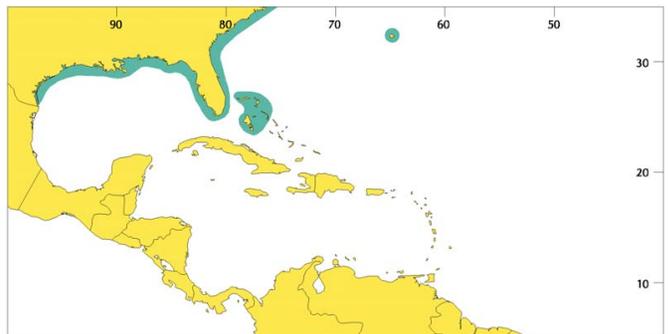


**Diagnostic characters:** A large shark. Head with 5 medium to large gill slits, all in front of pectoral-fin bases, no gill rakers; **snout very short, moderately flattened; eyes small, without nictitating eyelids;** no nasal barbels or nasoral grooves; mouth very long and angular, extending well behind eyes; upper anterior teeth in **3 rows on either side of symphysis**, large, with long, narrow, hooked, sharp-edged but non-serrated cusps and usually 1 short cusplet on each side; upper anterior teeth separated from the smaller lateral teeth by **a single row of tiny intermediate teeth** (lacking in lower jaw); lower anterior teeth separated at front by 2 rows of small symphyseal teeth (generally lacking in upper jaw). Two dorsal fins, the base of first dorsal fin **just in front of pelvic-fin bases and well posterior to pectoral fins; second dorsal fin about as large as first dorsal fin and anal fin;** caudal fin short, strongly asymmetrical, with a pronounced subterminal notch and a short but strong ventral lobe. No keels on caudal peduncle, but with a strong upper precaudal pit and no lower pit. Intestinal valve of ring type. **Colour:** light grey-brown above, white below, often with round or oval, yellow or yellow-brown spots and blotches.

**Size:** Maximum total length to about 318 cm, possibly up to 430 cm; size at birth 95 to 120 cm; males maturing at about 190 to 195 cm, females at 220 cm or more.

**Habitat, biology, and fisheries:** Common littoral shark found inshore from surf zone and in shallow bays to at least 191 m on outer continental shelves. Commonly lives near or on bottom but occurs at midwater and at surface. A slow but strong swimmer that can readily halt and hover motionless in midwater, and is only known shark to gulp and store air in its stomach to maintain neutral buoyancy. It occurs singly, in pairs, or in large schools or aggregations and is migratory in higher latitudes. In northern part of its range it migrates south for the winter. Ovoviviparous (aplacental viviparous), with litters of 2 or occasionally 1 young recorded. Only 1 fetus survives out of several fertilized eggs deposited in each uterus; fetuses resorb their yolk sacs at a small size, with the largest killing smaller rivals and subsisting on additional, nutritive eggs for an 8 to 9 month gestation period. Feeds on a wide variety of bony fishes, small sharks, rays, squids, crabs, and lobsters. Jaws can be protruded to a considerable distance from mouth. Occasionally may bite divers without attempting to feed. A favourite with ecotouristic divers as well as public aquaria. Caught throughout its range along with other shark species, but of little importance recently for commercial fisheries. Caught primarily by line gear in Area 31 and has been utilized for its flesh, liver oil, fins, and hides for leather. Exceptionally vulnerable to overexploitation because of its very low fecundity, and is now protected in the USA.

**Distribution:** In temperate and tropical continental waters; all warm seas except perhaps the eastern Pacific. Most abundant in warm-temperate waters but relatively uncommon and sporadically distributed in the tropics. Mostly absent from oceanic islands, and apparently does not readily cross ocean basins. In the area occurs off the east coast of the USA from Cape Cod to eastern Florida, but rarer and more localized north to New Brunswick, southwest in the Gulf of Mexico to western Florida, Louisiana, and Texas, and east to the northern Bahamas. Also occurs off southern Brazil, Uruguay, and Argentina; the eastern Atlantic from the Mediterranean to South Africa, the western Indian Ocean from South Africa to Mozambique, the Red Sea, and possibly India, and the eastern Indian Ocean and western Pacific from Japan, China, Taiwan Province of China, Viet Nam, Indonesia, and Australia.

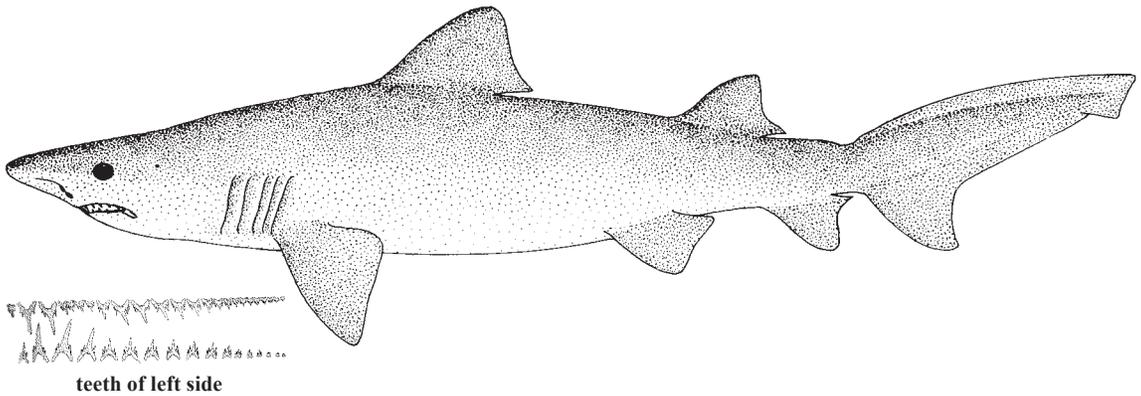


***Odontaspis ferox*** (Risso, 1810)

LOO

**Frequent synonyms / misidentifications:** *Carcharias ferox* (Risso, 1810), *Odontaspis herbsti* Whitley, 1950 / None.

**FAO names:** **En** - Smalltooth sand tiger (AFS: Ragged-tooth shark); **Fr** - Requin féroce; **Sp** - Solrayo.

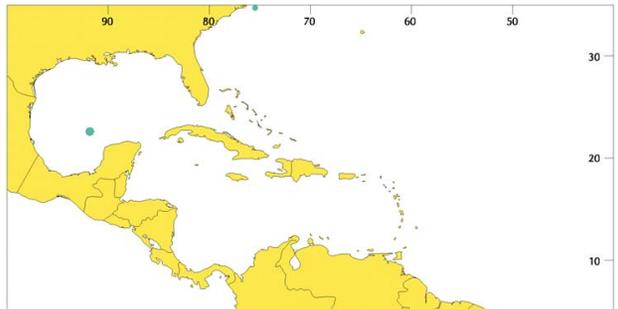


**Diagnostic characters:** A large shark. Head with 5 medium to large gill slits, all in front of pectoral-fin bases; **eyes large, without nictitating eyelids**; no gill rakers; **snout moderately elongated, bulbously conical**; no nasal barbels or nasal grooves; mouth very long and angular, extending well behind eyes; anterior teeth moderate-sized, with long, narrow, straight, sharp-edged, non-serrated cusps and **2 or 3 moderately long cusplets on each side**, separated in front by **2 rows of small symphyseal teeth in both jaws**; **upper anteriors set in 2 rows** on either side of symphysis and **separated from the smaller laterals by 2 to 5 (usually 4) rows of tiny intermediate teeth**; lower anteriors set in 3 rows on either side of symphysis and not followed by small intermediate teeth. Two dorsal fins, the first dorsal fin large and situated closer to the pectoral fins than to the pelvic fins, its free rear tip **well ahead of pelvic-fin origins, the second dorsal fin smaller than the first dorsal fin and larger than anal fin or about equally large**; caudal fin short, strongly asymmetrical, with a pronounced subterminal notch and a short but strong ventral lobe. No keels on caudal peduncle, but a strong upper precaudal pit. Intestinal valve of ring type. **Colour: medium grey or grey-brown on the upper surface, lighter below**, sometimes with darker dusky spots on side, fins dusky in adults but black-edged in young, **first dorsal fin without a light blotch at its apex**.

**Size:** Maximum total length to at least 410 cm and possibly larger; size at birth above 105 cm; males adult at 275 cm, females at 364 cm.

**Habitat, biology, and fisheries:** A rare to uncommon offshore and deep-water species on continental and insular shelves and slopes from 13 to 420 m, and possibly also the epipelagic zone in 140 to 180 m over the ocean floor. Biology sketchily known, presumably ovoviparous (aplacental viviparous), feeds on bony fishes, squid, and shrimp. An incidental and rare bycatch of fisheries in Area 31. Caught in bottom gill nets, on longlines, and in bottom trawls, but possibly too large to be a regular trawl catch. Mostly fished in the Mediterranean Sea and Japan. Recently the subject of ecotouristic diving in the Mediterranean Sea and the eastern Pacific, apparently docile but inquisitive around divers.

