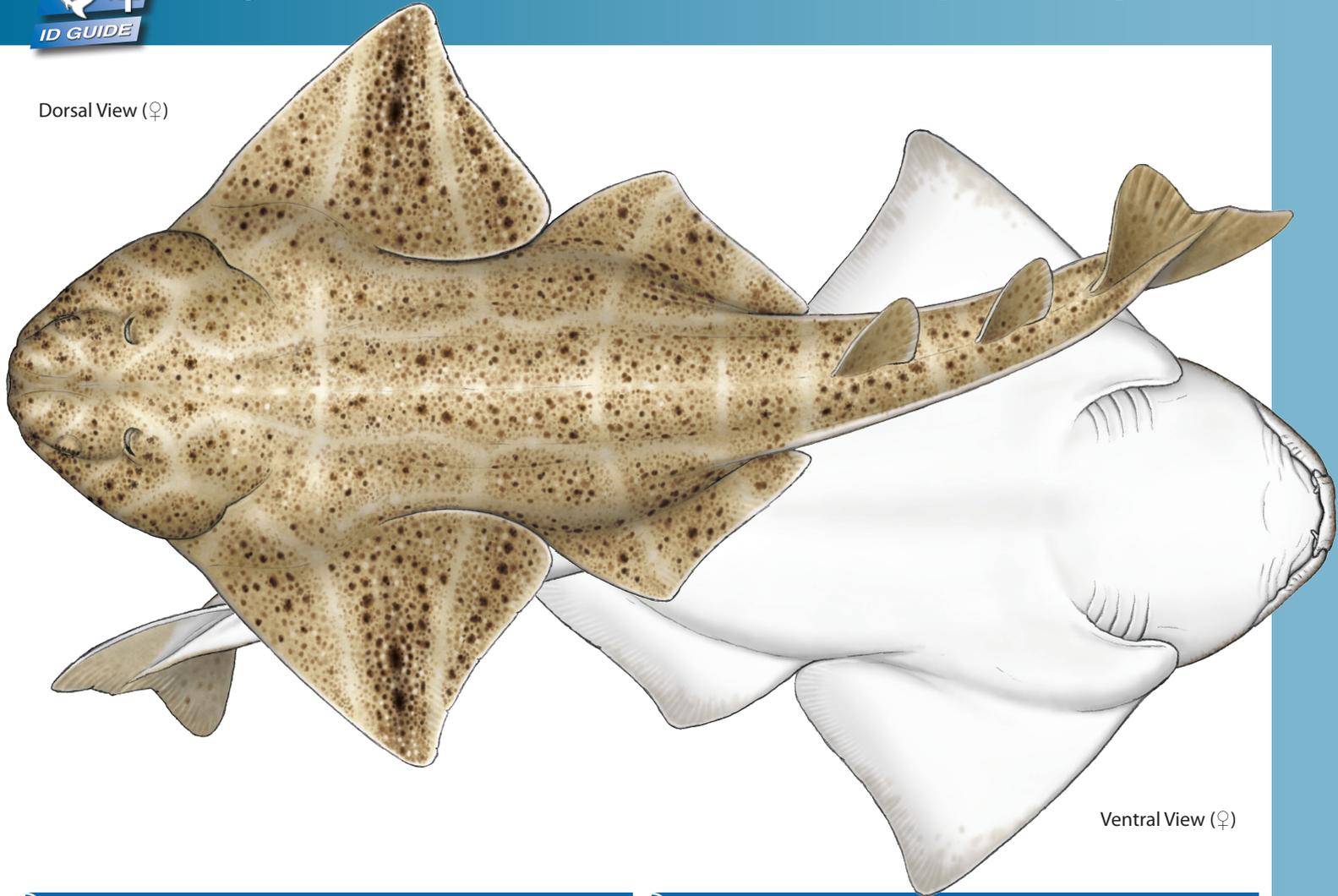


Dorsal View (♀)



Ventral View (♀)

## COMMON NAMES

**Angelshark**, Monkfish, Angel Fiddle Fish, Angel Puffy Fish, Angel Ray, Angelfish, Fiddle Fish, Ange de Mer Commun (Fr), Angelote (Es).

## SYNONYMS

*Squatina vulgaris* (Risso, 1810), *Squatina angelus* (Blainville, 1816), *Squatina laevis* (Cuvier, 1817), *Squatina lewis* (Couch, 1825), *Squalraia acephala* (de la Pylaie, 1835), *Squalraia cervicata* (de la Pylaie, 1835), *Squatina europaea* (Swainson, 1839).

## DISTRIBUTION

The Angelshark was historically found from Norway and Sweden to North Africa, including the Mediterranean and Black Seas, Iceland and the Canary Islands. Its range is now significantly reduced and it is considered extinct in the North Sea and parts of the northern Mediterranean (Morey *et al.*, 2006). It has been extirpated from the Bay of Biscay, the Adriatic Sea, the Irish Sea and English Channel (Dulvey *et al.*, 2003).



## APPEARANCE

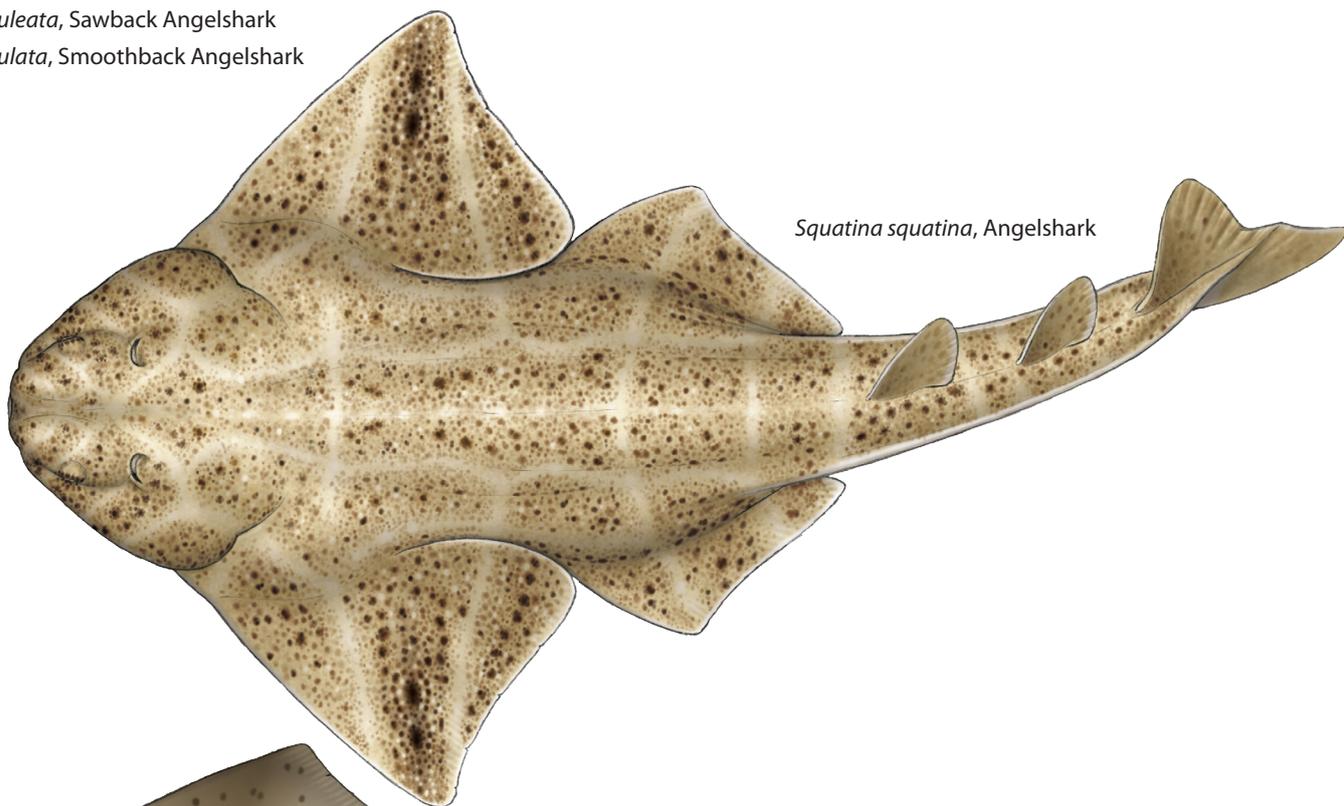
- Dorsoventrally flattened with large pectoral and pelvic fins.
- Two large dorsal fins on tail.
- Large caudal fin.
- Conical nasal barb and smooth or weakly fringed nasal flaps.
- No eyespot pattern on body.
- Grey to red-brown, sometimes to green-brown.
- Small white spots and scattered dark blotches.
- Light lines covering body in some populations.
- To maximum length of at least 183cm, possibly to 244cm.

The Angelshark is an extremely distinctive species in the northeast Atlantic. Dorsoventrally flattened it resembles a ray (Torpediniformes in particular) more than a shark, although the pectoral fins are not fused to the head. These fins are very high and wide with broadly rounded rear tips. Like the Torpediniformes, the dorsal and caudal fins are large and well developed with no associated spines. Small spines may be present on the midline from the head to the first dorsal fin and between the dorsal fin bases. They can also be found on the snout and above the eyes. The eyes are small in relation to the body and the spiracles are horizontally elongated (Compagno, 1984).

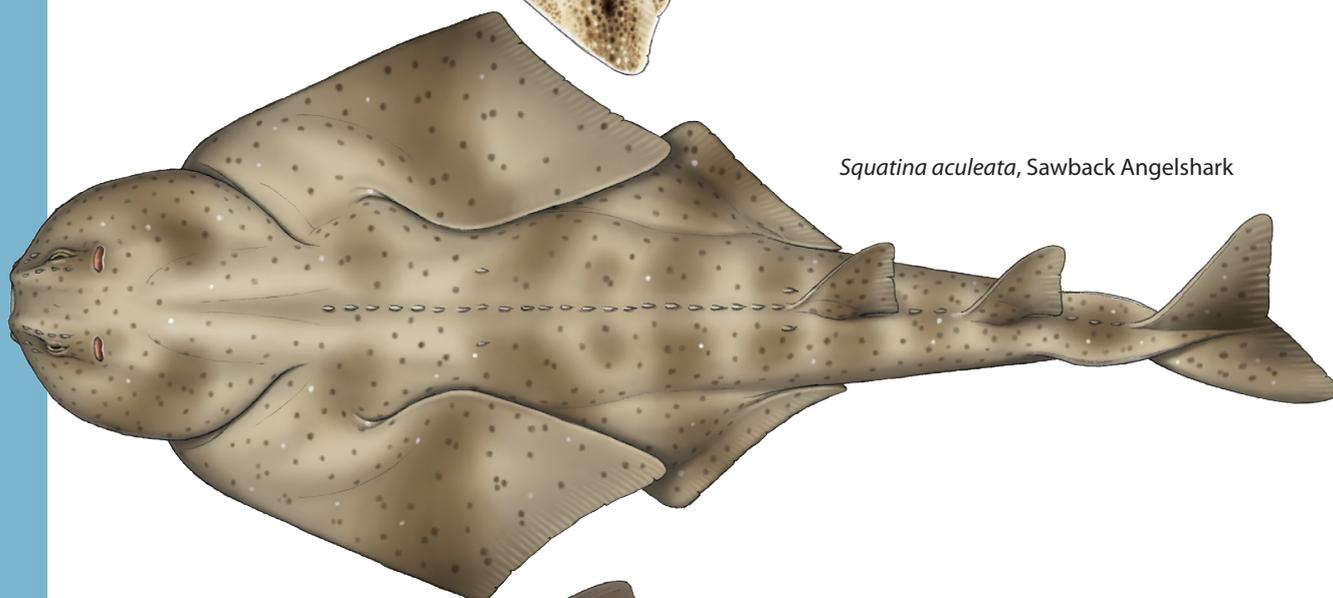
Dorsally the Angelshark can be grey to reddish brown and occasionally to green brown. There is normally a pattern of small white spots and scattered dark blotches (Compagno, 1984). In the Canary Islands, animals are regularly encountered by divers with lattice pattern of light lines across the back which camouflages them perfectly against the black and white sand (Murch, 2008). Ventrally it is paler to white. The largest recorded size is 183cm total length, although there have been unsubstantiated reports of individuals up to 244cm in length (Compagno, 1984).

## SIMILAR SPECIES

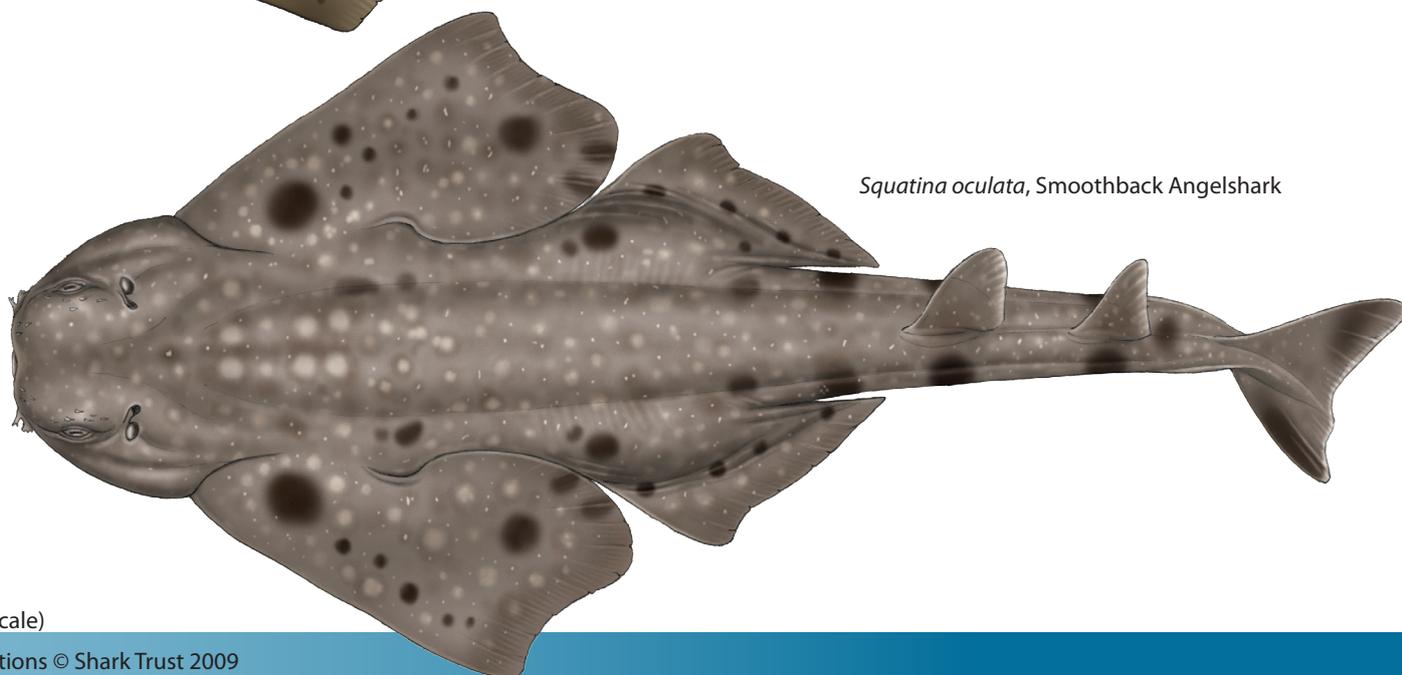
*Squatina aculeata*, Sawback Angelshark  
*Squatina oculata*, Smoothback Angelshark



*Squatina squatina*, Angelshark



*Squatina aculeata*, Sawback Angelshark

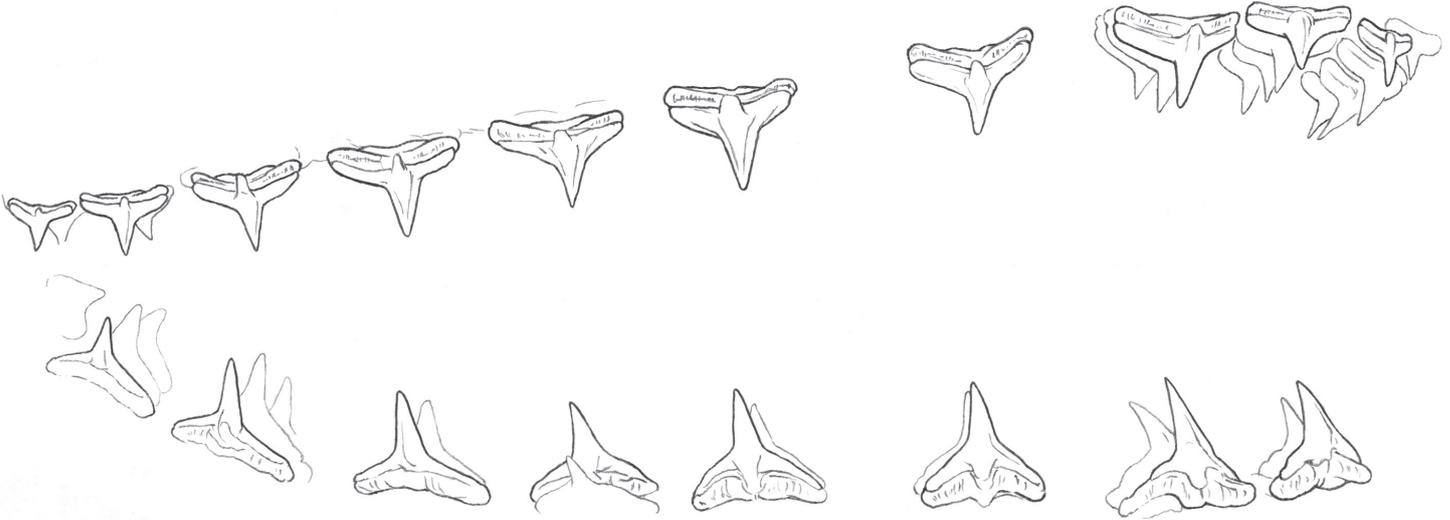


*Squatina oculata*, Smoothback Angelshark

(Not to scale)

## TEETH

Large, sharp, single-cusped teeth, 18–22 in each jaw (Ellis, 2003).



## ECOLOGY AND BIOLOGY

### HABITAT

The Angelshark is found around coasts and estuaries from 5–150m. A nocturnal species, it spends the day resting on soft substrate such as sand and mud with only its eyes and spiracles showing. Hunting at night, it can be seen swimming strongly off the bottom. In the north of its range the Angelshark is migratory, moving north during the summer and south during the winter (Compagno, 1984).

### EGGCASE

N/A

### DIET

The Angelshark feeds primarily on bony fishes, especially flatfishes but also other demersal fishes and skates, crustaceans and molluscs (Compagno, 1984). Specific prey items include Hake (*Merluccius merluccius*), Sparids (*Pagellus erythrinus*), grunts (*Pomadasyd spp.*) flatfish (*Bothus spp.*, *Citharus linguatula*), Sole (*Solea solea*), Squid (*Loligo vulgaris*), Cuttlefish (*Sepia officinalis*, *Sepioida spp.*), and crustaceans (*Dorippe lanata*, *Geryon tridens*, *Dromia vulgaris*, *Goneplax rhomboides*, *Macropipus corregatus*, *Atelecyclus rotundatus*). It occasionally swallows more unusual items including eelgrass and seabirds (a single record of a cormorant exists) (Morey *et al.*, 2006).

### REPRODUCTION

In the Mediterranean, females reach sexual maturity at 128–169cm in length. Males mature smaller at 80–132cm. Age at maturity and longevity are not currently known. An ovoviviparous species, the Angelshark gives birth to litters of 7–25 pups which can vary from 24–30cm in length, apparently in relation to the size of the female. The gestation period is 8–10 months with parturition occurring around July in the north of its range. In the Mediterranean birth occurs earlier around December and January (Morey *et al.*, 2006).

## COMMERCIAL IMPORTANCE

There are currently no directed fisheries for the Angelshark but it is taken as bycatch in trawl, longline and set net fisheries across much of its reduced range. If landed its flesh can be used for human consumption, either fresh or dried-salted, its liver for oil and its carcass can be processed for fishmeal. It is often discarded however (Morey *et al.*; 2006).

## THREATS, CONSERVATION, LEGISLATION

Due to its nature of lying motionless on sandy and muddy bottoms during the day, the Angelshark is highly susceptible to trawl fisheries. Combined with its relatively large size and the increase in trawl fishing effort in the northeast Atlantic and Mediterranean over the last 50 years, it has been significantly affected by fishing mortality across its range. Anthropogenic disturbance through habitat degradation and an increase in recreational scuba diving may have also had an adverse effect on populations (Morey *et al.*, 2006).

Evidence of dramatic declines in Angelshark populations can be found from as far back as the start of the 20th century. Historic data from a tuna trap operating in the northern Tyrrhenian Sea shows that between 1898 and 1905, 134 specimens were caught. Between 1914 and 1922, this had dropped to 15 specimens. This reduction in numbers coincides with the start of trawling activity in the area. Currently, catches are reported from Albania, France, Malta, Tunisia and Turkey, combined catches from which dropped from 17 tons a year in the 1980's to 1 or 2 tons a year in the 1990's (Morey *et al.*, 2006).

The Angelshark has been proposed for protection under both the OSPAR Priority List of Threatened Species and the UK Wildlife and Countryside Act (1981), but only the latter application was successful. This means it is protected from killing, injury or taking up to 6 nautical miles from English and Welsh coastal baselines. It is listed under Annex III of the Barcelona Convention as it is a species whose exploitation is limited in the Mediterranean.

In January 2009, all species of angelshark received protection from the European Council in all EC waters, meaning that they cannot be targeted or retained if taken as bycatch. As elasmobranchs have no swim bladder that can overinflate or rupture, they are more likely to survive capture and release than teleost fish (Defra, 2008).

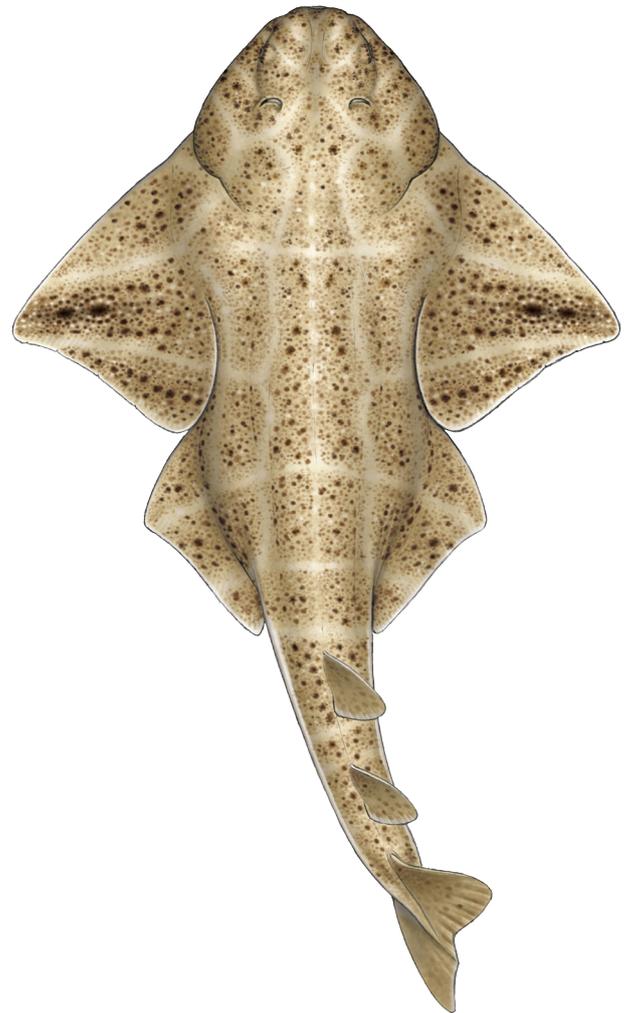
Throughout the rest of its range, the Angelshark is indirectly protected in 3 marine reserves around the Balearic Islands. These reserves, along with places in the Canary Islands, are the only areas left in the Angelshark's former range where it can still be regularly encountered, leading to an increase in recreational dive tourism (Murch, 2008).

## IUCN RED LIST ASSESSMENT

Critically Endangered (2006).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth and powerful jaws.
- Abrasive skin.



## REFERENCES

- COMPAGNO, L. J. V. 1984. FAO Species Catalogue: Volume 4, Part 1, Sharks of the World, An Annotated and Illustrated Checklist of Species Known to Date. FAO. Rome, Italy.
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- MOREY, G., SERENA, F., MANCUSI, C., FOWLER, S. L., DIPPER, F., ELLIS, J. 2006. *Squatina squatina*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. [www.iucnredlist.org](http://www.iucnredlist.org).
- MURCH, A. 2008. Chasing Angels – Diving with Angel Sharks in the Canary Islands. Shark Diver Magazine. December, 2008.

Text: Richard Hurst.  
Illustrations: Marc Dando.

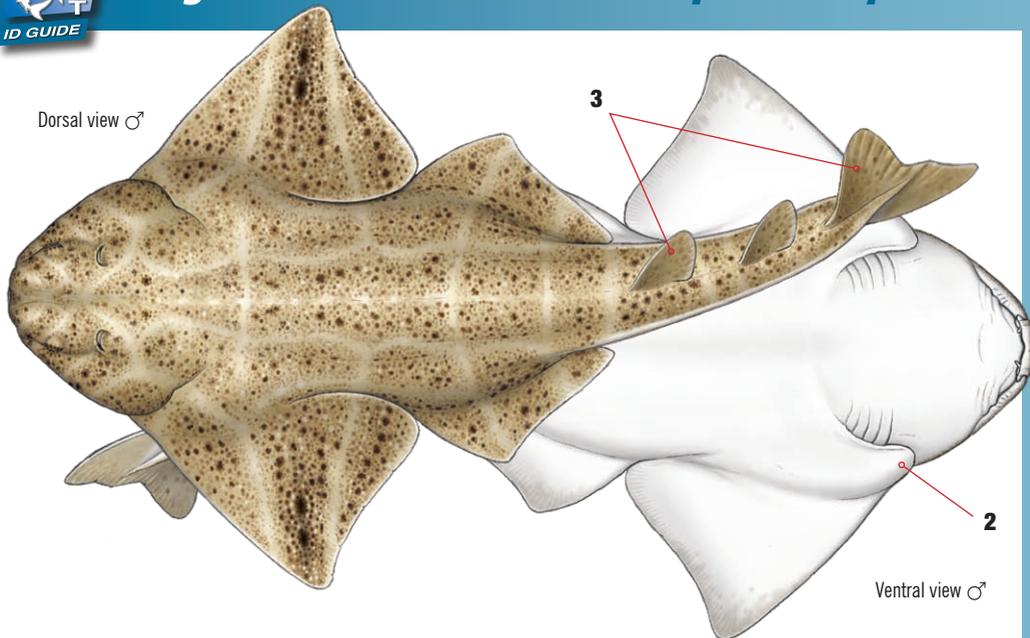
### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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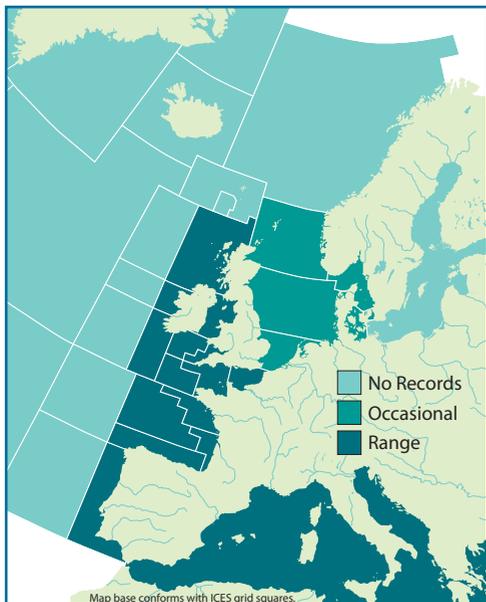


## SCIENTIFIC NAME

*Squatina squatina* (Linnaeus, 1758).

## DISTRIBUTION

Norway to North Africa, including the Mediterranean and Black Seas. Range now much reduced due to fishing pressure<sup>iii</sup>.



## COMMON NAME

**ANGELSHARK**, Monkfish, Angel Fiddle Fish, Angel Puffy Fish, Angel Ray, Angelfish, Fiddle Fish, Ange de Mer Commun (Fr), Angelote (Es).

## IDENTIFICATION

- 1 Dorsoventrally flattened.
- 2 Pectoral fins not fused to the head.
- 3 Large dorsal and caudal fins!

## COLOUR

- Grey to red-brown dorsally.
- Small white spots and scattered dark blotches<sup>i</sup>.
- Pattern of light lines in some populations<sup>iv</sup>.
- No eyespot pattern.
- Ventrally white<sup>i</sup>.

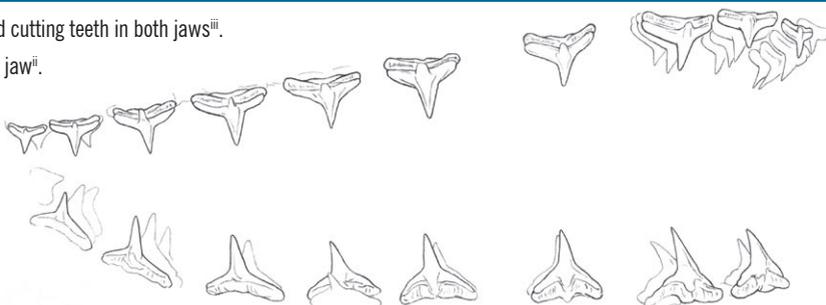
## BIOLOGY AND SIZE

- Birth: 24–30cm. Mature: 128–169cm ♀, 80–132 ♂<sup>iii</sup>. Max TL: 183cm<sup>i</sup>.
- Litters of 7–25 pups have been recorded after gestation periods of 8–10 months<sup>iii</sup>.
- Feed predominantly on teleost fish, particularly flatfish. Also eat other demersal fish, skate, crustaceans and molluscs<sup>iii</sup>.

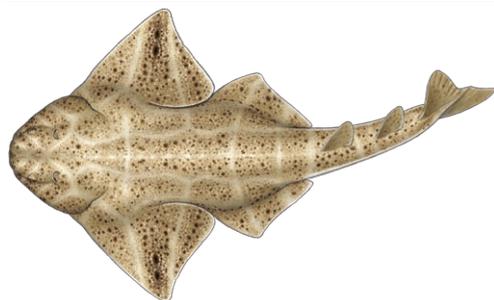


## TEETH

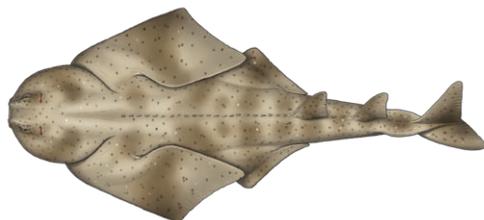
- Oblique cusped cutting teeth in both jaws<sup>iii</sup>.
- 18–22 in each jaw<sup>i</sup>.



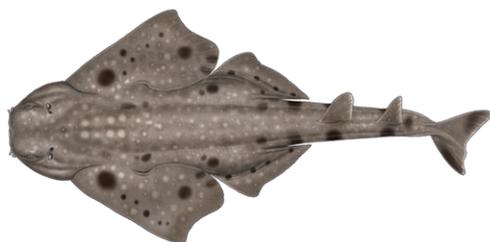
## SIMILAR SPECIES



- Squatina squatina*, **Angelshark**



- Squatina aculeata*, **Sawback Angelshark**



- Squatina oculata*, **Smoothback Angelshark**

## HABITAT

- 5–150m, found around coasts, estuaries and features such as sandbanks.
- Nocturnal, resting during the day with only eyes and spiracles showing above the substrate. Hunt actively at night.
- May migrate in the north of its range, moving south in winter and returning north in summer<sup>i</sup>.

## CONSERVATION STATUS

- Significantly impacted by fishing due to its life history and habitat preference. Catches have dropped rapidly since species specific records have been kept. Extirpated from much of its range<sup>iii</sup>.
- Red List status:** Critically Endangered (2006).

## COMMERCIAL IMPORTANCE

- No targeted fisheries but taken as bycatch in trawl, longline and set net fisheries across its range.
- Previously landed for human consumption, liver oil and fishmeal<sup>iii</sup>.
- Prohibition on commercial fishers retaining this species in all ICES areas.

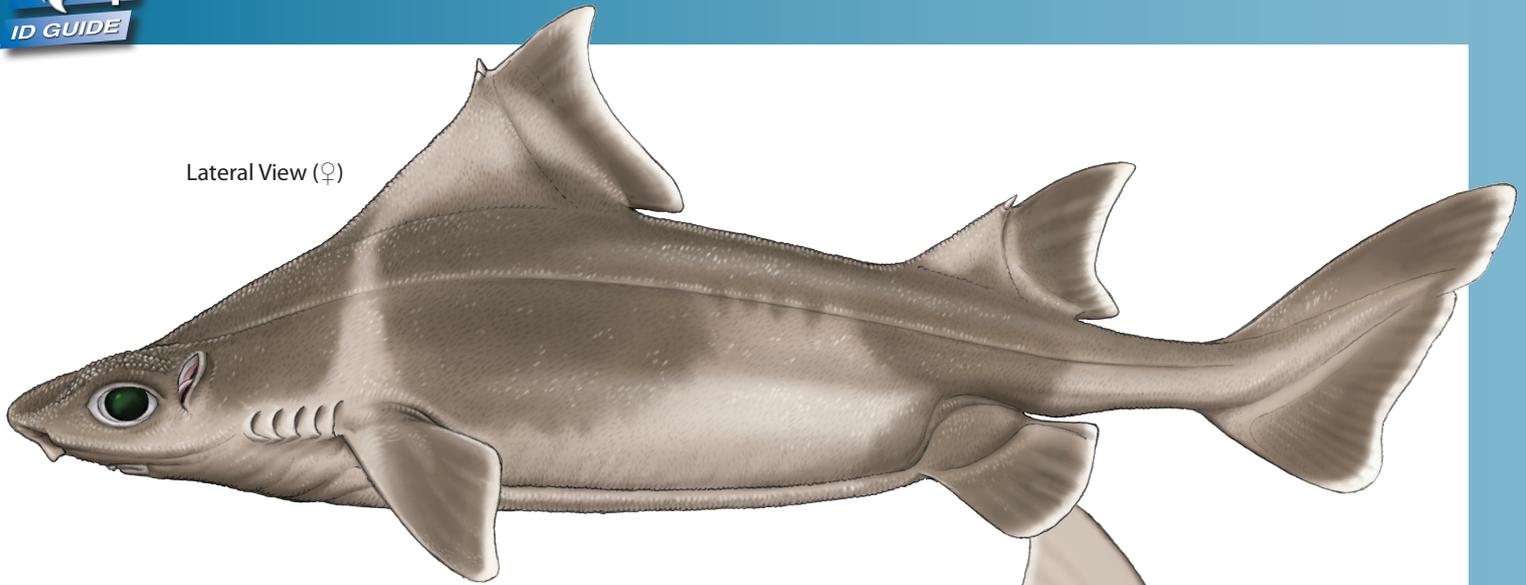
## HANDLING

- Handle with care.
- Sharp teeth and powerful jaws.
- Abrasive skin.