**Distribution:** In Area 31 it occurs in the northern Gulf of Mexico off Mexico, and on the Atlantic coast of the USA (North Carolina) but is likely to be more widely distributed; also present in the South Atlantic off Brazil (Natal). Possibly circumglobal in all warm seas but sporadically distributed in the Atlantic, Mediterranean Sea, Indian Ocean, and the western and eastern Pacific Ocean.

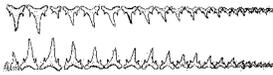
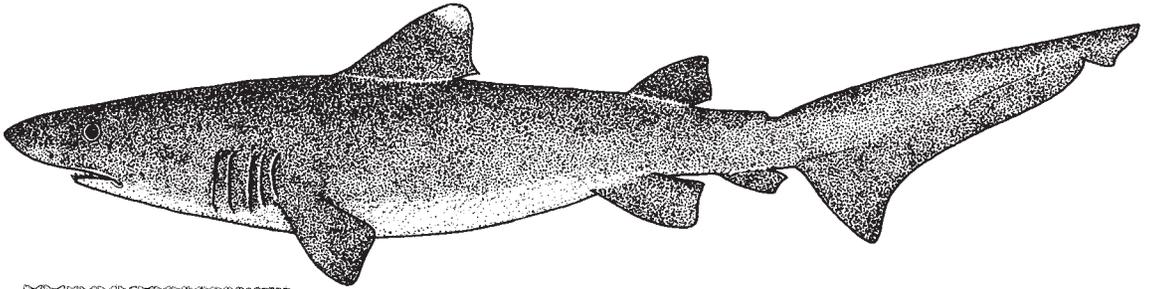


*Odontaspis noronhai* (Maul, 1955)

ODH

**Frequent synonyms / misidentifications:** *Carcharias noronhai* Maul, 1955 / None.

**FAO names:** **En** - Bigeye sand tiger; **Fr** - Requin noronhai; **Sp** - Solrayo ojigrande.



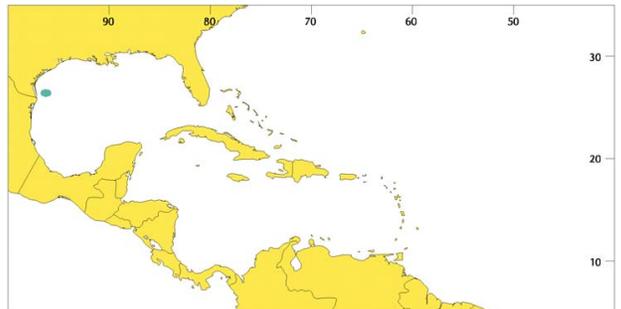
teeth of left side

**Diagnostic characters:** A large shark. Head with 5 medium to large gill slits, all in front of pectoral-fin bases; no gill rakers; **eyes very large, without nictitating eyelids; snout moderately elongated, bulbously conical**; no nasal barbels or nasoral grooves; mouth very long and angular, extending well behind eyes; anterior teeth moderate-sized, with long, narrow, straight, sharp-edged, non-serrated cusps and **a single moderately long cusplet on each side**, separated in front by **2 (sometimes 1 or none) rows of small symphyseal teeth in the upper jaw and 4 to 8 rows in the lower jaw; upper anterior teeth set in 2 rows** on either side of symphysis and separated from the smaller laterals by 1 or 2 rows of tiny intermediate teeth; lower anterior teeth set in 3 rows on either side of symphysis and not followed by small intermediate teeth. Two dorsal fins, the first dorsal fin large and situated **closer to the pectoral fins than to the pelvic fins**, its free rear tip **well ahead of pelvic fin origins, the second dorsal fin smaller than the first and noticeably larger than anal fin**; caudal fin short, strongly asymmetrical, with a pronounced subterminal notch and the **ventral caudal-fin lobe hardly developed**. No keels on caudal peduncle, but a strong upper precaudal pit. Intestinal valve of ring type. **Colour:** glossy black, brownish black, or dark reddish black on entire body and fins, usually a grey or whitish patch on first dorsal fin, no spots on body.

**Size:** Maximum total length to at least 360 cm; size at birth unknown; males maturing above 217 cm and females above 321 cm.

**Habitat, biology, and fisheries:** A rare deep-water and oceanic species that occurs on continental and insular slopes near the bottom at 600 to 1 000 m or more, well off the bottom at 100 m in water 640 m deep, and in the epipelagic and mesopelagic zone in water between 4 500 and 5 300 m. Biology poorly known, presumably ovoviviparous (aplacental viviparous). Feeds on cephalopods and fishes. An incidental and rare bycatch of oceanic and deep benthic fisheries using pelagic and vertical longlines but little utilized; may live mostly below the depths fished by horizontal pelagic longlines and purse seines, and possibly too large to be a regular pelagic or benthic trawl catch.

**Distribution:** Possibly circumglobal in all warm seas but sporadically distributed and with very few records in the Atlantic and central Pacific currently known. In Area 31 it occurs in the northern Gulf of Mexico off Texas. Also occurs in the South Atlantic off Brazil, the central Atlantic near the equator, the eastern Atlantic off Madeira, the Indian Ocean and possibly off the Seychelles, and in the central Pacific near the Hawaiian and Marshall Islands.



## MITSUKURINIDAE

## Goblin sharks

A single species in this family.

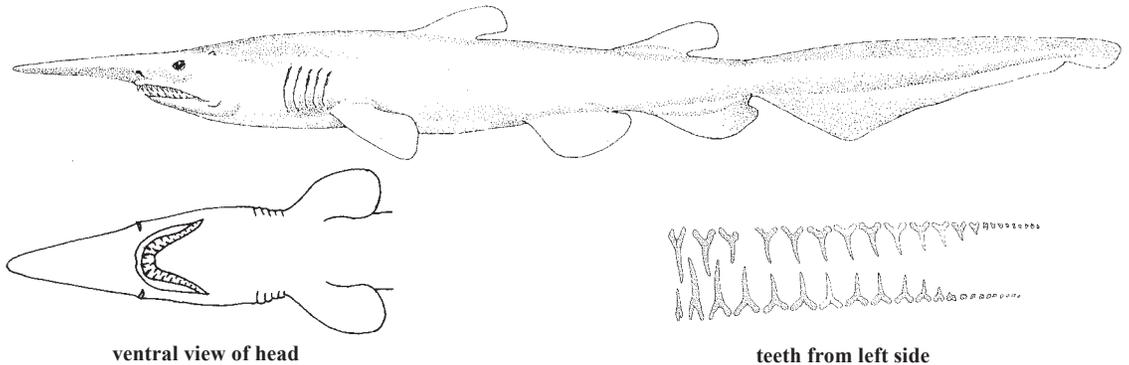
*Mitsukurina owstoni* Jordan, 1898

LMO

**Frequent synonyms / misidentifications:** *Scapanorhynchus owstoni* (Jordan, 1898) / None.

**FAO names:** En - Goblin shark; Fr - Requin lutin; Sp - Tiburón duende.

**Diagnostic characters:** A moderately large, very soft-bodied, flabby shark. Head with 5 medium-sized gill slits, all in front of pectoral-fin bases, their upper ends not extending onto dorsal sides of head; eyes very small on sides of head, without nictitating eyelids; **snout very long and flat, formed as a narrow, pointed blade**; mouth long and angular, extending well behind eyes when jaws are not protruded, but mouth extends in front of eyes when jaws are thrust forward to level of snout tip; lower labial furrows present; **anterior teeth large, with long, extremely narrow, hooked, sharp-edged, but unserrated cusps**, set in 3 rows on either side of symphysis in both jaws; upper anterior teeth separated from the smaller lateral teeth by a gap without small intermediate teeth; cusplets absent on most teeth; no gill rakers; spiracles present but very small; no nasal barbels or oronasal valves. Two low, equal-sized, small dorsal fins, the first dorsal fin closer to the pectoral fins than the pelvic fins; first dorsal-fin base well in front of the pelvic fins and much shorter than caudal fin; **anal fin low, rounded, and much larger than dorsal fins**; caudal fin long but much less than half the total length, strongly asymmetrical, without a well-developed ventral lobe. Caudal peduncle compressed and without keels or precaudal pits. Intestinal valve of ring type, with the turns closely packed like a stack of washers. **Colour:** pinkish white to light grey on body in life, fin webs and gill region dusky; often brown in preservative.

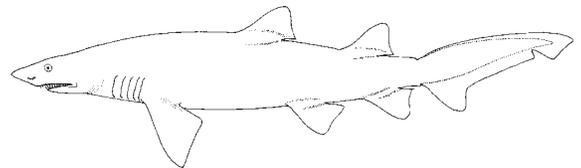


#### Similar families occurring in the area

**Odontaspidae:** Snout conical and short; small intermediate teeth present in upper jaw, teeth mostly with prominent cusplets; first dorsal fin larger, anal fin angular and about as large as the dorsal fins or smaller than them; caudal fin with short but strong ventral lobe; caudal peduncle not compressed and with well-developed upper precaudal pit; colour not pinkish white in life.