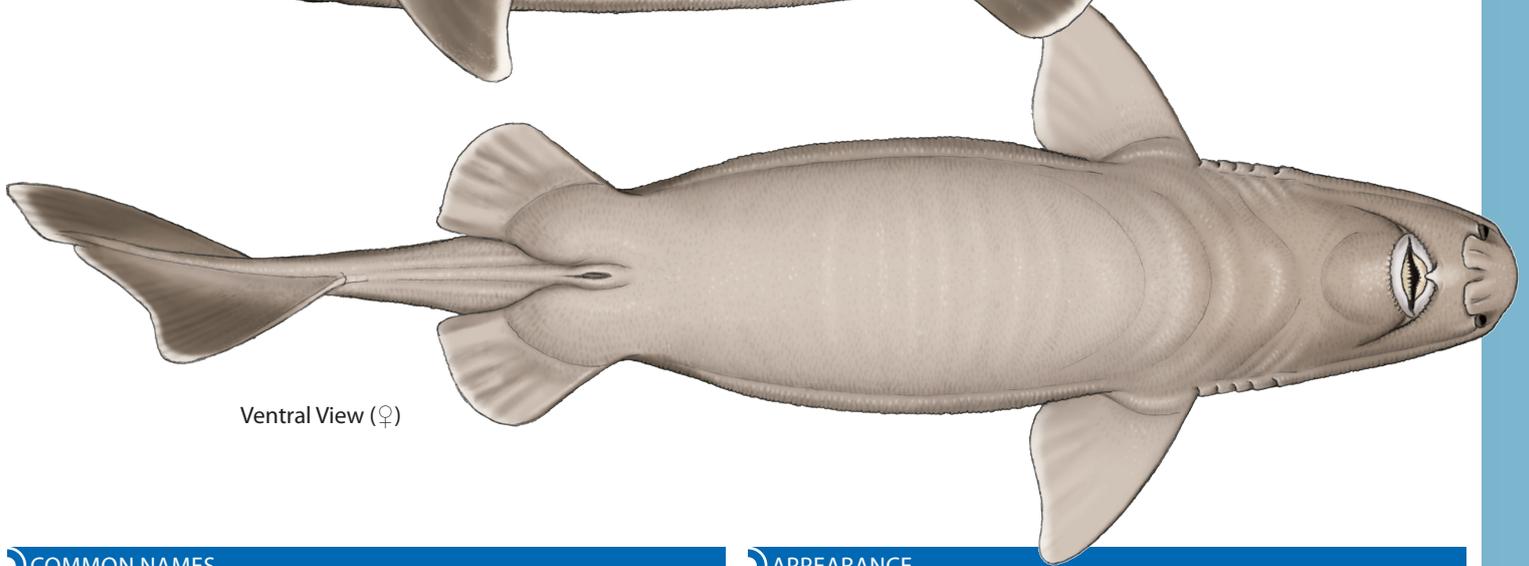
## REFERENCES

- Compagno, L. J. V.; 1984. FAO.
- Ellis, J.; 2003. Shark Trust.
- Morey, G. *et al.*; 2006. IUCN Red List.
- Murch, A.; 2008. Shark Diver Magazine.

Lateral View (♀)



Ventral View (♀)



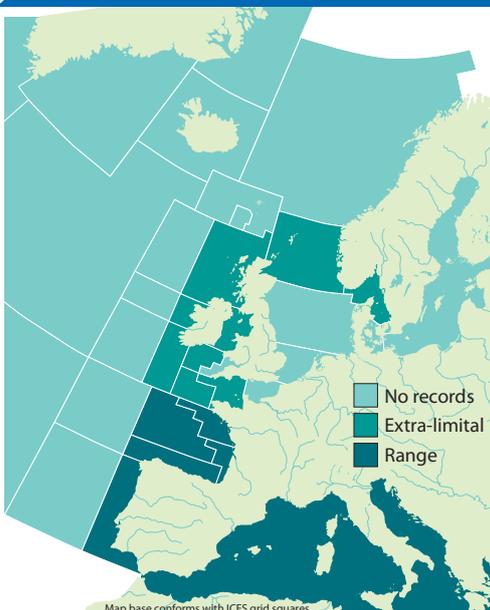
### COMMON NAMES

**Angular Rough Shark**, Centrina Shark, Flatiron Shark, Prickly Dogfish, Centrine Commune (Fr), Cerdo Marino (Es).

### SYNONYMS

*Squalus centrina* (Linnaeus, 1758), *Centrina salviani* (Risso, 1826), *Centrina oxynotus* (Swainson, 1839), *Centrina vulpecula* (Moreau, 1881).

### DISTRIBUTION



The Angular Rough Shark has a core range from the Bay of Biscay to Senegal including the Mediterranean Sea. It has been found as far north as the British Isles and rarely to the western Baltic Sea. It is known as far south as South Africa (Compagno, 1984).

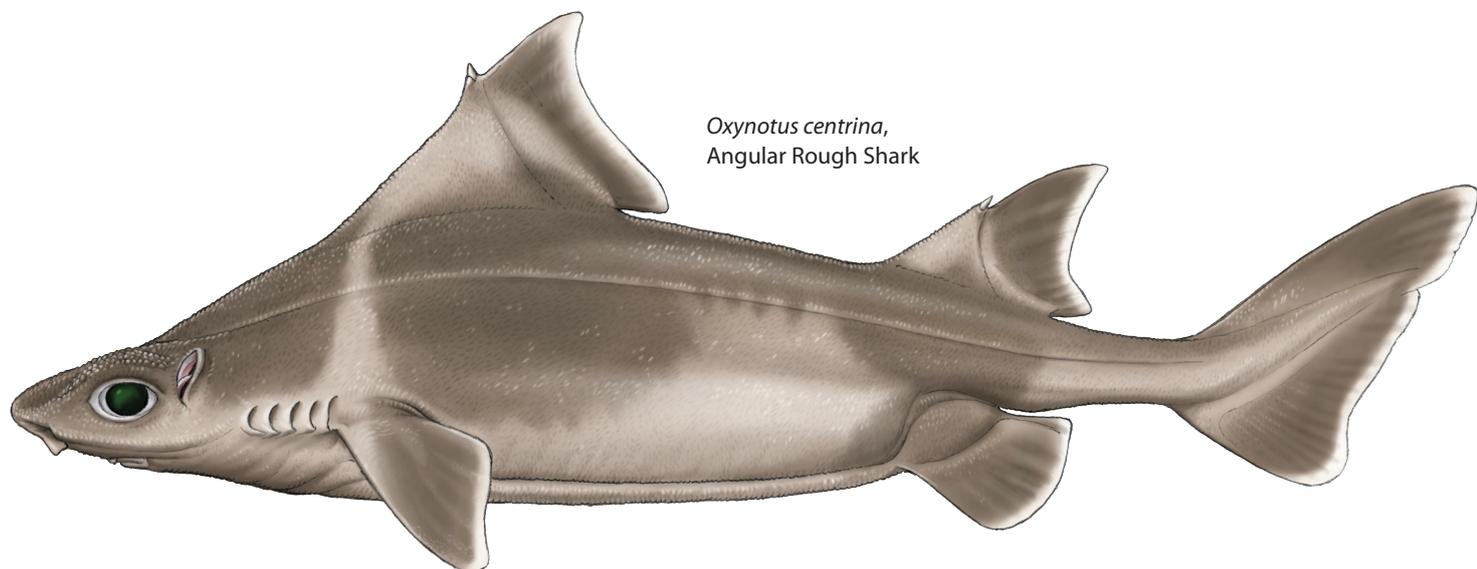
### APPEARANCE

- Compressed body, triangular in cross section.
- Broad, flattened head with flat, blunt snout.
- Two large, sail-like dorsal fins.
- No anal fin.
- Heavy ridges over eyes covered with enlarged denticles.
- Extremely large, vertically expanded spiracles.
- Grey or grey-brown dorsally.
- Darker blotches on head and sides.
- Light horizontal line on cheek below the eye.

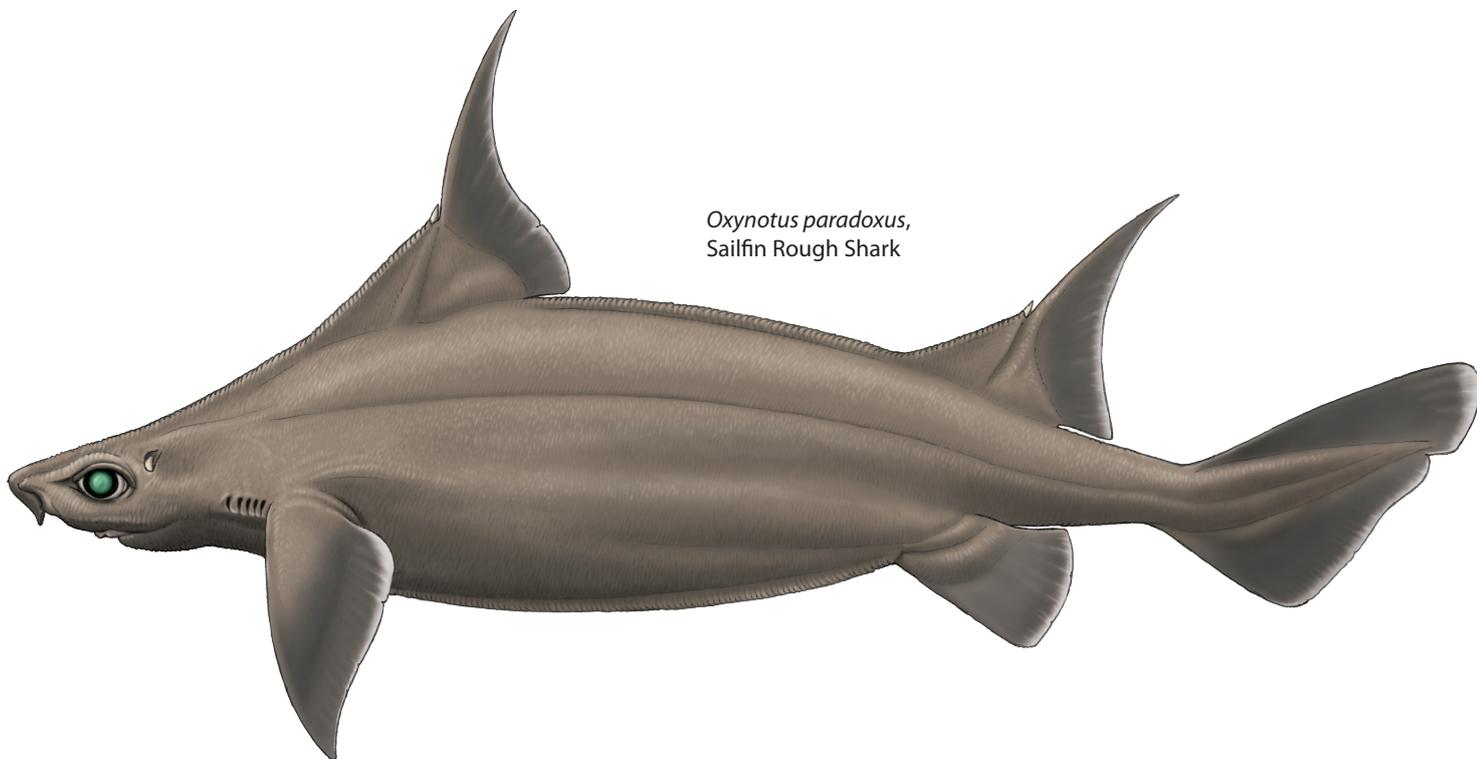
One of only two species of Oxynotidae found in the northeast Atlantic, the Angular Rough Shark is unlikely to be confused with any species other than the Sailfin Rough Shark, *Oxynotus paradoxus*. The most useful features in distinguishing these species are the spiracles, dorsal fins and dermal denticles. The spiracles of the Angular Rough Shark are very large and vertically expanded while the spiracles of the Sailfin Rough Shark are relatively small and almost circular. The first dorsal fin spine of the Sailfin Rough Shark leans backwards while it leans forwards in the Angular Rough Shark (Avezedo *et al.*, 2003). For details and SEM images of the differing dermal denticles see Avezedo *et al.* (2003).

## SIMILAR SPECIES

*Oxynotus paradoxus*, Sailfin Rough Shark



*Oxynotus centrina*,  
Angular Rough Shark



*Oxynotus paradoxus*,  
Sailfin Rough Shark

(Not to scale)

### TEETH

The upper teeth are lanceolate, the lower teeth blade-like and arranged into less than 12 rows (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Angular Rough Shark is a little known shark of the continental shelf and upper slope from 60–660m, most common below 100m. In the northern Mediterranean it is rarely found deeper than 200m. There is a single record of an individual captured at 800m (Sion *et al.*, 2004). It is most commonly associated with coralline and muddy substrates (Bradaï *et al.*, 2007).

#### EGGCASE

N/A

#### DIET

The feeding habits of the Angular Rough Shark are poorly understood but it is known to feed on polychaetes, crustaceans and molluscs (Bradaï *et al.*, 2007).

#### REPRODUCTION

It has been reported that both male and female Angular Rough Sharks mature at 50–70cm. Some studies have shown a slightly larger size at maturity for females than males (66cm as opposed to 60cm). It is an ovoviviparous species producing litters of 10–12 pups annually. These pups measure between 21 and 24cm in length at birth (Bradaï *et al.*, 2007).

## COMMERCIAL IMPORTANCE

The Angular Rough Shark constitutes a minor bycatch of offshore trawl fleets. It is sometimes utilised for fishmeal, oil and dried-salted for human consumption (Compagno, 1984). It has been reported that fishermen in the Mediterranean believe rough sharks to be bad luck and discard them immediately on capture (Bradaï *et al.*, 2007).

## THREATS, CONSERVATION, LEGISLATION

The Angular Rough Shark is taken in the Mediterranean as bycatch by bottom and pelagic trawl fisheries. As its habitat lies entirely in the depth range in which commercial fisheries operate, bycatch mortality is likely to be high. The legal minimum mesh size in much of the Mediterranean is approximately 20mm, meaning that the probability of capture before breeding is high. Throughout much of the Mediterranean rough sharks are discarded, although it is not known what the survival rate of these individuals is. In the northeast Atlantic, deepwater trawl fisheries are expanding in both range and effort with regulation often ineffective or none existent. However, species specific population data from these fisheries is lacking, making quantifying any declines difficult. There are currently no management plans in place for the conservation of the Angular Rough Shark (Bradaï *et al.*, 2007).

## IUCN RED LIST ASSESSMENT

Vulnerable (2007).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large dorsal spines.
- Abrasive skin.
- Sharp teeth.

### REFERENCES

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Text: Richard Hurst.  
Illustrations: Marc Dando.