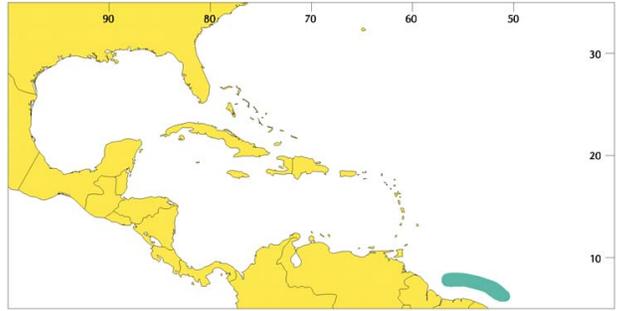
**Size:** Maximum total length 360 cm.

**Habitat, biology, and fisheries:** An uncommon, deep-water, bottom-dwelling, and possibly semiocceanic shark with a spotty but wide distribution on the outer continental shelves and upper slopes down to at least 1 300 m. Most records are between 270 and 960 m deep but rarely taken in shallow water. Biology little known, probably ovoviviparous. Preys on small fishes and possibly squids and crustaceans. Separate statistics are not reported for this species. It is caught as bycatch of other fisheries in fixed bottom nets, with hook-and-line, and possibly in purse seines. Not utilized in the area, discarded or utilized dried-salted for human consumption elsewhere.



Odontaspidae

**Distribution:** Wide-ranging but sporadically distributed in all temperate and tropical seas, in the area off French Guiana and Suriname but probably more wide-ranging; also in the eastern Atlantic, southeastern Indian Ocean, western Pacific, and eastern North Pacific.



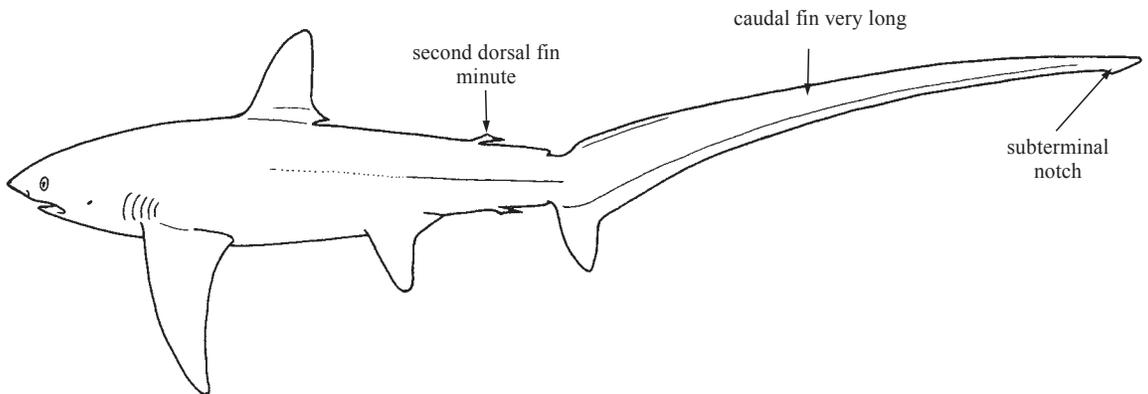
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## ALOPIIDAE

## Thresher sharks

**Diagnostic characters:** Large sharks. Trunk and precaudal tail cylindrical, not depressed and without lateral ridges; **precaudal tail much shorter than trunk**. Head not expanded laterally, not depressed. Eyes on sides of head, without nictitating lower eyelids. Snout moderately long, bluntly conical, not flattened, and without lateral teeth or barbels; nostrils without barbels, nasal grooves, or circumnarial grooves, well separated from mouth. Mouth small but arched and elongated, extending well behind eyes; labial furrows present on lower jaw only or absent, when present not reaching front of mouth. Teeth small, blade-like, and compressed, with erect to oblique cusps and cusplets very small or absent; anterior teeth in upper jaw slightly larger than lateral teeth and sometimes separated from them by a row of smaller intermediate teeth on each side. Five small to medium-sized **gill slits** present, **the last 2 behind pectoral-fin origins**, their upper ends not expanded onto upper surface of head; no gill rakers or sieves on internal gill slits; spiracles present and minute. Two dorsal fins, without spines, the first moderately large, high and angular, much shorter than the caudal fin, and with its base located over the interspace between pelvic- and pectoral-fin bases; second dorsal fin low, minute, and less than 1/10 the size of the first dorsal fin; anal fin present, very small, with its origin under or behind the second dorsal-fin insertion; caudal fin strongly asymmetrical, **the upper lobe enormously enlarged, about half the total length and with a subterminal notch**, and an undulated or rippled dorsal margin, the lower lobe short but strong; vertebral axis of caudal fin raised above body axis. Caudal peduncle not depressed, without keels; precaudal pits present. Intestinal valve of ring type. **Colour:** bluish, blackish, grey, or brown above, shading to white or grey below.



**Habitat, biology, and fisheries:** These are active, strong-swimming, pelagic, coastal and deep-water sharks, with the young of 1 species occurring close inshore and inside bays. They feed mainly on small to moderately large schooling fishes and squids, which may be herded and stunned by the long, strap-like tail. Threshers are circumtemperate and tropical in all warm oceans. This monogeneric family comprises only 3 or 4 species worldwide, 2 of which occur in the area. These occur along the Atlantic coast of the USA, on the north coast of Cuba, and in the Gulf of Mexico. In Area 31 considerable numbers of bigeye threshers have been taken in longline fisheries off the north coast of Cuba and off the USA. Thresher sharks form an important component of the world oceanic shark fishery, particularly because of their high-quality meat which is utilized fresh, frozen, smoked, and dried-salted. Their fins are used for shark-fin soup, livers for vitamin extraction, and hides for leather. Primarily captured by offshore longline fisheries but also offshore and near shore with line gear (including rod-and-reel) and fixed bottom gill nets.

**Remarks:** The pelagic thresher, *Alopias pelagicus* Nakamura, 1935, is a poorly known oceanic species presently known from Southeast Africa, Madagascar, northwestern Indian Ocean, Taiwan Province of China, the central Pacific, and the tropical eastern Pacific. It has not been taken in the Atlantic but should be watched for, as it has been mistaken for *Alopias vulpinus* elsewhere. It differs in having the eyes placed more ventrally, the forehead less convex, the snout more elongated, the head narrower, no labial furrows, teeth more oblique, pectoral fin less falcate and broad-tipped, and white colour from belly not expanding over pectoral-fin base.

### Similar families occurring in the area

No other sharks in the area have the caudal fin about half the total length.

### Key to the species of Alopiidae occurring in the area

- 1a. Head nearly flat between eyes; a deep horizontal groove on nape of each side above gills; eyes very large, with orbits expanded onto dorsal surface of head; labial furrows rudimentary; teeth larger, less than 25 rows in each jaw; first dorsal-fin base closer to pelvic-fin bases than pectoral-fin bases (Fig. 1); pectoral fins broad-tipped; sides above pectoral bases dark, without an extension of the white abdominal area . . . . . *Alopias superciliosus*
- 1b. Head strongly arched between eyes; no horizontal groove or an inconspicuous one on nape of each side; eyes smaller, with orbits not expanded onto dorsal surface of head; lower labial furrows well developed; teeth smaller, usually more than 29 rows in each jaw; first dorsal-fin base about equidistant between pectoral- and pelvic-fin bases or closer to pectoral-fin bases (Fig 2); pectoral fins falcate and narrow-tipped; sides above pectoral bases marked with a white patch extending forward from the abdominal area . . . . *Alopias vulpinus*

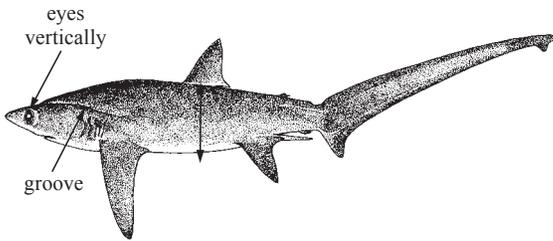


Fig. 1 *Alopias superciliosus*

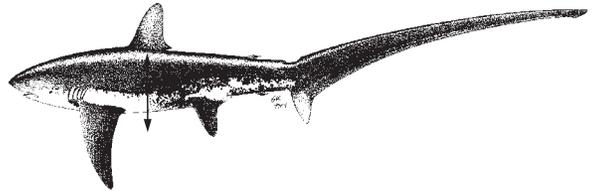


Fig. 2 *Alopias vulpinus*

### List of species occurring in the area

The symbol  is given when species accounts are included.

 *Alopias superciliosus* (Lowe, 1839).

 *Alopias vulpinus* (Bonnaterre, 1788).

### References

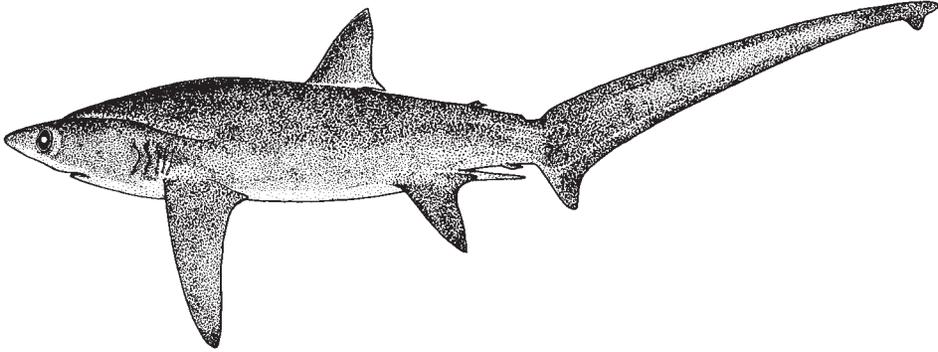
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*Alopias superciliosus* (Lowe, 1839)

BTH

**Frequent synonyms / misidentifications:** *Alopias profundus* Nakamura, 1935 / *Alopias pelagicus* (Nakamura, 1935); *Alopias vulpinus* (Bonnaterre, 1788).

**FAO names:** En - Bigeye thresher; Fr - Renard à gros yeux; Sp - Zorro ojón.

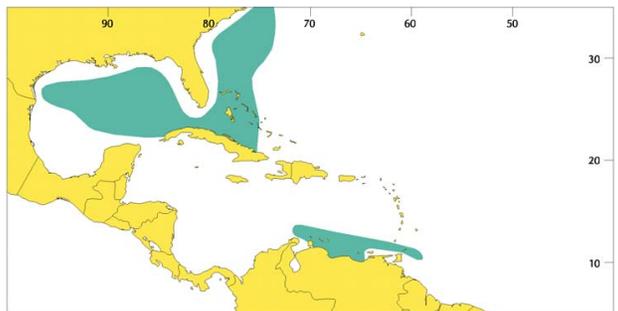


**Diagnostic characters:** A large shark. Head with 5 medium-sized gill slits, the last 2 above pectoral-fin bases; a deep horizontal groove on nape on each side from the level of mouth to pectoral fins; profile of forehead distinctly indented over eyes; interorbital space nearly flat. Eyes very large, expanding onto dorsal surface of head, permitting upward vision; no nictitating eyelids. Snout moderately long and conical; no nasal barbels or nasoral grooves on nostrils. Mouth moderately long and semicircular, placed below the eyes, with rudimentary labial furrows. Teeth moderately large, less than 25 rows in upper or lower jaws, sharp-edged, with a single, broad, straight or posteriorly curved cusp and no cusplets; anterior teeth not greatly enlarged, uppers not separated from the large laterals by smaller intermediate teeth. Two dorsal fins, the first moderately large and located just in front of pelvic-fin origins, closer to pelvic fins than to pectoral fins; second dorsal fin minute and positioned well ahead of the small anal fin; pectoral fins very narrow, long and falcate, broad-tipped; upper lobe of caudal fin very long and strap-like, almost or quite equal to the length of rest of shark; lower lobe short but well developed. Upper precaudal pit present but caudal keels absent. Intestinal valve of ring type. Colour: purplish grey above, cream below, posterior edges of pectoral fins, pelvic fins, and sometimes first dorsal fin dusky; light colour of abdomen not expanded over pectoral-fin bases.

**Size:** Maximum total length to about 4.6 m, said to reach 5.5 m but possibly erroneous; commonly between 3 and 4 m. Size at birth between 100 and 140 cm; size at maturity between 2.8 and 3.5 m.

**Habitat, biology, and fisheries:** Found in coastal waters over the continental shelves, sometimes close inshore in shallow waters, and on the high seas far from land, in deep water down to at least 500 m. Apparently strong-swimming. Ovoviviparous, with uterine cannibalism, number of young usually 2 per litter, but sometimes up to 4. Feeds on pelagic fishes (lancetfishes, clupeoids, scombroids, and small billfishes) and bottom fishes (hakes); also squids. Apparently stuns its prey with its long caudal fin, as individuals are often tail-hooked on longlines. Apparently harmless to people. Generally caught in oceanic longline fisheries operated by Cuba, the USA, and probably also Japan, Korea, and Taiwan Province of China; especially important areas for these fisheries were the Atlantic coast of the USA and Cuba. The species is also taken in fixed bottom and pelagic gill nets, in trawls, and with sportsfishing gear (rod-and-reel). Its meat is utilized fresh, smoked, and dried-salted for human consumption, its liver oil is processed for vitamins, its skin for leather, and fins for shark-fin soup. Separate statistics are not reported for this species, but it ranked fourth in weight of catch (average for 1971 through 1973) in the oceanic shark fishery off Cuba.

**Distribution:** Virtually circumglobal in tropical and warm temperate seas. In the area from Nassau and the northern coast of Cuba northward to off New Jersey and Long Island, and the Gulf of Mexico south to Venezuela. Also off southern Brazil and the eastern Atlantic, Mediterranean, and Indo-Pacific. In the Western Central Atlantic, concentrations have occurred off Cape Hatteras and the north coast of Cuba.

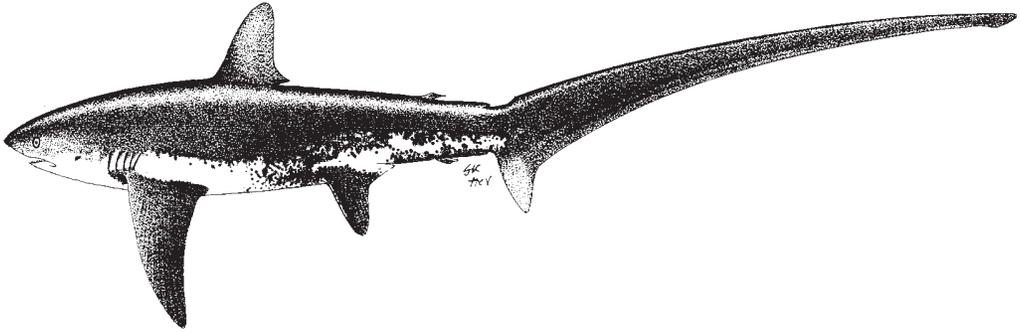


*Alopias vulpinus* (Bonnaterre, 1788)

ALV

**Frequent synonyms / misidentifications:** None / *Alopias pelagicus* (Nakamura, 1935); *Alopias superciliosus* (Lowe, 1840).

**FAO names:** En - Thresher shark; Fr - Renard; Sp - Zorro.

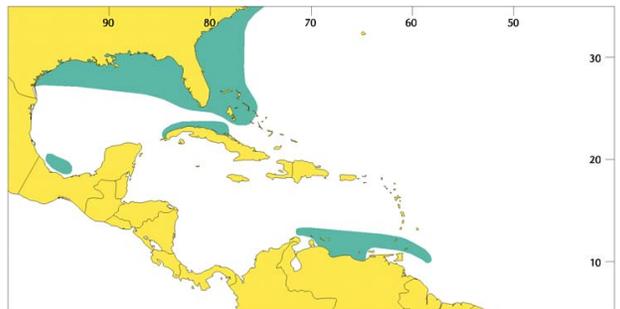


**Diagnostic characters:** A large shark. Head with 5 medium-sized gill slits, the last 2 above pectoral-fin bases; **no grooves on nape**; forehead broadly convex in lateral view, not indented at nape. **Eyes moderately large, not expanded onto the dorsal surface of head**; no nictitating eyelids. **Snout short and conical**; no nasal barbels or nasoral grooves on nostrils. Mouth short and semicircular, below eyes, with short lower labial furrows. Teeth small, **usually over 29 rows in upper and lower jaws**, sharp-edged, with a single, broad, straight or posteriorly curved cusp and usually no cusplets; anterior teeth not greatly enlarged, **uppers usually separated from the laterals by a small intermediate tooth**. No gill rakers. Two dorsal fins, the first moderately large, **with its base well ahead of the pelvic-fin bases and farther from them than from the pectoral-fin bases**; second dorsal fin minute and positioned just in front of the small anal fin; upper lobe of caudal fin very long and strap-like, about as long as, or longer than, rest of shark; lower lobe short but well developed; **pectoral fins very long and falcate, with narrowly rounded (small juveniles) to acutely pointed, narrow tips**. Upper precaudal pit present but caudal keels absent. Intestinal valve of ring type. **Colour:** brown, grey, blue-grey, or blackish on back and underside of snout, lighter on sides, and abruptly white below; **a white area extends from the abdomen over the pectoral-fin bases**; pectoral, pelvic, and dorsal fins blackish, white dots sometimes present on pectoral-, pelvic-, and caudal-fin tips.