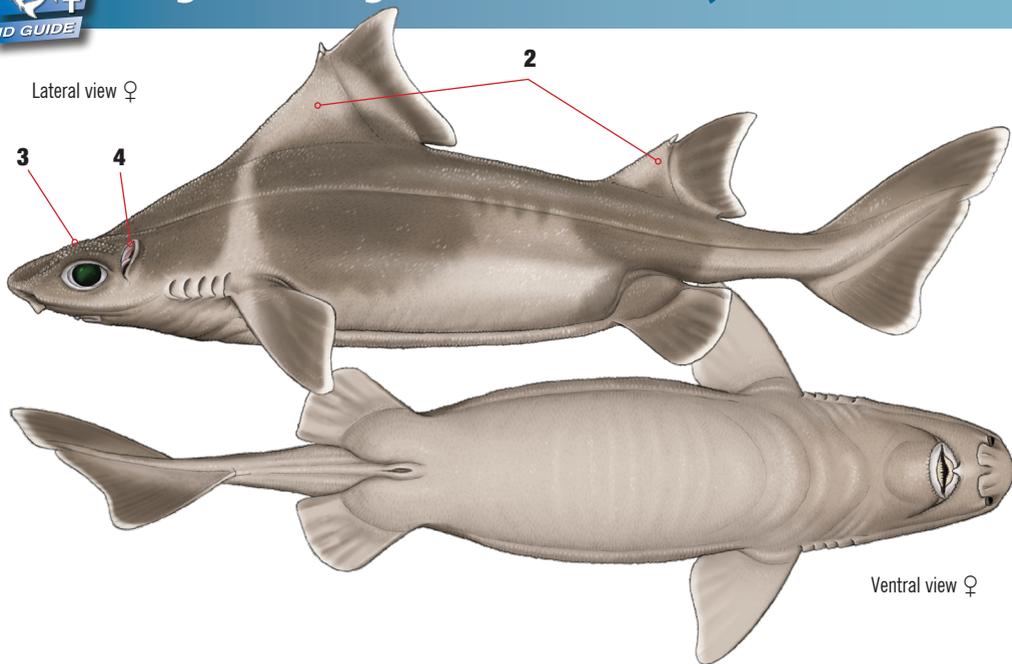
#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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Lateral view ♀

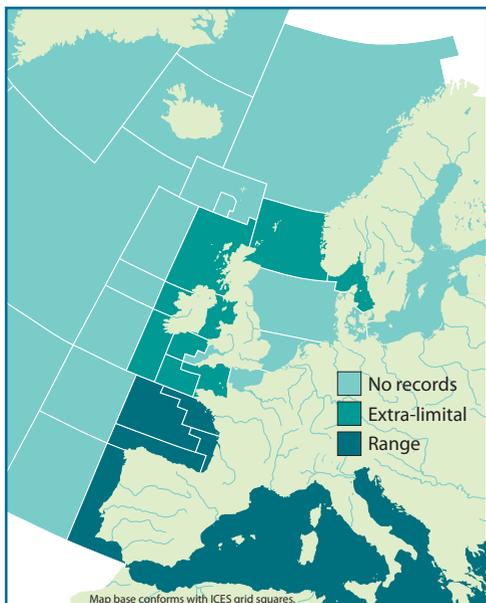
Ventral view ♀

## SCIENTIFIC NAME

*Oxynotus centrina* (Linnaeus, 1758).

## DISTRIBUTION

Bay of Biscay to Senegal, including the Mediterranean.  
Vagrant north to Norway and south to South Africa<sup>ii</sup>.



## COMMON NAME

**ANGULAR ROUGHSHARK**, Prickly Dogfish, Flatiron Shark, Centrina Shark, Centrine Commune (Fr), Cerdo Marino (Es).

## IDENTIFICATION

- 1 Compressed body, triangular in cross section.
- 2 Two large, sail-like dorsal fins with spines.
- 3 Heavy ridges over eyes with enlarged denticles.
- 4 Extremely large, vertically expanded spiracles<sup>ii</sup>.

## COLOUR

- ⊙ Grey or grey brown dorsally.
- ⊙ Dark blotches on head and flanks.
- ⊙ Light horizontal line below eye<sup>iii</sup>.

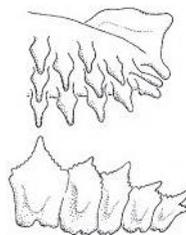
## BIOLOGY AND SIZE

- ⊙ Born: 21–24cm. Mature: 50–70cm<sup>i</sup>. Max TL: 150m<sup>ii</sup>.
- ⊙ Ovoviviparous, litters of 10–12 pups are produced annually.
- ⊙ Known to feed on polychaetes, crustaceans and molluscs<sup>i</sup>.

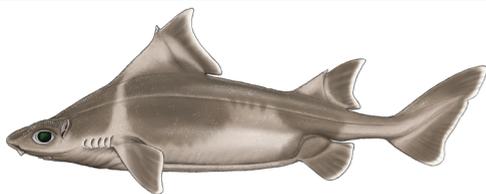
## TEETH



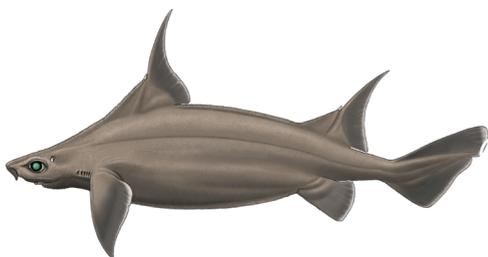
- Lanceolate upper teeth.
- Lower teeth blade-like, less than 12 rows<sup>i</sup>.



## SIMILAR SPECIES



● *Oxynotus centrina*, **Angular Roughshark**



● *Oxynotus paradoxus*, **Sailfin Rough Shark**

## CONSERVATION STATUS

- Not targeted but bycatch mortality is likely to be high as its distribution and depth range lie entirely within heavily exploited areas<sup>i</sup>.
- **Red List status:** Vulnerable (2007).

## COMMERCIAL IMPORTANCE

- Minor bycatch of offshore trawl fleets.
- Sometimes utilised for human consumption and fishmeal, liver oil is valuable<sup>ii</sup>.
- Believed to be bad luck in the Mediterranean and are discarded immediately. Survival rates may be high<sup>i</sup>.

## HANDLING

- Handle with care.
- Large dorsal spines.
- Abrasive skin.
- Sharp teeth.

## REFERENCES

- Bradaï, M. *et al*; 2007. IUCN Red List.
- Compagno, L. J. V.; 1984. FAO.
- Compagno, L. J. V *et al*; 2005. HarperCollins Publishers.

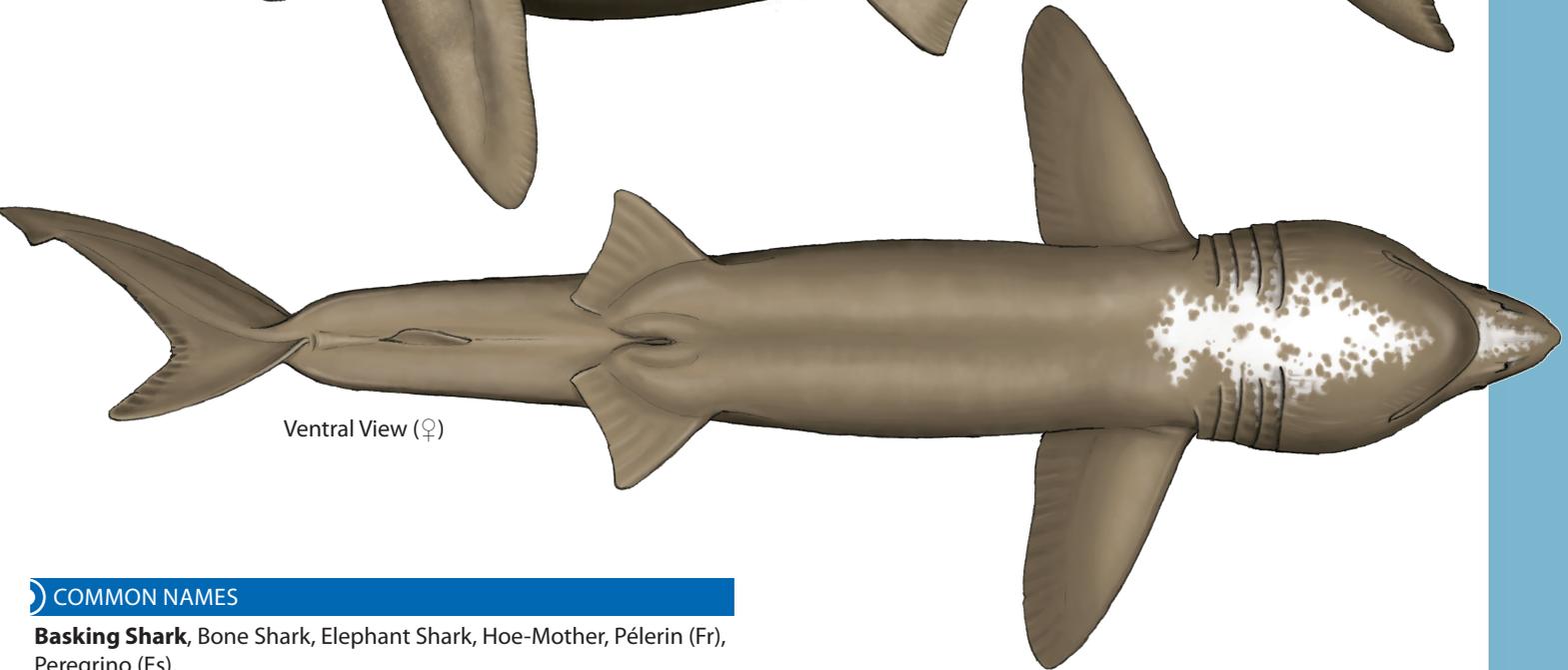
## HABITAT

- 60–600m, most common below 100m. Record from western Ionian Sea from 800m.
- Rarely found deeper than 200m in the northern Mediterranean.
- Commonly associated with muddy and coralline bottoms<sup>i</sup>.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Basking Shark**, Bone Shark, Elephant Shark, Hoe-Mother, Pélerin (Fr), Peregrino (Es).

### SYNONYMS

*Squalus maximus* (Gunnerus, 1765), *Halsydrus pontoppidani* (Neill, 1809), *Tetoras angiova* (Rafinesque, 1809), *Squalus aunnerianus* (Blainville, 1810), *Squalus homianus* (Blainville, 1810), *Squalus pelegrinus* (Blainville, 1810), *Squalus peregrinus* (Blainville, 1811), *Squalus quneri* (Blainville, 1816), *Squalus shavianus* (Blainville, 1816), *Scoliophis atlanticus* (Anon., 1817), *Squalus isodus* (Macri, 1819), *Squalus rostratus* (Macri, 1819), *Squalus elephas* (LeSueur, 1822), *Squalus rasleighanus* (Couch, 1838), *Squalus rhinoceros* (Mitchell,

in DeKey, 1842), *Squalus cetaceus* (Gronow, 1854), *Polyprosopus macer* (Couch, 1962), *Cetorhinus blainvillei* (Brito Capello, 1870), *Selachus pennantii* (Cornish, 1885), *Cetorhinus maccoyi* (Barrett, 1933), *Cetorhinus maximus forma infanuncula* (Deinse and Adriani, 1953), *Cetorhinus maximus normani* (Siccardi, 1960), *Halsydrus maximus* (Gunnerus, 1765), *Halsydrus maccoyi* (Barrett, 1933), *Cetorhinus rostratus* (Macri, 1819), *Cetorhinus normani* (Siccardi, 1960)

### DISTRIBUTION

The Basking Shark has a circumglobal distribution although it appears to be fairly disjunct with limited genetic exchange between populations. In the east Atlantic it is known from Russia and northern Norway, Iceland, the British Isles, all through the Mediterranean Sea and as far south as Senegal. It is also found in Namibia and South Africa. In the northwest Atlantic it is found from Canada to the northern Gulf of Mexico and in the southwest Atlan-



tic it is known from southern Brazil to southern Argentina and the Falkland Islands.

In the west Pacific it can be found in south Australia and New Zealand, further north in Japan, the Korean Peninsula, Taiwan and China. In the northeast Pacific It is known from the Gulf of Alaska to the Gulf of California, including the Aleutian Islands and further out, the Hawaiian Islands. In the southeast Pacific it can be found from Ecuador to southern Chile.

Currently only one species of Cetorhinidae is recognised but Siccardi (1960, 1961) suggested that there are four distinct species; *C. maximus* and *C. rostratus* in the North Atlantic and Mediterranean, *C. normani* in the western South Atlantic and *C. maccoyi* from southern Australia. While most authors disagree with this assessment it appears that due to limited genetic interchange between stocks, distinct sub-populations may exist. These could be a North Pacific population (with possible distinction between the northeast and northwest Pacific), a North Atlantic population (with possible distinction between the northeast and northwest Atlantic and the Mediterranean Sea), a South American population (with possible distinction between the southwest Atlantic and the southeast Pacific), a South African population (including Namibia) and an Australia-New Zealand population (if not separate) (Compagno, 2001).

## APPEARANCE

- Enormous gill slits which nearly encircle the head.
- Pointed snout.
- Huge subterminal mouth with minute hooked teeth.
- Eyes tiny relative to body size.
- Large first dorsal, pectoral and pelvic fins.
- Small second dorsal and anal fin.
- Lunate caudal fin with subterminal notch and lobe.
- Blackish to grey-brown, grey or blue-grey dorsally.
- Similar although sometimes lighter ventrally.
- Often irregular light blotches on underside of head and abdomen.
- Flanks sometimes with lighter striping and spots.
- To a maximum of 1,220cm but most do not exceed 980cm.

The Basking Shark is an enormous species which is difficult to confuse with any other in the northeast Atlantic. Its gills are elongated and stretch almost completely around the head. Whilst feeding these gills billow out in a way reminiscent of spinnakers, revealing the modified

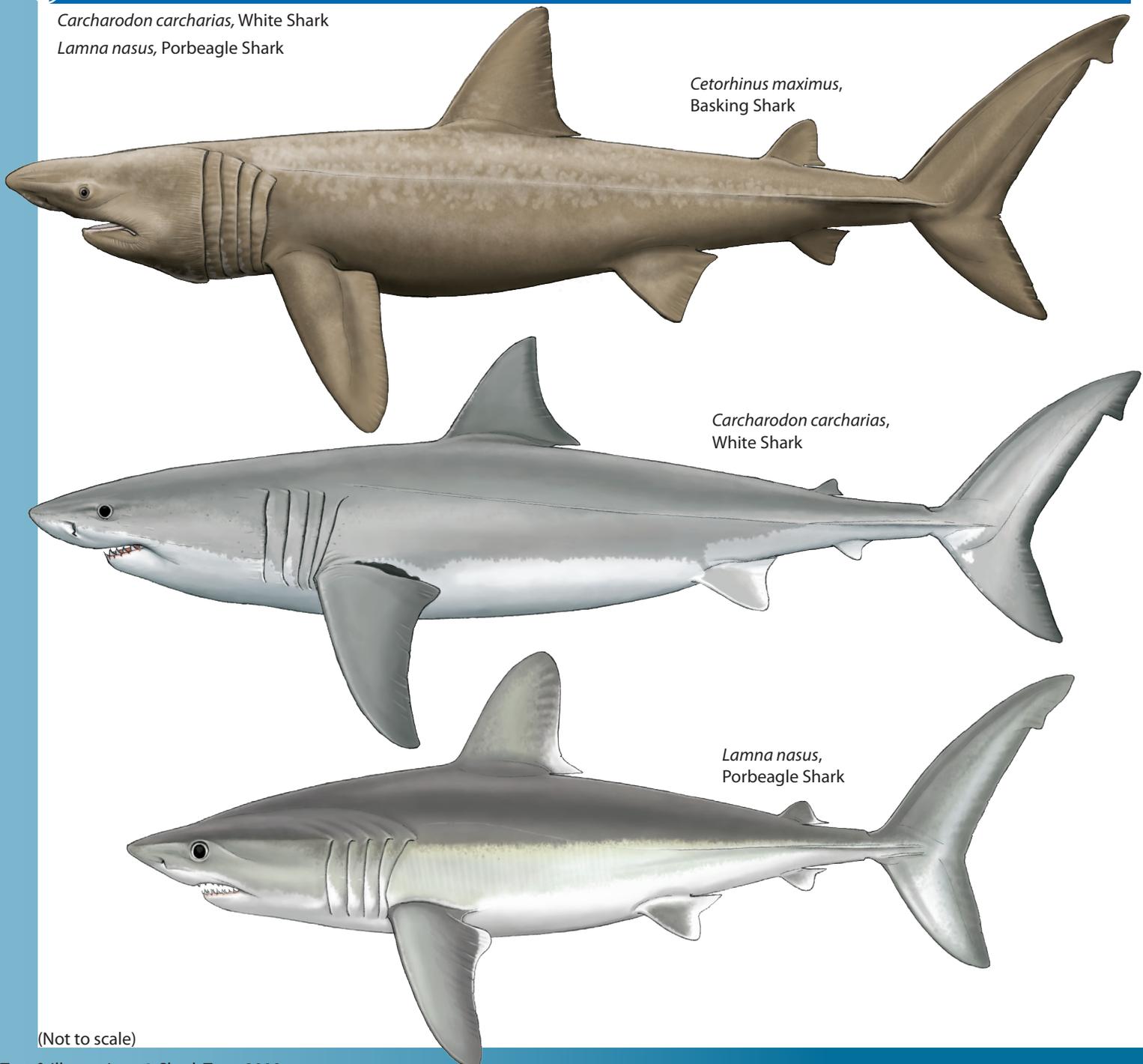
dermal denticle gill rakers used to filter the sea water for plankton. The pectoral fins are large and originate very close to the fifth gill slits. The first dorsal fin is large with a rounded tip and a free rear tip. It originates behind the pectoral fins with no overlap. The pelvic fins are large with straight edges and a fairly acute tip. The second dorsal fin is small and set slightly in front of the anal fin. The caudal fin is lunate with a strong subterminal notch and lobe (Compagno, 2001).

Dorsally it is normally grey although it can be blackish, grey-brown or blue grey. Ventrally it is very similar although sometimes lighter. There is usually a pattern of light blotches on the underside of the head and abdomen and lighter striping and spots on the flanks. There are two reports of albino specimens from the North Atlantic (Knickle *et al.*, Unknown). The maximum reported size of the Basking Shark is 1,220cm and the existence of 1,520cm long specimens has been hypothesised. Most adults do not exceed 980cm however (Compagno, 2001).