**Size:** Maximum total length between 5 and 6.1 m; commonly between 4.3 and 4.9 m. Size at birth between about 114 and 160 cm; size at maturity between 288 and 400 cm.

**Habitat, biology, and fisheries:** Coastal over the continental and insular shelves and epipelagic far from land in cold-temperate to tropical waters; young often close inshore and in shallow bays, from the surface to 370 m. An active, strong-swimming shark, sometimes leaping out of the water. Ovoviviparous and apparently a uterine cannibal, number of young 2 to 4 per litter (usually 2). Feeds mostly on small schooling fishes, including mackerels, bluefishes, clupeids, needlefishes, lancetfishes, and lanternfishes; also squids, octopuses, and pelagic crustaceans, and rarely seabirds. Herds and stuns its prey with its long, whiplike caudal fin, and is often caught on longlines by being tail-hooked. Uncommon, although concentrations are sometimes present among the Florida Keys; apparently rare off Cuba; a spring to autumn visitor in the northern part of its range in the western Atlantic, but absent in winter. Caught in oceanic longline fisheries; important in the northwestern Indian Ocean and the central Pacific. Also fished with anchored bottom and surface gill nets, floating gill nets, and sportfishing gear (rod-and-reel). The meat is highly prized fresh but also eaten smoked and dried-salted; fins are valuable for shark-fin soup; hide is usable for leather and liver oil can be processed for vitamins. Apparently harmless to people; a few attacks on boats are attributed to this species.

**Distribution:** Virtually circumglobal in temperate to tropical waters. In the western Atlantic from Newfoundland south to Florida, Cuba, and the Gulf of Mexico; also off Brazil and Argentina. Wide-ranging in the eastern Atlantic, Mediterranean, and Indo-Pacific. Some western Pacific and Indian Ocean records of this species may be based on *A. pelagicus*.



**CETORHINIDAE****Basking sharks**

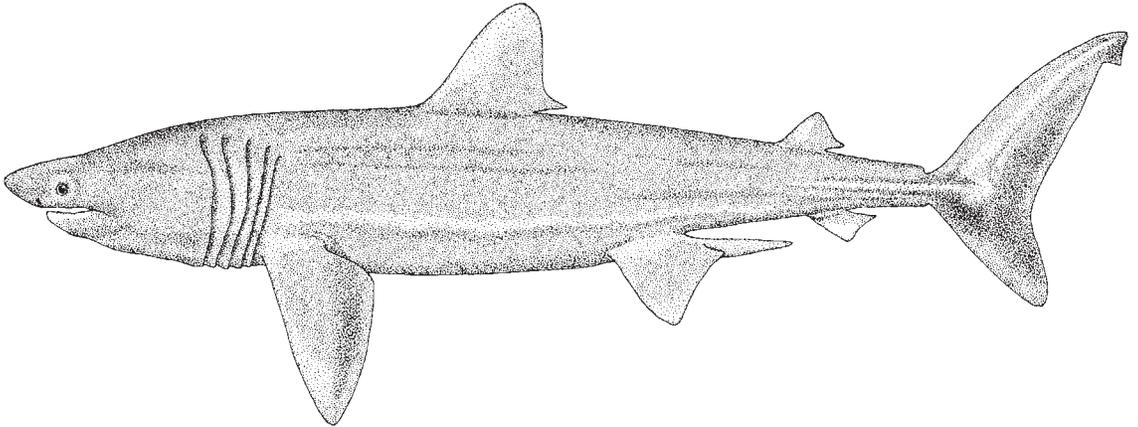
A single species occurring in the area.

*Cetorhinus maximus* (Gunnerus, 1765)

BSK

**Frequent synonyms / misidentifications:** None / None.

**FAO names:** En - Basking shark; Fr - P lerin; Sp - Peregrino.



**Diagnostic characters:** A very large shark. Head with **5 extremely long gill slits, almost meeting at the midline above and below**, the last in front of pectoral fins. No nictitating lower eyelid. Snout long, conical or hooked (in young); nostrils without barbels or nasoral grooves. Teeth very small, extremely numerous, not blade-like, and with a single cusp. **Unique, long, bristle-like gill rakers formed from modified dermal denticles, in rows along the internal gill openings** and serving as plankton strainers (occasionally absent in individuals in which they have been shed and new rakers have not yet developed). Two dorsal fins, the first on the back above the space between pectoral and pelvic fins, the second less than 1/3 the size of first; anal fin present; **caudal fin much less than half total length, nearly symmetrical and crescentic, with a strong lower lobe. Caudal peduncle strongly depressed, with strong keels on sides**; precaudal pits present. Intestinal valve of ring type. **Colour:** blackish, slate grey, blue-grey, or greyish brown above, similar below or slightly lighter, often with white patches and bands on snout and belly.

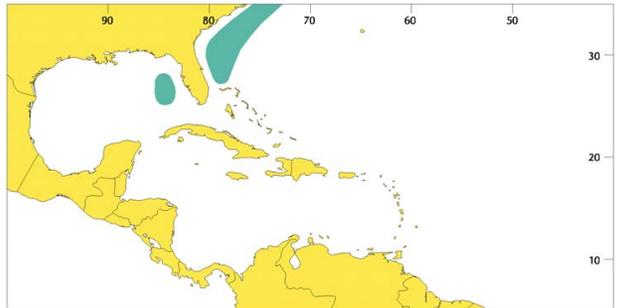
**Similar families occurring in the area**

No other sharks in the area have the combination of gigantic gill slits, gill rakers, small numerous hooked teeth, strong caudal keels, and nearly symmetrical caudal fin.

**Size:** Maximum total length at least 9.8 m.

**Habitat, biology, and fisheries:** A temperate-boreal, harmless species that usually is seen at or near the surface, singly or in groups up to 100 or more. A plankton-feeding, slow but strong swimming migratory shark occurring well offshore and close inshore, sometimes in large bays and right off beaches. Caught only incidentally in Area 31, but this species has been subject to small and irregular fisheries in the North Atlantic north of Area 31 and the North Pacific.

**Distribution:** The basking shark barely enters Fishing Area 31, with a few records from Florida (east and west coasts) and Georgia, possibly of waifs from more northern waters. Found in the North Atlantic and Mediterranean, the South Atlantic coasts of South America and South Africa, the eastern Pacific, and the western Pacific.



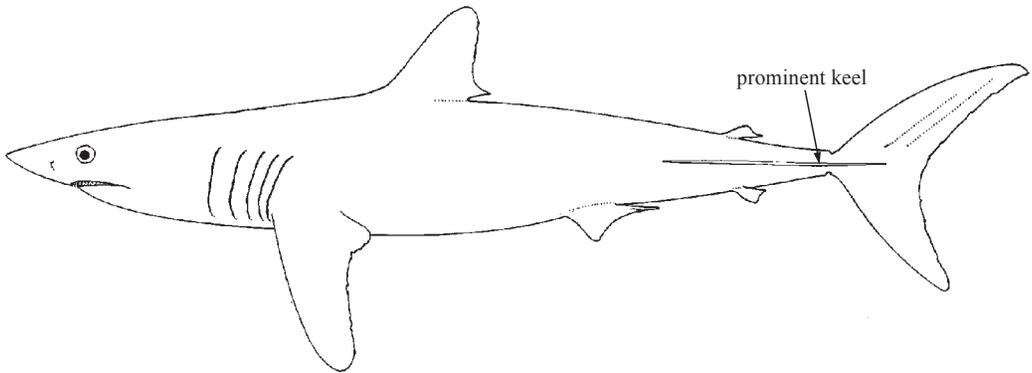
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## LAMNIDAE

## Mackerel sharks, makos, white sharks, porbeagles

**Diagnostic characters:** Large-sized sharks with fusiform body. Head with 5 gill slits, **all in front of pectoral-fin origins**; no nictitating eyelids; **teeth long and few in number**, awl- or blade-like, with a single cusp; gill arches without rakers. **Two dorsal fins, the first dorsal fin much shorter at base than caudal fin and far in advance of pelvic fins; second dorsal fin and anal fin much smaller than first dorsal fin, with narrow, pivoting bases; caudal fin lunate**, less than 1/3 of total length. **Caudal peduncle strongly depressed dorsoventrally and expanded laterally, with a prominent keel on each side, extending well out on caudal fin**. Intestinal valve of ring type. **Colour:** back pale grey, greyish blue, purplish blue, brownish, blackish grey or black; underside white to lighter grey.

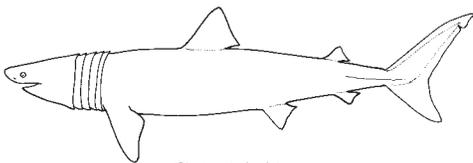


**Habitat, biology, and fisheries:** Inhabits temperate and tropical waters (oceanic as well as coastal) throughout the world. Very fast swimmers and voracious predators, feeding mainly on bony fishes and cephalopods, but also on other sharks, batoids, chimaeras, marine mammals, sea birds, turtles, crustaceans, and carrion; some species, particularly the white shark, infrequently bite and rarely feed on people, but are also of growing interest for ecotouristic diving and film-making. Most species are important for commercial fisheries and for sports angling. Mackerel sharks are often used for food or for production of liver oil, fish meal, fins, jaws, teeth, and other shark products.

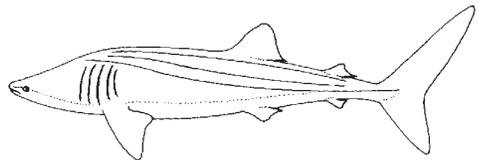
## Similar families occurring in the area

**Cetorhinidae:** much longer gill openings, extending from upper surface of head to throat; gill rakers well developed on internal gill openings; teeth minute and hooked, not blade-like; anal and second dorsal fin larger; and size of adults larger, 7 to 10 m or more.

**Rhincodontidae:** body with several prominent dermal ridges on either side; last gill slit well behind pectoral-fin origin; snout squared off anteriorly; mouth nearly terminal; at least half of first dorsal-fin base posterior to pelvic-fin origins; gill arches connected by masses of spongy tissue; a spotted and striped colour pattern; and size of adults larger, 7 to 18 m or more.



Cetorhinidae



Rhincodontidae

All other shark families: caudal fin strongly asymmetrical and not lunate, the upper lobe extending far beyond lower lobe; caudal peduncle not greatly flattened dorsoventrally. Also, fifth gill opening somewhat behind pectoral-fin origin in Alopiidae, Triakidae, Carcharhinidae, Scyliorhinidae and Ginglymostomatidae (in front of pectoral-fin origin in Lamnidae).

**Key to the species of Lamnidae occurring in the area**

- 1a. Teeth with small side cusplets (except in specimens less than 1 m) (Fig. 1a); origin of second dorsal fin above that of anal fin; caudal fin with a small but strong secondary keel below the rear end of the primary keel (Fig 2); free rear tip of first dorsal fin abruptly white. . . . *Lamna nasus*
- 1b. Teeth without side cusplets (except in *Carcharodon* less than 2 to 3 m which always have serrations on some teeth); origin of second dorsal fin in advance of anal-fin origin; caudal fin without a secondary keel (Fig. 3, 4); free rear tip of first dorsal fin not abruptly white . . . . . → 2

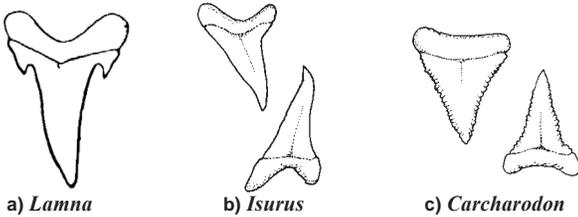


Fig. 1 teeth

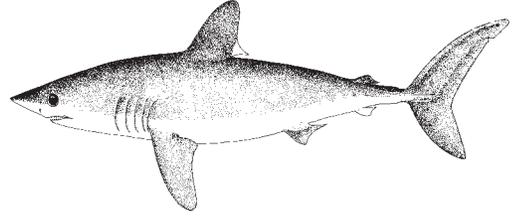


Fig. 2 *Lamna nasus*

- 2a. Upper teeth triangular with serrated edges (Fig. 1b); origin of first dorsal fin opposite or slightly anterior to inner corners of pectoral fins when the latter are laid back; anal-fin origin posterior to second dorsal-fin base (Fig. 3) . . . . . *Carcharodon carcharias*
- 2b. Upper teeth with smooth-edged cusps; origin of first dorsal fin posterior to inner corners of pectoral fins when the latter are laid back; anal-fin origin below midbase or insertion of second dorsal-fin base (Fig. 4, 5, 6) . . . . . → 3

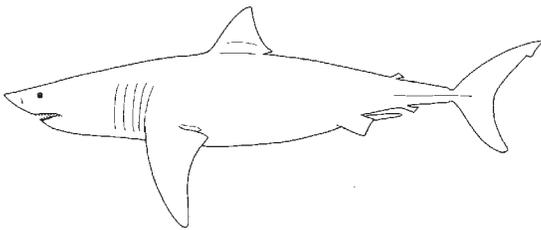


Fig. 3 *Carcharodon carcharias*

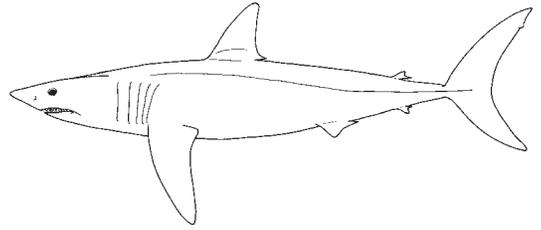


Fig. 4 *Isurus oxyrinchus*

- 3a. Snout usually acutely pointed (Fig. 5a); cusps of upper and lower anterior teeth recurved at bases but with tips reversed and curving outward; pectoral fins considerably shorter than head, relatively narrow-tipped in young, acutely pointed in adults; origin of anal fin about under midbase of second dorsal fin; underside of snout and mouth white in adults and subadults in the area (Fig. 4) . . . . . *Isurus oxyrinchus*
- 3b. Snout narrowly to bluntly (usually not acutely) pointed (Fig. 5b); cusps of upper and lower anterior teeth straighter, with tips not reversed; pectoral fins about as long as head, relatively broad-tipped in young and adults; origin of anal fin about under insertion of second dorsal fin; underside of snout and mouth dusky in adults and subadults (Fig. 6) . . . . *Isurus paucus*

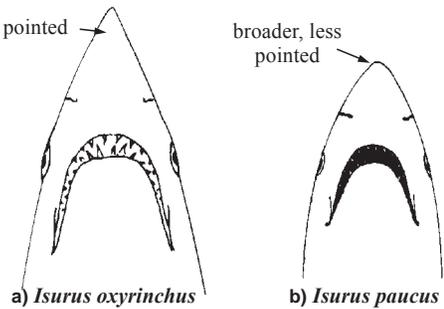


Fig. 5 ventral view of head

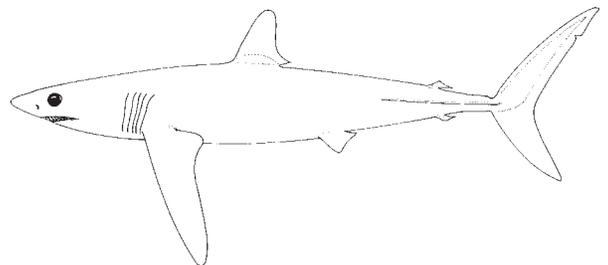


Fig. 6 *Isurus paucus*

**List of species occurring in the area**

The symbol  is given when species accounts are included.

 *Carcharodon carcharias* (Linnaeus, 1758).

 *Isurus oxyrinchus* Rafinesque, 1810.

 *Isurus paucus* Guitart Manday, 1965.

 *Lamna nasus* (Bonnaterre, 1788).

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*Carcharodon carcharias* (Linnaeus, 1758)

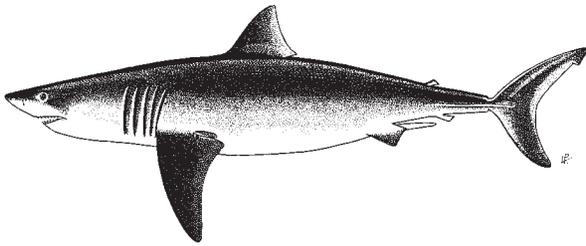
WSH

**Frequent synonyms / misidentifications:** None / None.

**FAO names:** **En** - Great white shark (AFS: White shark); **Fr** - Grand requin blanc; **Sp** - Jaquenton flameo.



ventral view of head



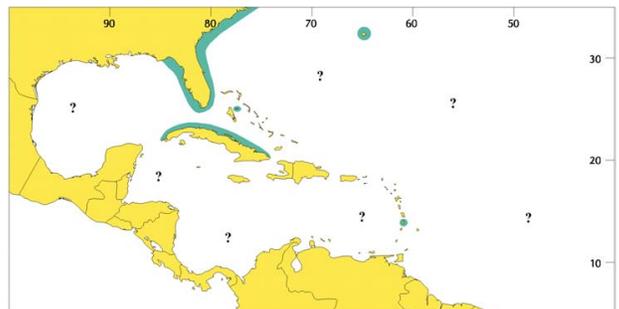
teeth on left side

**Diagnostic characters:** A very large shark with a fusiform, usually heavy body and a moderately long, **bluntly pointed snout**. Head with 5 **very long gill slits**, all in front of pectoral-fin origins; gill arches without rakers; spiracles very small; mouth long and broadly rounded. **Teeth very large** and relatively few, narrower in the lower than in the upper jaw, pointed backwards, with a **single broad cusp and with strong serrations** at most sizes (serrations irregular in newborn individuals below 1.5 m length); cusplets present on teeth of sharks up to about 2 to 3 m length, but lost in larger individuals; anterior teeth greatly enlarged in both jaws, in 2 rows on either side of symphysis, **broadly triangular and compressed (especially in the upper jaw), not recurved; single intermediate tooth and first few lateral teeth a little smaller than anterior teeth, the intermediate tooth larger and less differentiated from the anterior and lateral teeth than in other members of the family, cusp of intermediate tooth directed ventromedially**. **Two dorsal fins, the first dorsal fin large, originating over inner margins of pectoral fins, the second dorsal fin very small; pectoral fins shorter than head and falcate; anal-fin origin posterior to rear end of second dorsal-fin base; caudal fin lunate, its lower lobe strongly developed**. Caudal peduncle very much flattened dorsoventrally, expanded laterally, **with a prominent keel on either side extending well out on caudal fin** but with no secondary keel on the fin. **Colour:** grey-brown, dark grey, blue-grey, blackish, light grey or grey-white above, white below, fins with dusky margins below, usually with black tips on underside of pectoral fins and a conspicuous black spot present at pectoral-fin axils.