## SIMILAR SPECIES

*Carcharodon carcharias*, White Shark

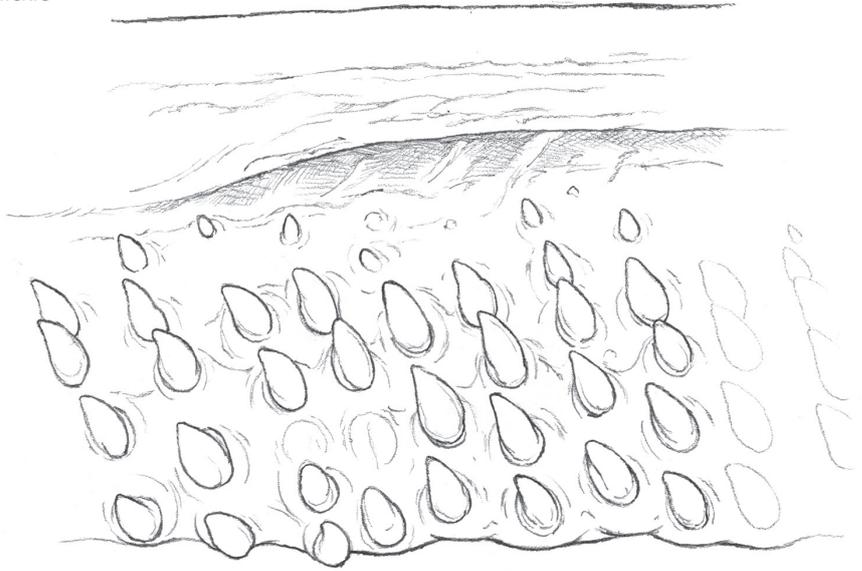
*Lamna nasus*, Porbeagle Shark



(Not to scale)

### TEETH

The teeth are minute and hooked. There is a wide space on the centre of the upper jaw with only scattered teeth (Knickle *et al.*, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

A coastal to oceanic species, the Basking Shark is normally encountered at or near the surface but has been recorded as deep as 1,264m (Gore *et al.*, 2008). It is known to venture inshore to shallow bays, almost to the surf line, and is regularly sighted from land at certain times of the year. Records from the open ocean are rarer but aerial surveys and pelagic driftnet catches show that it is found over the oceanic basins. The majority of records from the United Kingdom, Japan and Newfoundland are from water 8–14°C in temperature, although most records from New England are in water from 11–24°C with most of these over 16°C. It seems to prefer ocean fronts where different masses of water meet and where plankton may flourish. These areas include headlands, islands and bays with strong tidal flow (Compagno, 2001).

#### REPRODUCTION

As with other species in the family Lamnidae, the Basking Shark reproduces viviparously with embryos nourished by a continuous supply of unfertilised ova, a process known as oophagy or oviphagy. Very little else is known as only one gravid female has been recorded, suggesting that these animals segregate from the general population. Gestation periods of 1–3.5 years have been proposed with estimates of the size at birth from 100–170cm (Pauly, 2002; Martin, Unknown). It is believed that males reach maturity around 460–610cm in length at an age of 12–16 years. No data for female maturity or the longevity of either sex is available, although extrapolation from other Lamnoids would suggest a female maturity of around 20 years and an age of at least 50 years (Martin, Unknown).

#### DIET

The Basking Shark is a passive filter feeder, swimming with its mouth open and straining the water through its pharynx for plankton. Modified dermal denticles called gill rakers, coated in mucus secreted in the pharynx helps capture these organisms (Compagno, 2001). It varies in this respect from other filter feeding elasmobranchs (*Rhincodon typus*, *Megachasma pelagios*, *Manta birostris*, *Mobula* spp.) which actively pump seawater across their filtering mechanisms and as such, may take more active nektonic prey such as small schooling fish and crustaceans (Pauly, 2002). Compagno (2001) lists the main food items as small copepods (including calanids), barnacles, decapoda, stomatopod larvae and fish eggs (Compagno, 2001). The common name of the Basking Shark comes from the fact that whilst feeding it appears to be basking at the surface, its first dorsal fin fully exposed and its back partly exposed. Feeding in this way it has been estimated it can filter 2,000 tons of water per hour (Knickle *et al.*, Unknown).

## COMMERCIAL IMPORTANCE

The Basking Shark was historically hunted for its liver oil and to a lesser extent its meat and fins. It is still sought for its large fins which are extremely valuable in the Asian fin trade. Traditionally its liver oil was processed for vitamin A, tanning leather and as lamp oil. It is still processed for its squalene which is used for medicinal and cosmetic purposes. In addition, the skin can be used for leather, the cartilage for medicinal use and the carcass can be processed into fishmeal (Compagno, 2001).

## THREATS, CONSERVATION, LEGISLATION

In the United Kingdom, the Basking Shark was first protected around the Isle of Man and later around Guernsey. In April 1998, it was listed on the Wildlife and Countryside Act (1981) and completely protected in British waters out to the 12 mile limit (Defra, 2007). A UK Biodiversity Action Plan for this species was implemented in 1999 (JNCC, 2007).

In the Mediterranean, the Basking Shark was protected in Maltese waters in 1999. It is listed on Annex II (as an Endangered or Threatened species) of the Protocol of the Barcelona Convention for the Protection of the Mediterranean Sea, and on Appendix II of the Bern Convention on Conservation of European Wildlife and Natural Habitats.

In the USA, the Basking Shark is fully protected from fisheries in Florida state waters and in Federal US Atlantic and Gulf waters by the US Marine Fisheries Service (Shark Trust, 2007). The Shark Finning Act (HR 5461) prohibits the landing or possession of fins without the entire shark carcass and since 1997 fishermen are prohibited from keeping 19 species of shark, including the Basking Shark. In New Zealand, the Basking Shark has some protection; targeted fishing is illegal, but sharks taken as bycatch may be landed (Shark Trust, 2007).

Since 2007, the EU has prohibited fishing for, retaining on board, transshipping or landing the Basking Shark by any vessel in EU waters or by an EU vessel anywhere. Norway has also banned directed fisheries for Basking Sharks and any live specimens taken as bycatch must be released. However dead and dying sharks caught as bycatch can still be landed and sold, severely limiting the effectiveness of the ban (CPOA Shark, 2009).

The Basking Shark is listed in Appendix II of the Convention on International Trade in Endangered Species (CITES), Annex B of the EU Wildlife Trade Regulation (No. 338/97) and it is also covered by the Convention on Migratory Species (CMS). Since 2004, it has been included in the Convention on the Protection of the Marine Environment of the North-East Atlantic (OSPAR) list of threatened and/or declining species (CPOA Shark, 2009).

## IUCN RED LIST ASSESSMENT

Vulnerable (2000).

Endangered in northeast Atlantic.

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Enormous, powerful shark.
- Abrasive skin.

### REFERENCES

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Text: Richard Hurst.  
Illustrations: Marc Dando.

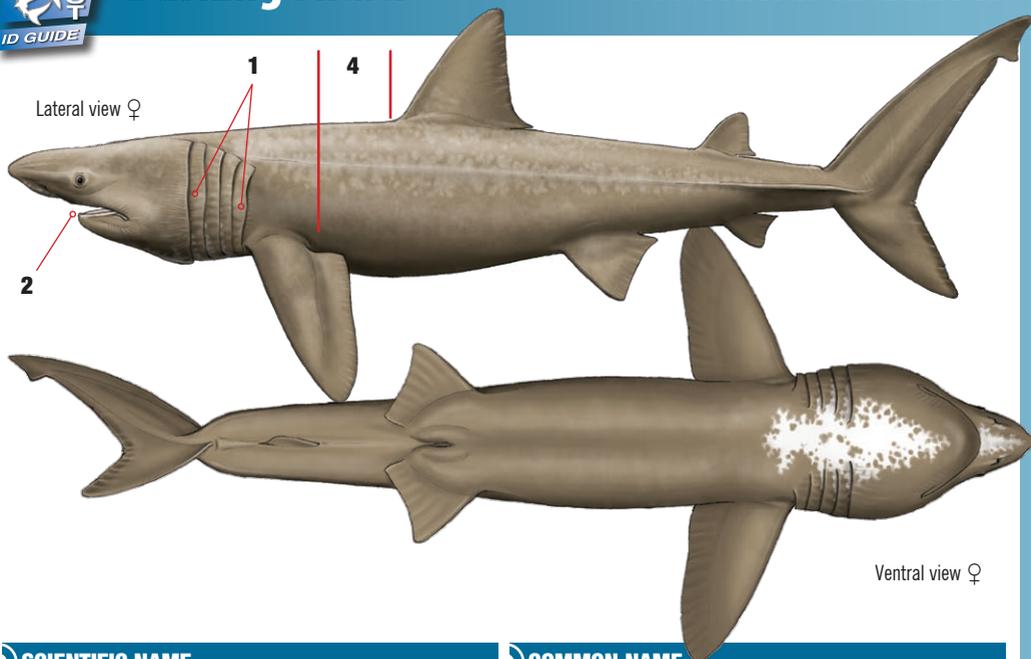
#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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### SCIENTIFIC NAME

*Cetorhinus maximus* (Gunnerus, 1765).

### DISTRIBUTION

Found worldwide in temperate seas. Known in the East Atlantic from Russia to Senegal, including the Mediterranean Sea, and from Namibia to South Africa<sup>i</sup>.



### COMMON NAME

**BASKING SHARK**, Bone Shark, Elephant Shark, Hoe-Mother, Pélerin (Fr), Peregrino (Es).

### IDENTIFICATION

- 1 Large gill slits almost encircle head.
- 2 Huge subterminal mouth.
- 3 Dermal denticle gillrakers.
- 4 Origin of first dorsal fin behind pectoral fin bases<sup>i</sup>.

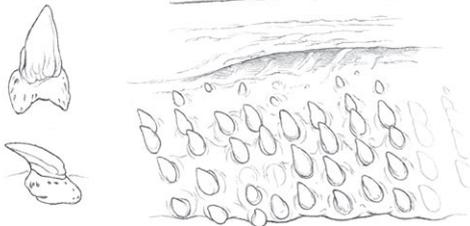
### COLOUR

- Grey, grey/brown, blue/grey to blackish dorsally.
- Similar though sometimes lighter ventrally.
- Often irregular white blotches ventrally.
- Sometimes lighter stripes and spots on flanks<sup>vi</sup>.

### BIOLOGY AND SIZE

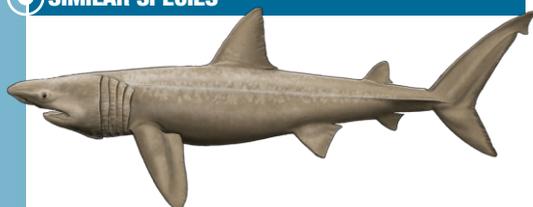
- Birth: 100–170cm. Mature: 460–610cm ♂<sup>vii</sup>. Max TL: 1220cm<sup>i</sup>.
- Passive filter-feeding planktivore, feeding on copepods, crustacean larvae and the eggs and larvae of fishes<sup>i</sup>.
- Gestation period unknown but estimated from 1–3.5 years<sup>iii,vi</sup>.
- Size at birth unknown but believed to be 100–170cm<sup>vii</sup>.

## TEETH

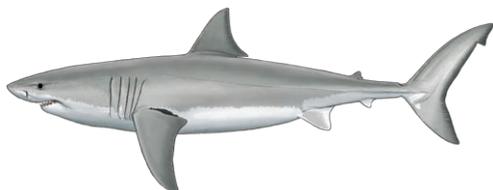


- Tiny hooked teeth.
- Wide space on centre of upper jaw with only scattered teeth<sup>vi</sup>.

## SIMILAR SPECIES



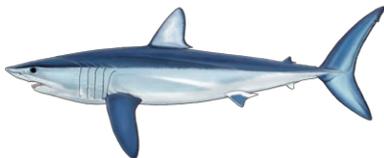
- *Cetorhinus maximus*, **Basking Shark**



- *Carcharodon carcharias*, **White Shark**



- *Lamna nasus*, **Porbeagle Shark**



- *Isurus oxyrinchus*, **Shortfin Mako Shark**



- *Isurus paucus*, **Longfin Mako Shark**

## HABITAT

- From the surface to 1,264m<sup>iv</sup>.
- Prefers water 8–14°C across much of its range but has been recorded from 24°C water off New England.
- Common in inshore waters during the summer, almost to the surf line.
- Prefer ocean fronts around headlands, islands and in enclosed areas with strong tidal flows<sup>i</sup>.
- Undertakes trans-oceanic movements<sup>iv</sup>.

## CONSERVATION STATUS

- Protected throughout EU waters since 2007. Covered by a number of other instruments including CITES, CMS<sup>viii</sup>, UK WCA (1981)<sup>vi</sup>, UK BAP<sup>v</sup>, the Barcelona Convention, the Bern Convention and the OSPAR Convention<sup>vi</sup>.
- **Red List status:** Vulnerable (2000). Endangered in the Northeast Atlantic.

## COMMERCIAL IMPORTANCE

- Historically hunted using harpoons and nets.
- Liver oil previously used for vitamin A, tanning leather and lamp oil. Currently processed for squalene used in cosmetics and medicines.
- Fins are extremely valuable in the Asian fin trade due to their large size and high quality<sup>i</sup>.
- Prohibition on commercial fishers retaining this species in all ICES areas.

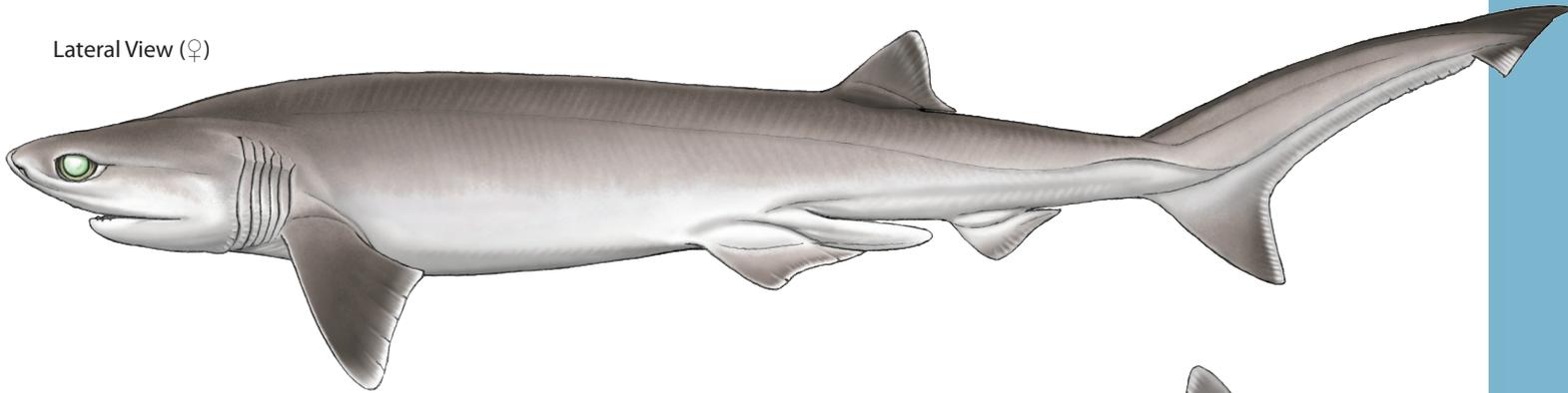
## HANDLING

- Handle with care.
- Enormous, powerful shark.
- Abrasive skin.

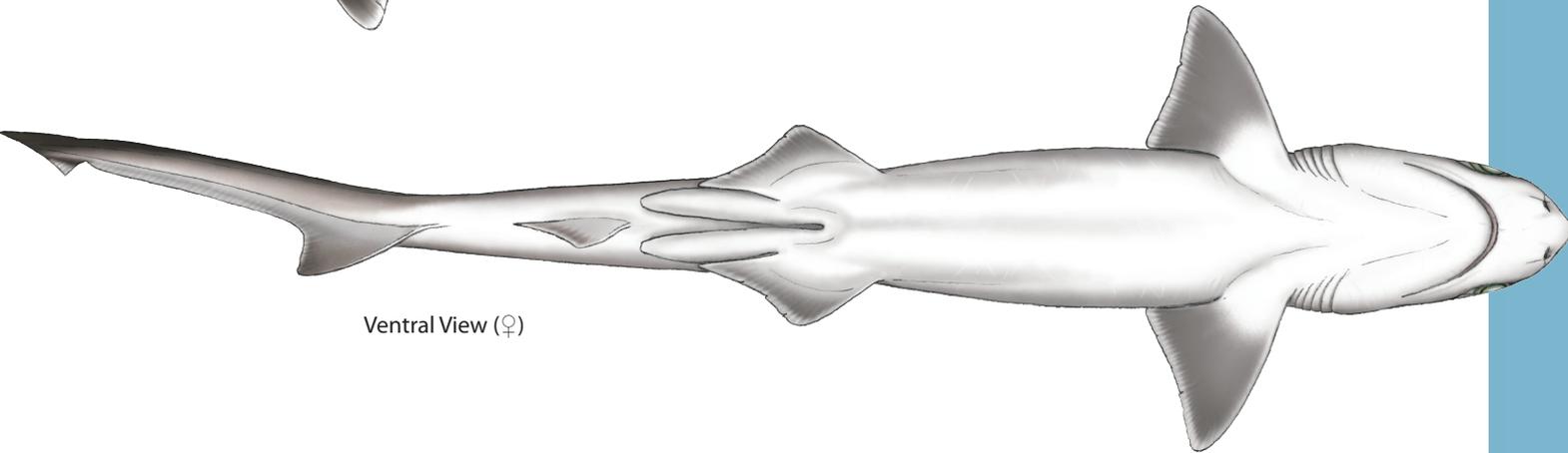
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- ii. DEFRA; 2007.
- iii. Fowler, S. L.; 2000. IUCN Red List.
- iv. Gore, M. A. *et al*; 2008. *Biol. Lett.* doi.
- v. JNCC; 2007.
- vi. Knickle, C. *et al*; Unknown. FLMNH.
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- viii. Shark Trust; 2005.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Bigeye Sixgill Shark**, Requin Vache (Fr), Cañabota Ojigrande (Es).

### SYNONYMS

*Hexanchus vitulus* (Springer & Waller, 1969), *Hexanchus griseus nakamurai* (Teng, 1962).

### DISTRIBUTION



The Bigeye Sixgill Shark is widely distributed in the deep waters of the Atlantic, Indian and western Pacific Oceans. In the east Atlantic it is found from France to Morocco and possibly the Ivory Coast and Nigeria (Bester, Unknown). It is known from the Mediterranean Sea, most commonly the west but into the Aegean Sea and towards the east (Megalofonou *et al.*, 2005).

### APPEARANCE

- 180cm maximum total length.
- Narrow head with six gills.
- Slender body.
- Single rear-set dorsal fin.
- Nine teeth on each side of the upper jaw.
- Five comb-like teeth each side of a symphyseal tooth in the lower jaw.
- Light or dark brown-grey dorsally.
- Lighter to white ventrally.
- Trailing edges of fins white.
- Juveniles have black tipped upper caudal fin. (Bester, C; Unknown)

The Bigeye Sixgill Shark is similar to the Bluntnose Sixgill Shark, *Hexanchus griseus*, but the head is less broad and the snout is longer and pointed. The eyes are large and there are six gill slits. There is a single, spineless dorsal fin set behind the pelvic fins and usually before the anal fin base. The pectoral fins have a concave posterior margin. The dorsal lobe of the caudal fin is long and there is a distinct ventral lobe (Compagno, 1984). The dorsal colouration is a plain dark or light grey, paling to lighter ventrally. The trailing edges of the fins have white margins. Juveniles have a black tipped upper caudal fin. Live animals have green eyes. The maximum total length is 180cm (Bester, Unknown).

## SIMILAR SPECIES

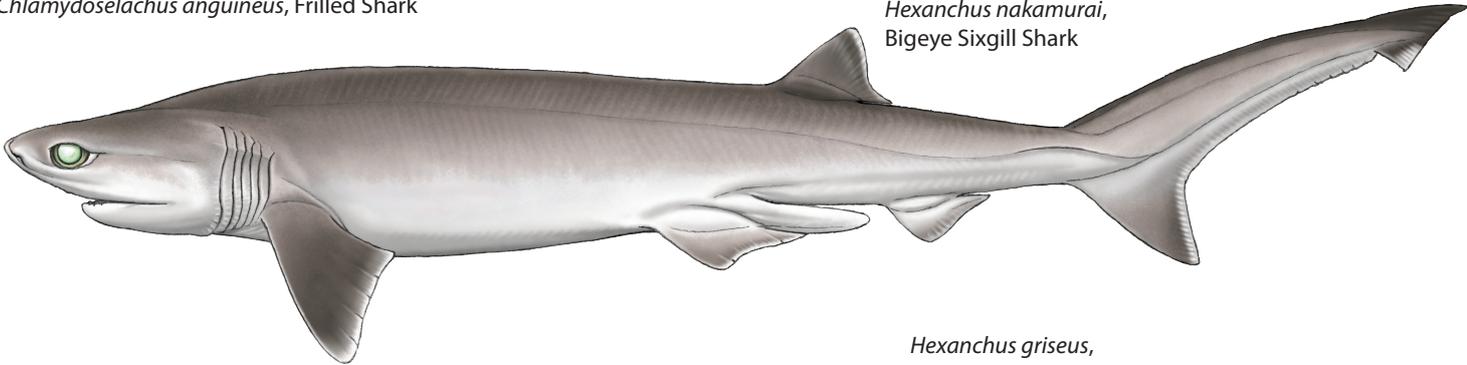
*Hexanchus griseus*, Bluntnose Sixgill Shark

*Heptranchias perlo*, Sharpnose Sevengill Shark

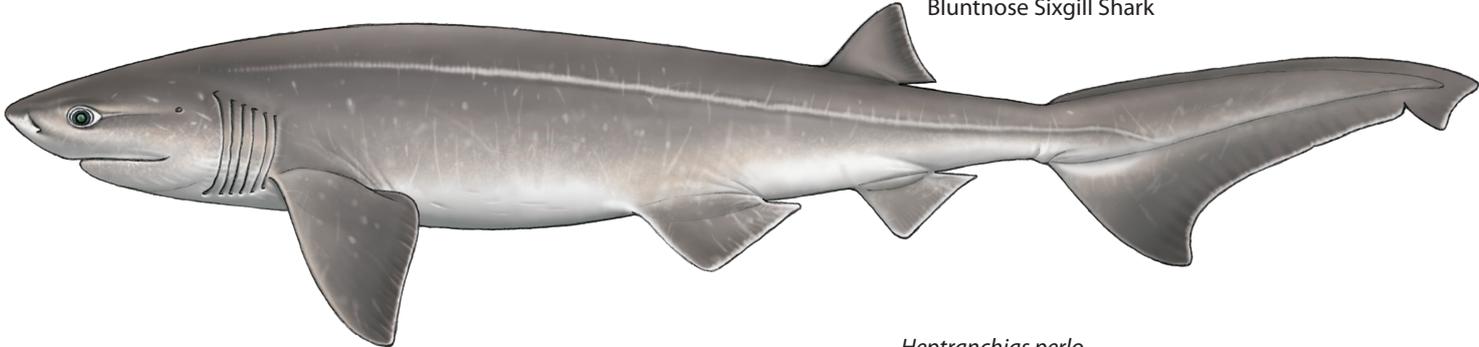
*Somniosus microcephalus*, Greenland Shark

*Chlamydoselachus anguineus*, Frilled Shark

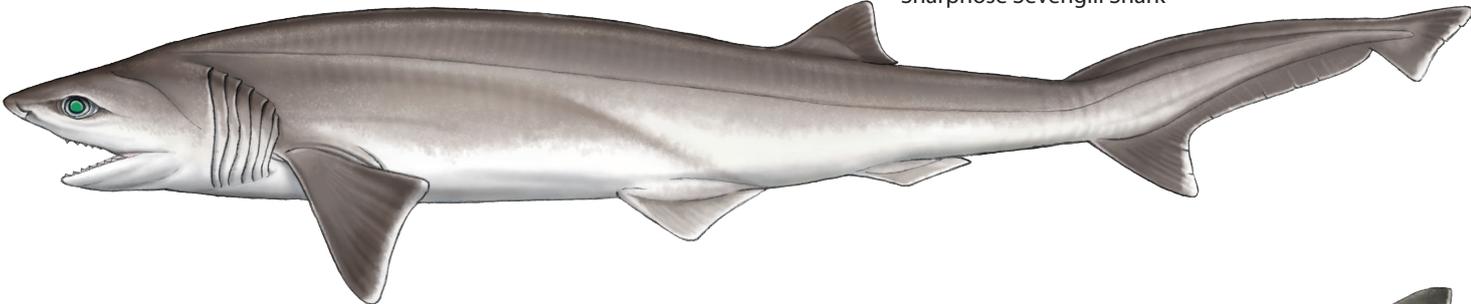
*Hexanchus nakamurai*,  
Bigeye Sixgill Shark



*Hexanchus griseus*,  
Bluntnose Sixgill Shark



*Heptranchias perlo*,  
Sharpnose Sevengill Shark



*Somniosus microcephalus*,  
Greenland Shark



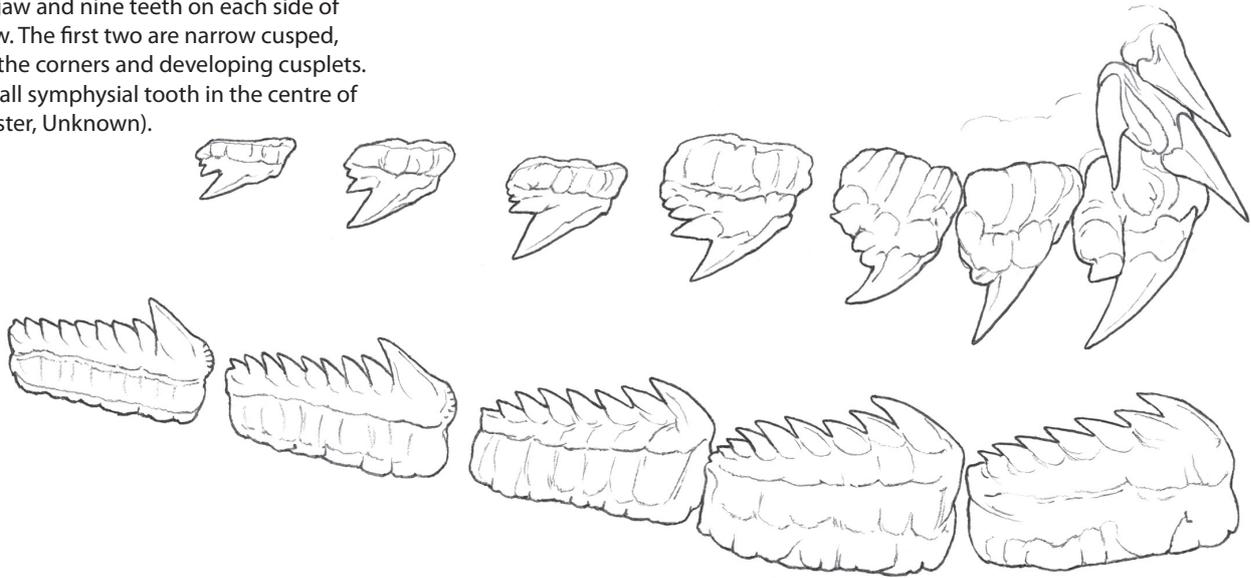
*Chlamydoselachus anguineus*,  
Frilled Shark



(Not to scale)

### TEETH

There are five large, comb-like teeth on each side of the lower jaw and nine teeth on each side of the upper jaw. The first two are narrow cusped, widening to the corners and developing cusplets. There is a small symphyseal tooth in the centre of each jaw (Bester, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Bluntnose Sixgill Shark is found on continental and insular slopes from 90–621m with possible excursions to the surface in the tropics (Gibson *et al.*, 2006; Compagno, 1984).

#### EGGCASE

N/A

### DIET

Little is known of the diet of the Bluntnose Sixgill Shark but it presumably feeds on a variety of bony fish and benthic invertebrates. A small tuna has been reported from stomach contents suggesting that it feeds near the surface (Bester, Unknown).

### REPRODUCTION

The Bluntnose Sixgill Shark is an ovoviparous species. Females mature around 142–178cm, males around 123–157cm. Litters of up to 13 pups, each measuring around 43cm, are born after an unknown gestation period (Compagno, 1984).

## COMMERCIAL IMPORTANCE

The Bluntnose Sixgill Shark is uncommonly taken by bottom trawl and longline gear but of relatively small importance to fisheries (Gibson *et al.*, 2006). The fins, hide, liver oil and flesh are presumably utilised if the animal is landed.

## THREATS, CONSERVATION, LEGISLATION

Due to its patchy distribution, apparently low abundance and confusion with the Bluntnose Sixgill Shark, *Hexanchus griseus*, nothing is known of the population trends of the Bigeye Sixgill Shark. Species-specific catch data is required to better assess the threats to the species (Gibson *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Data Deficient (2008).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

### REFERENCES

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Illustrations: Marc Dando.

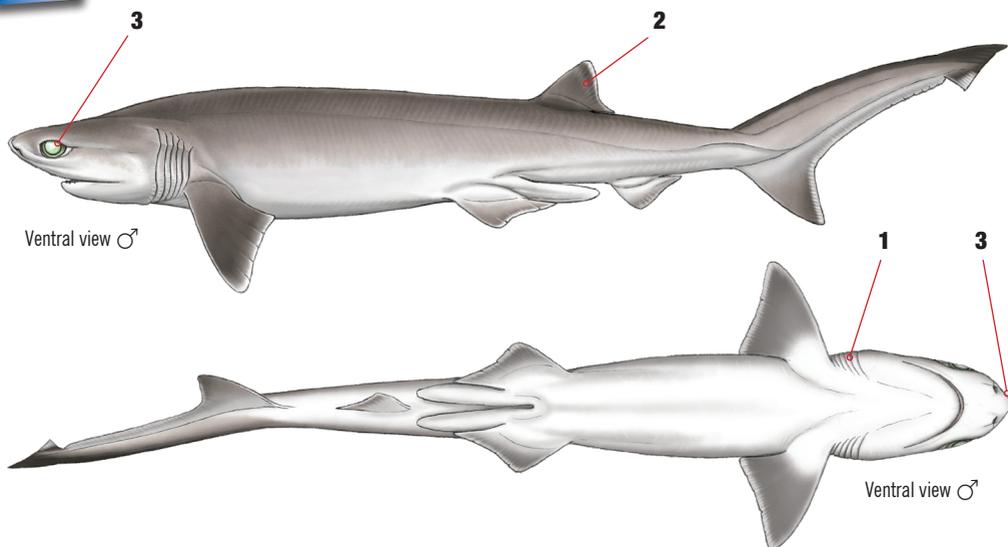
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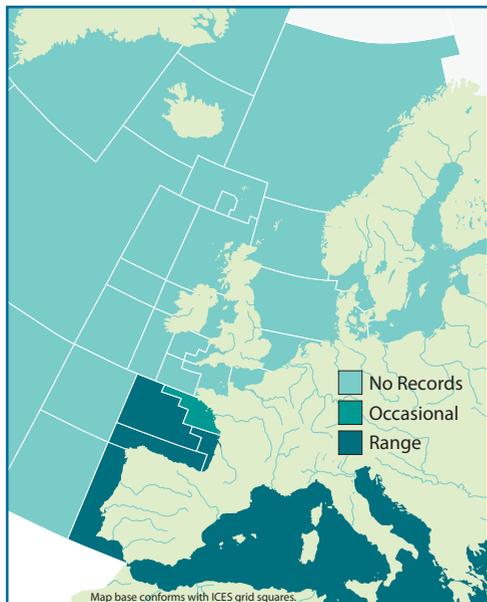


## SCIENTIFIC NAME

*Hexanchus nakamurai* (Teng, 1962).

## DISTRIBUTION

Wide but patchy distribution in warm temperate and tropical waters. East Atlantic from France to Morocco, including the Mediterranean Sea. Possibly Ivory Coast and Nigeria<sup>i</sup>.



## COMMON NAME

**BIGEYE SIXGILL SHARK**, Requin Vache (Fr), Cažabota Ojigrande (Es).

## IDENTIFICATION

- 1 Six gill slits.
- 2 Single dorsal fin behind pectoral fins.
- 3 Pointed snout and conspicuously large eyes<sup>ii</sup>.

## COLOUR

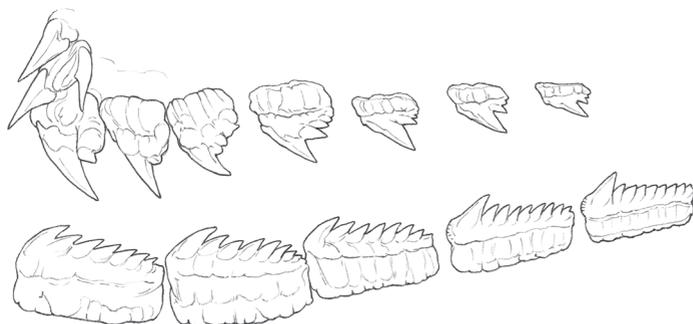
- Dark to light brown/grey dorsally.
- Lighter to white ventrally.
- Trailing edges of fins have white margins.
- Black-tipped dorsal caudal lobe in juveniles<sup>ii</sup>.

## BIOLOGY AND SIZE

- Born: 43cm. Mature: 142–178cm ♀, 123–157cm ♂. Max TL: 180cm<sup>ii</sup>.
- Ovoviviparous species giving birth to 13–26 young per litter.
- Diet poorly understood but feeds on a wide variety of fishes and bottom dwelling invertebrates<sup>ii</sup>.
- A small tuna has been reported from stomach contents indicating scavenging<sup>g</sup>.



## TEETH



- 5 large comb-like teeth on each side of lower jaw.
- 9 teeth on each side of upper jaw, first 2 narrow cusped, wider to corners developing cusplets.
- Small symphyseal tooth in centre of each jaw<sup>i</sup>.