**Size:** Maximum total length to almost 6 m and possibly 6.4 m; adults commonly to between 5 and 6 m; size at birth between 100 and 165 cm; males maturing between 350 and 410 cm, females between 400 and 500 cm.

**Habitat, biology, and fisheries:** Littoral and epipelagic, often occurring close inshore and entering shallow bays and salty estuaries but also found in the open ocean and off oceanic islands. Recorded from the surface and intertidal down to 1 280 m on the continental slopes. Ovoviviparous (aplacental viviparous), litter size 2 to possibly 14. A strong swimmer, often jumping entirely out of the water. A powerful predator, feeding on a wide variety of marine animals, including other sharks, rays, chimaeras, bony fishes, seals and sea lions, dolphins and porpoises, sea birds, turtles, crabs, and squid, as well as carrion. A bold, inquisitive, social shark. Uncommonly but regularly biting swimmers, divers, surfers, and boats, but rarely eating people. Of limited interest to commercial fisheries, mostly taken as bycatch with longlines, hook-and-line, fixed bottom gill nets, fish traps, herring weirs, purse seines, trammel nets, harpoons, and even bottom and pelagic trawls. Prized by sports anglers but also by ecotouristic shark divers. Much photographed by documentary film-makers. Vulnerable to overfishing because of its low abundance, slow growth, notoriety, and ease of capture, and is protected in several countries at present. Utilized fresh, dried-salted, and smoked; the liver oil is extracted for vitamins; the carcass is used for fish meal; the skin used for leather; the fins are highly valued for shark-fin soup; and the teeth and jaws for decorations.

**Distribution:** Cosmopolitan in cold-temperate to tropical seas, but most commonly recorded in cool to warm-temperate waters. In the western Atlantic, from Newfoundland and Nova Scotia to Florida, the Bahamas, Cuba, and the northern Gulf of Mexico; also Brazil and Argentina. Probably more wide-ranging in Area 31 and may occur anywhere within it, but apparently rare and sporadic in the tropics.

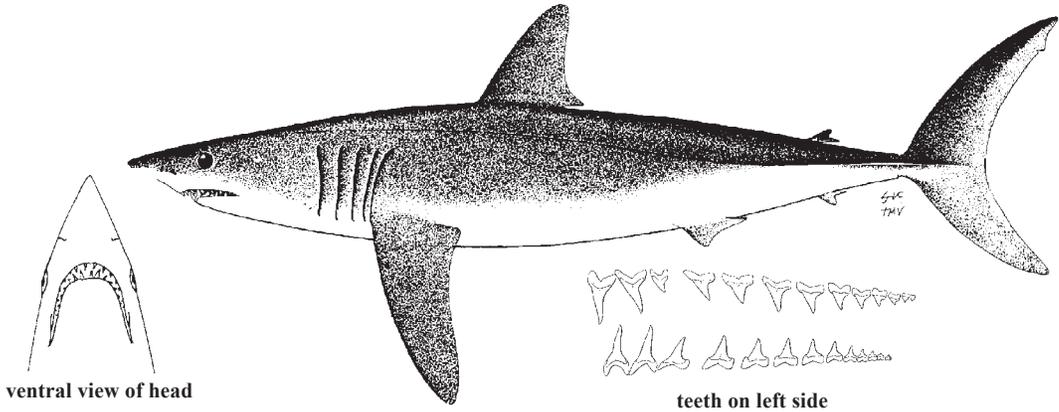


***Isurus oxyrinchus*** Rafinesque, 1810

SMA

**Frequent synonyms / misidentifications:** *Oxyrhina glauca* Müller and Henle, 1839 / *Isurus paucus* (Guitart Manday, 1966).

**FAO names:** En - Shortfin mako; Fr - Taupe bleu; Sp - Alecrín.

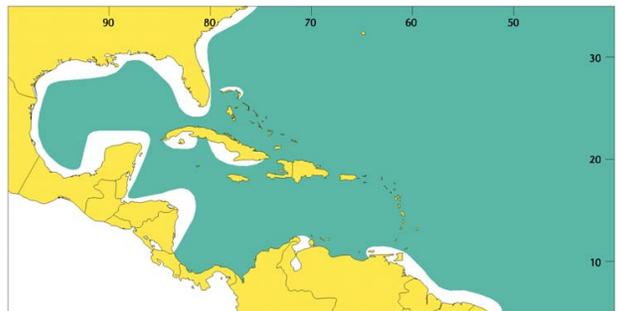


**Diagnostic characters:** A large shark with fusiform and moderately slender body and long and **acutely pointed snout**. Head with 5 long gill slits, all in front of pectoral-fin origins; gill arches without rakers; spiracles very small. Mouth broadly rounded and notably long. **Teeth large and relatively few**, alike in both jaws, backward-pointing, **somewhat flexuous in outline, smooth-edged, with a single cusp**; the first 2 anterior teeth in each jaw the largest, recurved at base but with the curve reversed at tips; a small intermediate tooth between the upper anterior and lateral teeth, this with a ventrolaterally directed cusp. Two unequal-sized dorsal fins, the first dorsal fin large and with its origin posterior to inner corners of pectoral fins when latter are laid back, its apex bluntly rounded (young) to acutely pointed (adults); pectoral fins moderately long (shorter than head) and falcate; anal-fin origin below about middle of second dorsal-fin base; caudal fin lunate, its lower lobe strongly developed. Caudal peduncle very flattened dorsoventrally, but expanded laterally, with a prominent keel on each side extending well out on caudal fin. **Colour:** back grey-blue to purplish or deep blue; belly white.

**Size:** Maximum total length to about 4 m; commonly to 2.7 m; size at birth about 60 to 70 cm; males maturing between 203 and 215 cm, females between 275 and 293 cm.

**Habitat, biology, and fisheries:** Oceanic and coastal, usually in surface waters, approaching close inshore, but also in deeper water to at least 500 m. Perhaps the most active and strong-swimming of sharks, renowned for leaping out of the water, especially when hooked. Ovoviviparous, number of young in a litter 4 to 30. Feeds heavily on schooling fishes (mackerels, jacks, herrings, etc.), also eats small sharks, larger bony fishes such as tunas and swordfishes, and rarely dolphins. A bold shark, occasionally biting swimmers and boats; hooked individuals fight very hard and may leap into the boats of anglers attempting to subdue them. An important species for longline fisheries, because of its high-quality meat. Highly prized by sport anglers. Viewed by ecotouristic divers off California and in the western Indian Ocean. Caught commercially mostly with pelagic longlines, also gill nets and hook-and-line. The meat is utilized fresh, frozen, smoked, and dried-salted; the oil is extracted for vitamins; the fins used for shark-fin soup; the hides processed into leather and the jaws and teeth used for ornaments. This species was an important fisheries species off Cuba in the 1970s and averaged second in weight of sharks caught in 1971 to 1973. Conservation status is of concern because of declines in Area 31 and elsewhere due to overfishing, and catches are regulated and limited in the USA.

**Distribution:** Cosmopolitan in warm-temperate and tropical seas. western Atlantic from the Gulf of Maine to Brazil and Argentina; occurs throughout Area 31, more common in the Caribbean Sea, rare around Bermuda.