## SIMILAR SPECIES



- Hexanchus nakamurai*, Bigeye Sixgill Shark



- Heptanchias perlo*, Sharpnose Sevengill Shark



- Hexanchus griseus*, Bluntnose Sixgill Shark



- Somniosus microcephalus*, Greenland Shark



- Chlamydoselachus anguineus*, Fritled Shark

## HABITAT

- Continental and insular shelves and slopes from 90–600m.
- Usually found on or near the bottom but occasionally at the surface in the tropics<sup>ii</sup>.

## CONSERVATION STATUS

- Little known shark commonly confused with the Bluntnose Sixgill Shark, *Hexanchus griseus*, leading to a lack of information on biology, distribution and population trends<sup>iii</sup>.
- Red List status:** Data Deficient (2008).

## COMMERCIAL IMPORTANCE

- Uncommonly taken on longlines and in trawls.
- Of limited interest to fisheries although its flesh, liver and fins may be utilised<sup>iii</sup>.

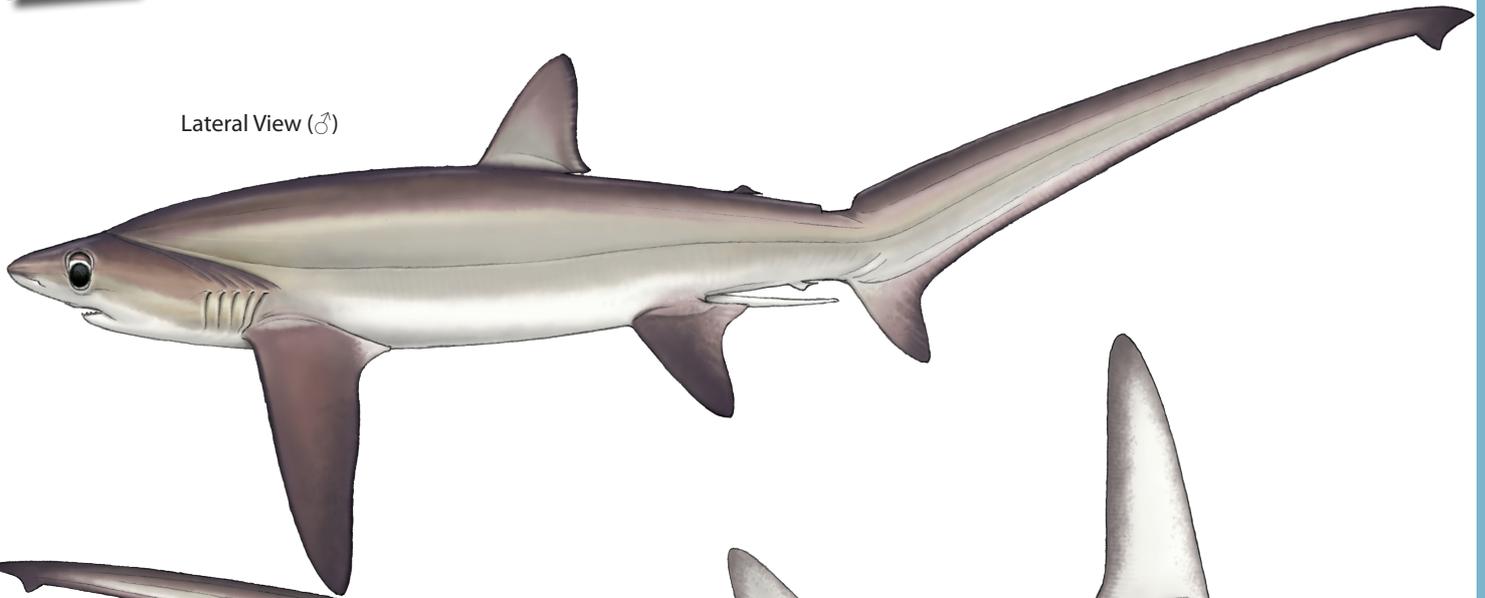
## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

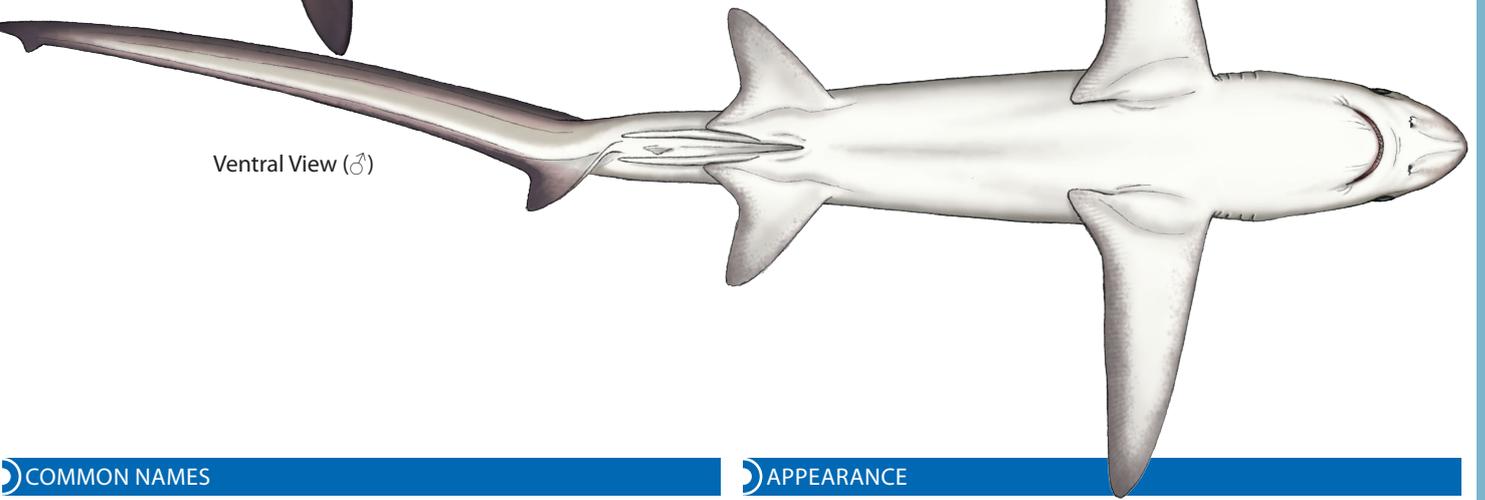
## REFERENCES

- Bester, C; Unknown. FLMNH.
- Compagno, L. J. V; 1984. FAO.
- Gibson, C. *et al*; 2006. IUCN Red List.

Lateral View (♂)



Ventral View (♂)



### COMMON NAMES

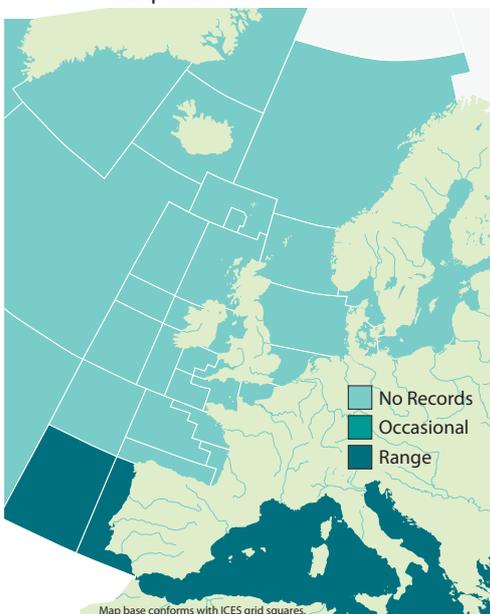
**Bigeye Thresher Shark**, Thresher Shark, Fox Shark, Long-tailed Shark, Whiptail Shark, Renard à Gros Veux (Fr), Zorro Ojón (Es).

### SYNONYMS

*Alopias profundus* (Nakamura, 1935), *Alopias superciliosus* (Lowe, 1841).

### DISTRIBUTION

The Bigeye Thresher Shark is found almost circumglobally in tropical and warm temperate waters. In the east Atlantic it can be found from Portugal to Angola, including the western Mediterranean Sea. In the west Atlantic it is found from New York to Florida, USA, the Bahamas, Cuba, Venezuela and southern Brazil. It can also be found in South Africa, Madagascar, the Arabian Sea, southern Japan, Taiwan, New Caledonia, Australia, New Zealand, Hawaii, southern California and the Galapagos Islands (Compagno, 2001).



### APPEARANCE

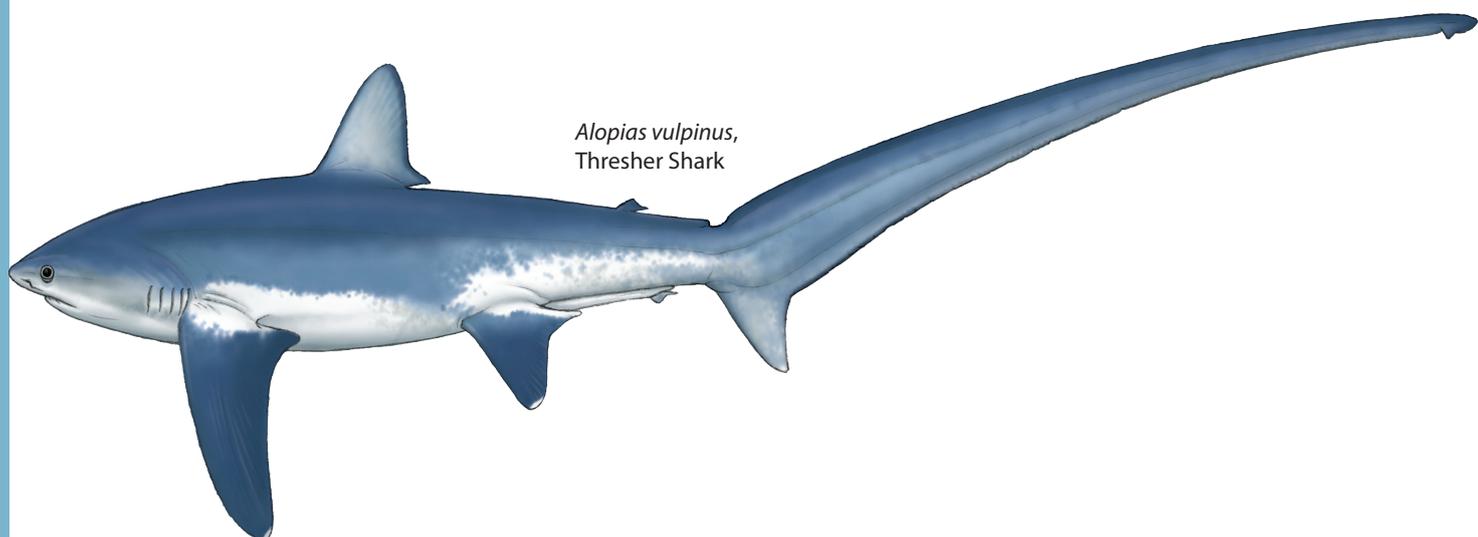
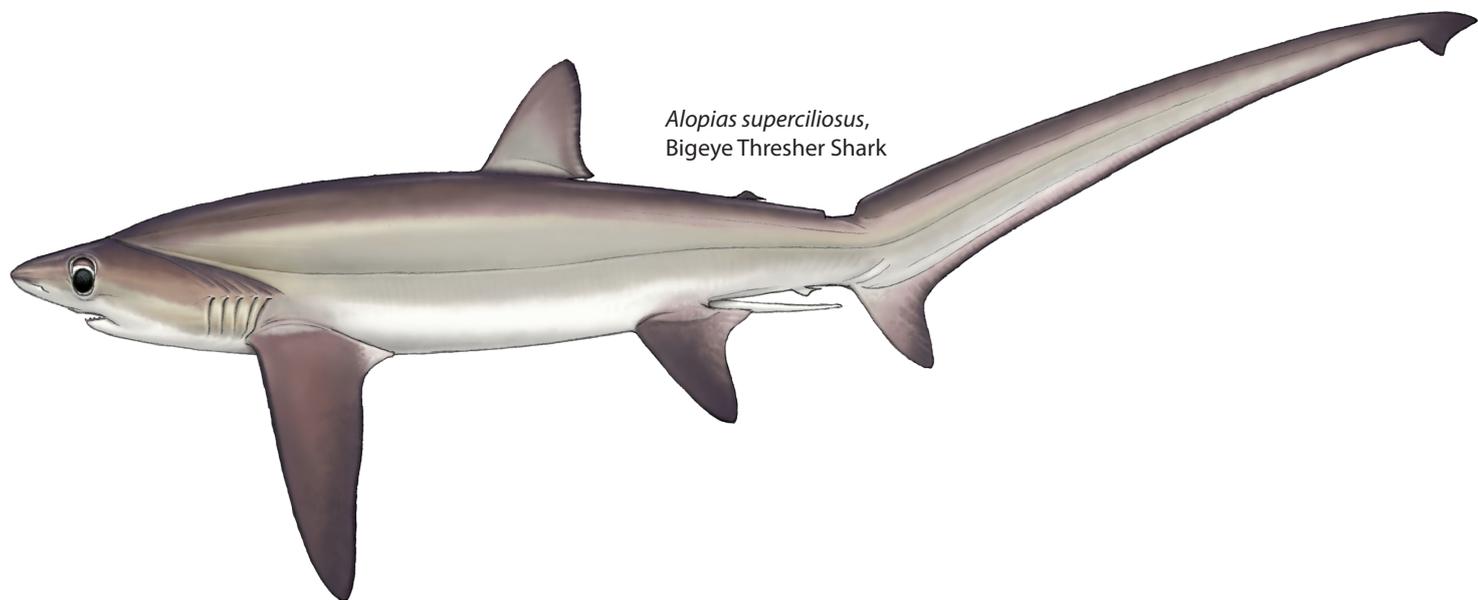
- Long dorsal caudal lobe, nearly as long as rest of shark.
- Obvious notches on head.
- Huge, vertically expanded eyes extend onto top of head.
- Broad tipped pectoral fins.
- Slender, smooth-edged teeth. 19–24 uppers, 20–24 lowers.
- Purplish grey to brown grey dorsally with metallic hues.
- Solid creamy white ventrally.

The Bigeye Thresher Shark is a distinctive shark with an extremely long dorsal caudal lobe. It is distinguishable from the other two species in the genus by its large eyes, which extend onto the upper surface of the head, and the strong notches which run laterally from behind the eyes to behind the gills. The pectoral fins are large and falcate. The first dorsal fin is set well back, the free rear tip of which reaches the origin of the pelvic fins. The pelvic fins are relatively large and the second dorsal and anal fins are tiny (Compagno, 2001).

When dead, the Bigeye Thresher Shark is dark grey above, paler below. Freshly caught or live specimens are deep purple on the back, fading to grey violet on the flanks and a pale cream color on the undersurfaces (Martin, Unknown).

## SIMILAR SPECIES

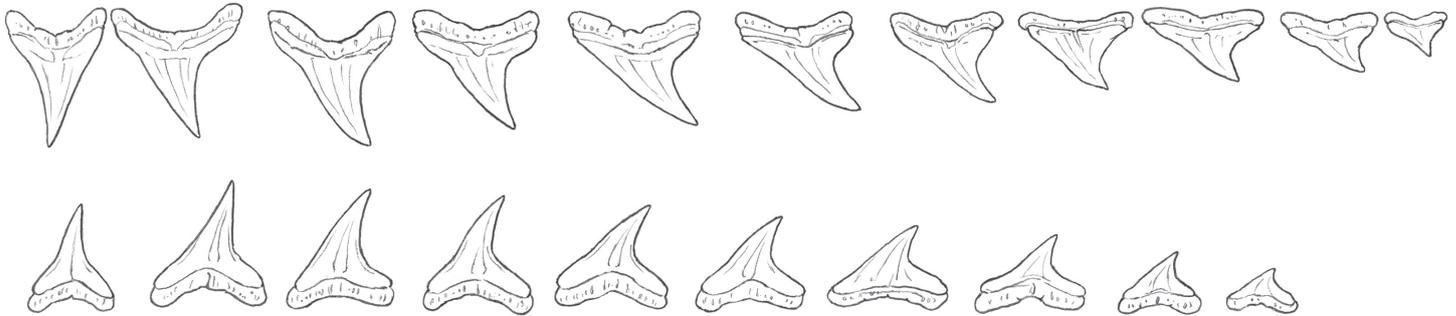
*Alopias vulpinus*, Thresher Shark



(Not to scale)

### TEETH

Slender, smooth-edged teeth in both jaws. 19–24 uppers, 20–24 lowers (Jensen, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

A pelagic species, the Bigeye Thresher Shark can be found from the surface to at least 500m in warm temperate and tropical oceans worldwide, preferring surface sea temperatures of 16–25°C. It has been known to enter shallow, coastal waters but this behaviour is reportedly not common (Compagno, 2001; Jensen, Unknown).

Like other Lamniformes, the Bigeye Thresher Shark has a 'rete mirabile' system that allows it to maintain its body temperature above that of the surrounding water (Martin, 1992). This is a rare trait among fishes, only the mackerel sharks (Lamnidae), tunas (Thunnini) and billfishes (Xiphiidae, Istiophoridae) having evolved the ability. This system is particularly well developed around the eyes and brain, possibly allowing the shark to forage below the thermocline for extended periods of time without any detriment to the sensory systems (Weng and Block, 2004).