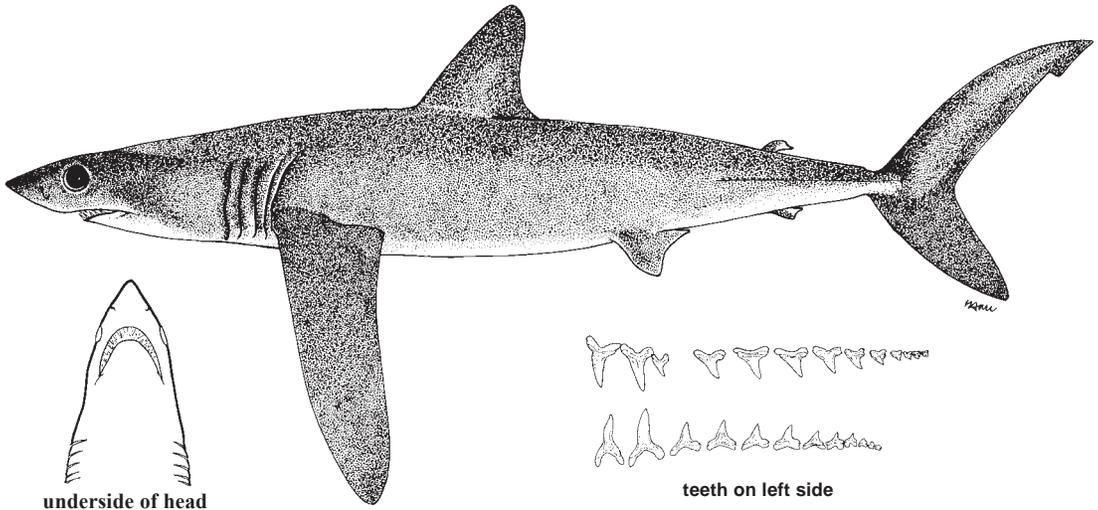


*Isurus paucus* Guitart Manday, 1965

LMA

**Frequent synonyms / misidentifications:** *Isurus alatus* Garrick, 1967 / *Isurus oxyrinchus* (Rufinesque, 1810).

**FAO names:** En - Longfin mako; Fr - Petit taupe; Sp - Marrajo carite.

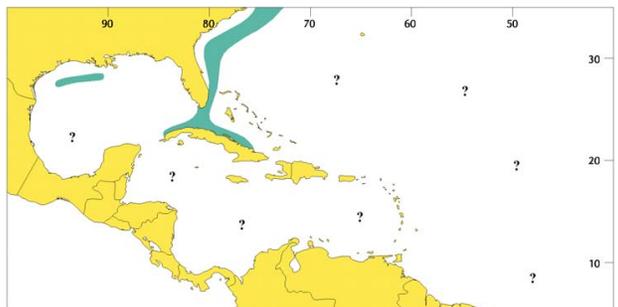


**Diagnostic characters:** A large shark with a fusiform and moderately slender body and a long, pointed snout. Head with 5 long gill slits, all in front of pectoral-fin origins; gill arches without rakers; spiracles very small. Mouth long and broadly rounded. Teeth large and relatively few, alike in both jaws, pointed backward, not greatly flexed, with a single cusp, but **without cusplets or serrations; anterior teeth greatly enlarged in both jaws**, in 2 rows on each side, **cusps recurved at bases but not reversed at tips; a small intermediate tooth between the upper anterior and lateral teeth, this with a ventrolaterally directed cusp**. Two unequal-sized dorsal fins, the first large, originating posterior to free rear tips of pectoral fins, with a bluntly rounded apex, the second dorsal fin very small; anal fin very small, originating about under rear end of second dorsal-fin base; pectoral fins about as long or longer than head, straight to falcate, and broad-tipped; caudal fin lunate, with a very long lower lobe. Caudal peduncle strongly flattened dorsoventrally and expanded laterally, with a prominent keel on each side extending well onto caudal fin. **Colour:** back and sides darker slaty blue or grey-black, undersides white in young but partly to entirely dusky in adults and subadults.

**Size:** Maximum total length at least 4.17 m, common at 2.8 and 3.0 m; size at birth between 97 and 120 cm; adults 245 cm or larger.

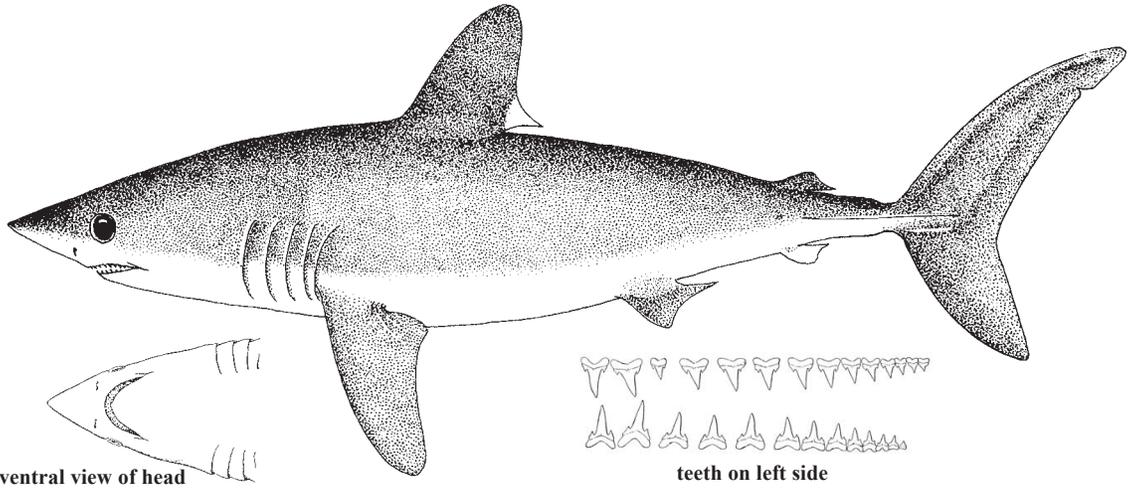
**Habitat, biology, and fisheries:** A little-known oceanic shark, possibly approaching land to give birth. Ovoviviparous (aplacental viviparous), number of young 2 to 8 per litter. Probably feeds on oceanic schooling fishes and other pelagic animals as does *I. oxyrinchus*, but its large broad fins and slender body suggest that it is a slower, less active shark than that species. It is not known to have bitten people or boats. Separate statistics are mostly not reported for this species, except by the USA (over the last decade). Taken with longlines, hook-and-line, and anchored gill nets. In 1971 to 1972 this shark averaged sixth in weight of sharks caught off the north coast of Cuba. It is utilized fresh, frozen and dried-salted. Conservation status uncertain, but of concern because of its scarcity in most areas and exposure to fisheries that may have caused declines in catches of the far more abundant *I. oxyrinchus*.

**Distribution:** Western North Atlantic from the east coast of the USA to Cuba, the Gulf of Mexico, and southern Brazil; also wide-ranging in the eastern Atlantic and Indo-Pacific.



***Lamna nasus*** (Bonnaterre, 1788)

POR

**Frequent synonyms / misidentifications:** None / None.**FAO names:** **En** - Porbeagle; **Fr** - Requin-taupe commun; **Sp** - Marrajo sardinero.

**Diagnostic characters:** A moderately large shark with a fusiform and very stout, tuna-like body and a moderately long pointed snout. Head with 5 long gill slits, all in front of pectoral-fin origin; gill arches without rakers; spiracles very small. Mouth broadly rounded in front and moderately long. Teeth moderately large and relatively few in number, alike in both jaws, erect, smooth-edged, with a single cusp and side-cusplets; the first 2 anterior teeth in each jaw moderately large and straight-cusped; a small intermediate tooth between the upper anterior and lateral teeth, this with a ventrolaterally directed cusp. Two unequal-sized dorsal fins, the first dorsal fin large, its origin anterior to inner corner of pectoral fin when latter is laid back, its apex bluntly or narrowly rounded, the second dorsal fin very small; pectoral fin moderately long, much shorter than head and not strongly falcate; anal-fin origin below origin of second dorsal fin; caudal fin lunate, its lower lobe strongly developed. Caudal peduncle very much flattened dorsoventrally, but expanded laterally, with a prominent keel on each side extending well out on caudal fin and a secondary keel below its posterior end on the caudal base. **Colour:** back, dorsal fins, and caudal fins bluish grey, free rear tip of first dorsal fin abruptly white, underside of head white or dusky, abdomen white.

**Size:** Maximum total length to possibly 3.7 m but most adults smaller and below 3 m; size at birth between 60 and 75 cm; males maturing at about 150 to 200 cm, females at 200 to 250 cm.

**Habitat, biology, and fisheries:** Coastal and oceanic, amphitemperate; common in cold seas north of Area 31 but marginal in the area. Most common on continental offshore fishing banks but coming close inshore and found on the high seas far from land. It ranges from the surface to at least 700 m depth. This is an active, strong-swimming shark, often in schools and feeding aggregations. Ovoviviparous (aplacental viviparous), number of young 1 to 5 per litter, gestation period possibly about 8 months. Feeds on small pelagic schooling fishes, demersal fishes, smaller sharks, squid and cuttlefish, and scavenged fishes from longlines. Heavily fished in the cold-temperate North Atlantic, with stocks severely depleted. An uncommon fisheries catch in the area, possibly primarily caught as bycatch.

**Distribution:** This species has centres of distribution in the North Atlantic and in a circumtemperate band of the southern Atlantic, southern Indian Ocean, and southern Pacific and Antarctic Oceans. Western Atlantic: Newfoundland and Gulf of St. Lawrence to New Jersey, possibly South Carolina (USA), and Bermuda; also southern Brazil to southern Argentina.