Tagging studies have shown that the Bigeye Thresher Shark is capable of travelling large distances with the longest recorded to date being 2,767km between New York and the eastern Gulf of Mexico. This represents the straight line distance between the tag point and the recapture point and the actual distance travelled is likely to be considerably further (Kohler and Turner, 2001).

Diel migrations have also been recorded in the eastern Pacific with tagged sharks remaining between 200–500m in water temperatures of 6–12°C during the daytime. At night they moved to shallower water, 10–100m in temperatures of 20–26°C (Weng and Block, 2004).

#### DIET

The Bigeye Thresher Shark feeds predominantly on hake, squid, scombrids, alepisaurids, clupeids, istiophorids and elasmobranchs (Smith *et al.*, 2008). The elongated dorsal caudal lobe is apparently used to stun and disorient prey and it has been recorded tail-hooked on pelagic longlines, presumably after attempting to stun the bait prior to feeding (Compagno, 2001).

The large eyes set high in the head are possibly adapted to allow it to hunt for prey silhouetted against the surface. Tracked individuals in the eastern Pacific have exhibited night time swimming patterns of slow ascents followed by rapid descents, consistent with the predicted behaviour of an animal searching for prey above it (Smith *et al.*, 2008).

#### REPRODUCTION

Female Bigeye Thresher Sharks mature at a total length of 332–341cm, which corresponds to an age of 12.3–13.4 years. Males mature smaller at a total length of 270–288cm, corresponding to an age of 9–10 years. The reproductive mode is aplacental ovoviviparous, meaning embryos are enclosed in a membranous capsule during early gestation. After they emerge from this capsule they are nourished by a supply of unfertilised eggs, termed oophagy. Two pups are usually born (one from each uterus) but up to four have been recorded. Size at birth varies considerably, although the average is 145–149cm. No free swimming individuals smaller than 100cm total length have been reported (Smith *et al.*, 2008).

## COMMERCIAL IMPORTANCE

Depending on locality, the Bigeye Thresher Shark can be considered an important species or a nuisance. It is targeted and taken as bycatch in longline, gillnet and trawl fisheries, as well as by recreational anglers to a lesser extent. The flesh is not greatly appreciated for human consumption but it is consumed fresh, smoked, dried or salted. In addition, the fins are valuable in the Asian fin trade and the skin can be utilised for leather (Jensen, Unknown).

## THREATS, CONSERVATION, LEGISLATION

The Bigeye Thresher Shark has an exceptionally low fecundity and a low annual population increase rate making it highly vulnerable to fishing pressure. Gillnet and longline fisheries operate, largely unmanaged, across much of its range and many large, pelagic sharks are presumably taken as bycatch. Catch rates of thresher sharks as a group have significantly reduced in the northwest Atlantic and eastern Pacific and declines are suspected in other areas (Gibson *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Vulnerable (2008).

## HANDLING

- Handle with care.
- Long tail extremely dangerous when hooked.
- Sharp teeth and abrasive skin.

### REFERENCES

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Text: Richard Hurst.  
Illustrations: Marc Dando.

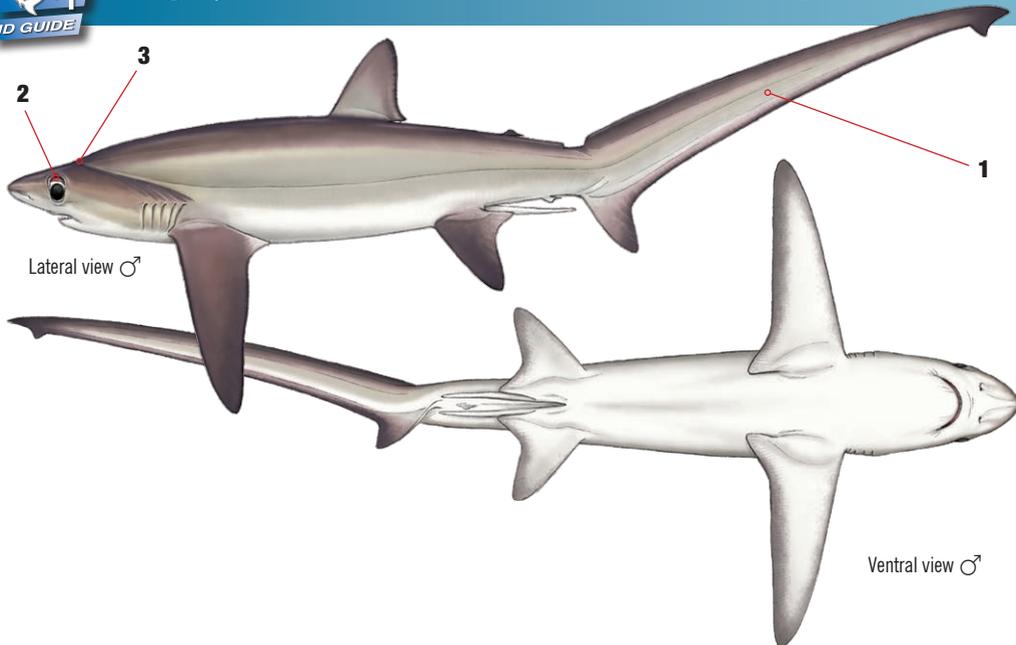
#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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Lateral view ♂

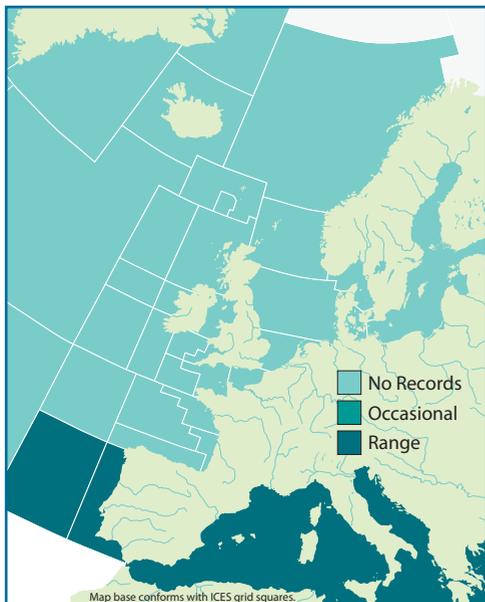
Ventral view ♂

## SCIENTIFIC NAME

*Alopias superciliosus* (Lowe, 1839).

## DISTRIBUTION

Circumglobal in tropical and warm temperate waters. East Atlantic from Portugal to Angola including the western Mediterranean Sea<sup>1</sup>.



## COMMON NAME

**BIGEYE THRESHER SHARK**, Thresher Shark, Fox Shark, Long-tailed Shark, Whiptail Shark, Renard à Gros Veux (Fr), Zorro Ojón (Es).

## IDENTIFICATION

- 1 Dorsal caudal lobe nearly as long as rest of body.
- 2 Huge eyes extend onto dorsal surface.
- 3 Deep, horizontal grooves above gills<sup>1</sup>.

## COLOUR

- Purple to brown grey dorsally.
- Metallic hues on back and flanks.
- Creamy white ventrally<sup>iii</sup>.

## BIOLOGY AND SIZE

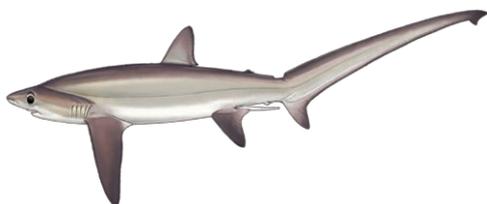
- Born: 100–140cm. Mature: 300–350cm ♀, ~300cm ♂. Max TL: >460cm<sup>1</sup>.
- Litters small, maximum of four but usually two, one from each uterus<sup>4</sup>.
- Feeds on a variety of teleost fish, cephalopods and elasmobranchs<sup>4</sup>. Uses its elongated tail to stun prey<sup>1</sup>.
- Can maintain its body temperature above that of the surrounding water allowing it to range into temperate regions<sup>vi</sup>.

## TEETH

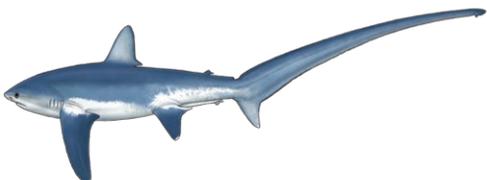


- Slender and smooth edged.
- 19–24 upper teeth.
- 20–24 lower teeth<sup>iii</sup>.

## SIMILAR SPECIES



- Alopias superciliosus*, **Bigeye Thresher Shark**



- Alopias vulpinus*, **Thresher Shark**

## HABITAT

- Surface to 500m, mostly > 100m<sup>i</sup>. Prefers surface temperatures of 16–25°C<sup>iii</sup>.
- Straight line migrations of up to 2,767km have been recorded by tagging studies<sup>iv</sup>.
- Large, upward looking eyes possibly used to search for prey silhouetted against the surface of the water<sup>v</sup>.

## CONSERVATION STATUS

- Little known but exceptionally low fecundity and low abundance make it particularly vulnerable to fishing pressure<sup>ii</sup>.
- Red List status:** Vulnerable (2008).

## COMMERCIAL IMPORTANCE

- Targeted in some places, considered a nuisance in others.
- Taken on longlines, in gillnets and in pelagic trawls.
- Very valuable fins, skin and liver used for leather and oil. Meat is not highly appreciated but is sometimes consumed<sup>iii</sup>.
- 2010 – Prohibition on commercial fishers retaining this species in the ICCAT convention area.

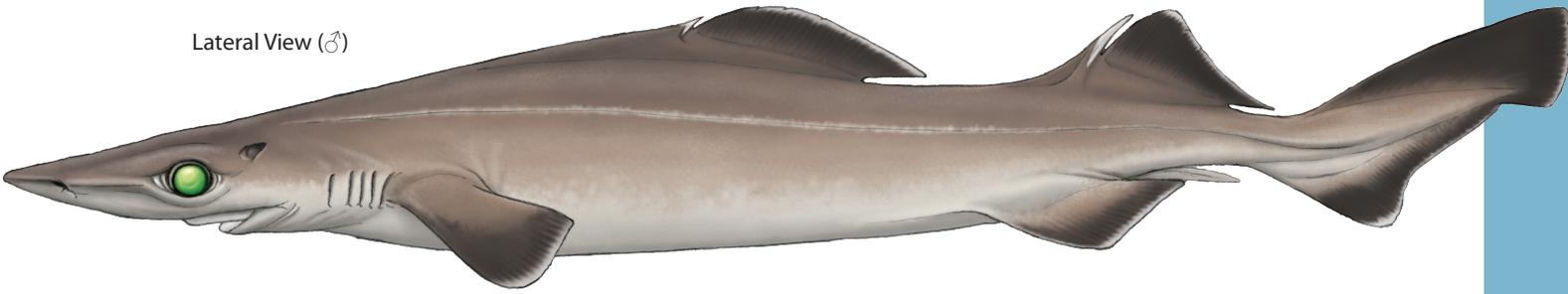
## HANDLING

- Handle with care.
- Long tail extremely dangerous when hooked.
- Sharp teeth and abrasive skin.

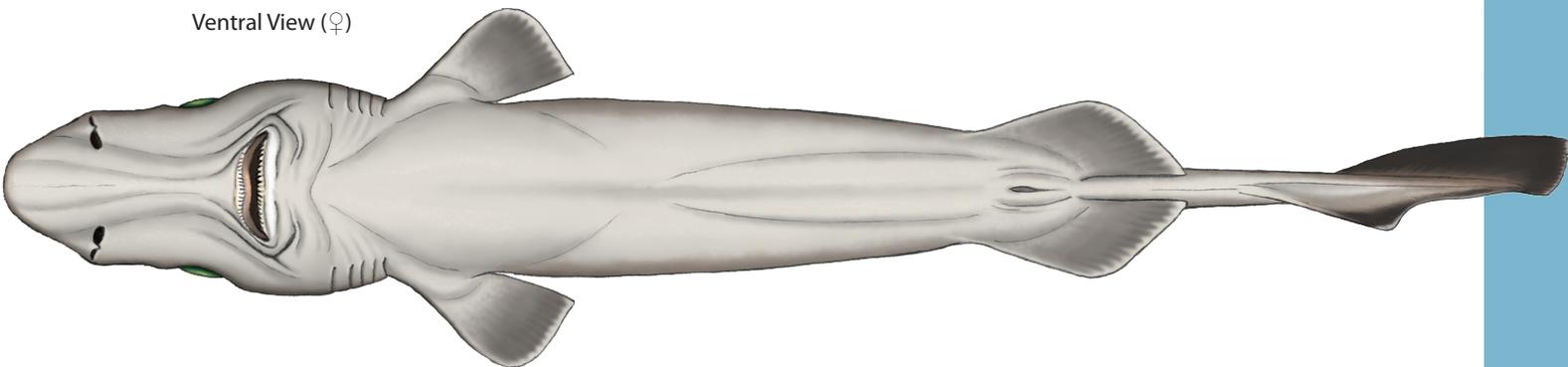
## REFERENCES

- Compagno, L. J. V. *et al*; 2005. HarperCollins Publishers.
- Gibson, C. *et al*; 2006. IUCN Red List.
- Jensen, C; Unknown. FLMNH.
- Kohler, N. E. *et al*; 2001. *Environ. Biol. Fishes*.
- Smith, S. E. *et al*; 2008. Blackwell Publishing.
- Weng, K. C. *et al*; 2004. *Fish. Bull.*

Lateral View (♂)



Ventral View (♀)



### COMMON NAMES

**Birdbeak Dogfish**, Brier Shark, Shovelnose Spiny Dogfish, Squale Savate (Fr), Tollo Pajarito (Es).

### SYNONYMS

*Acanthidium calceum* (Lowe, 1839), *Centrophorus crepidalbus* (Bocage & Capello, 1868), *Deania eglantina* (Jordan & Snyder, 1902), *Acanthidium rostratum* (Garman, 1906), *Acanthidium aciculatum* (Garman, 1906), *Centrophorus kaikourae* (Whitley, 1934).

### DISTRIBUTION



The Birdbeak Dogfish is known in the east Atlantic from Iceland along the Atlantic slope to the Faroe Islands, Madeira, Mauritania, possibly Senegal and Namibia. It is also known from areas of the Indian and Pacific Oceans (Compagno, 1984).

### APPEARANCE

- Extremely long snout.
- First dorsal fin with small, grooved spine.
- Second dorsal spine is grooved and much larger.
- First dorsal fin long and low, second more upright.
- No anal fin.
- Large subterminal lobe on caudal fin.
- Teeth similar in both jaws.
- Uniformly grey brown.
- To 111 cm total length.

The Birdbeak Dogfish is a slender shark with an extremely long snout. The first dorsal fin is long and low with an expanded forward ridge. This ridge originates over the pectoral base. The second dorsal fin is more upright and the ridge originates over the pelvic base. Both dorsal fins have associated spines, although the second is much larger than the first. There is no anal fin. The dorsal lobe of the caudal fin is larger than the ventral lobe. There is a large subterminal lobe but no terminal notch. The dermal denticles are small (~0.5mm crown length) and pitchfork shaped. The colouration is a uniform grey brown with no pattern (Compagno, 1984).



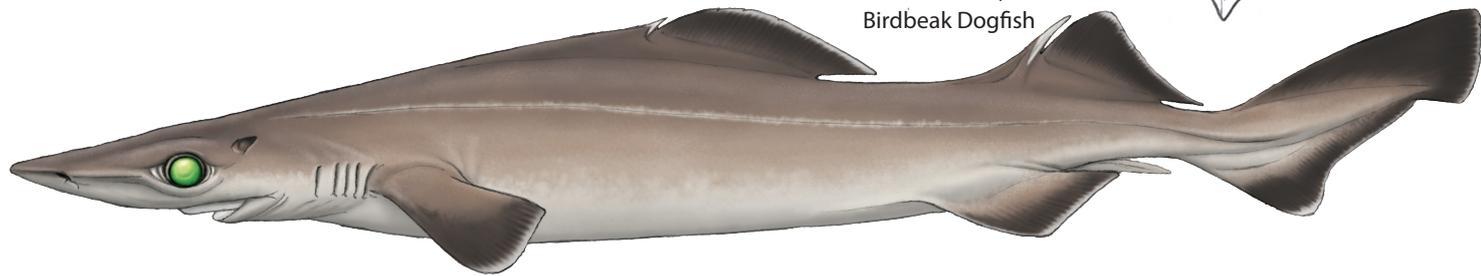
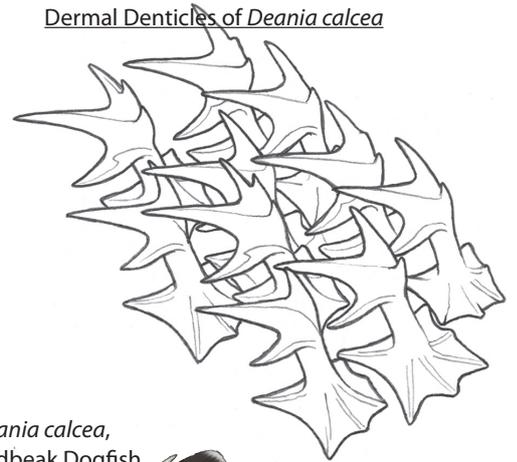
## SIMILAR SPECIES

*Deania profundorum*, Arrowhead Dogfish

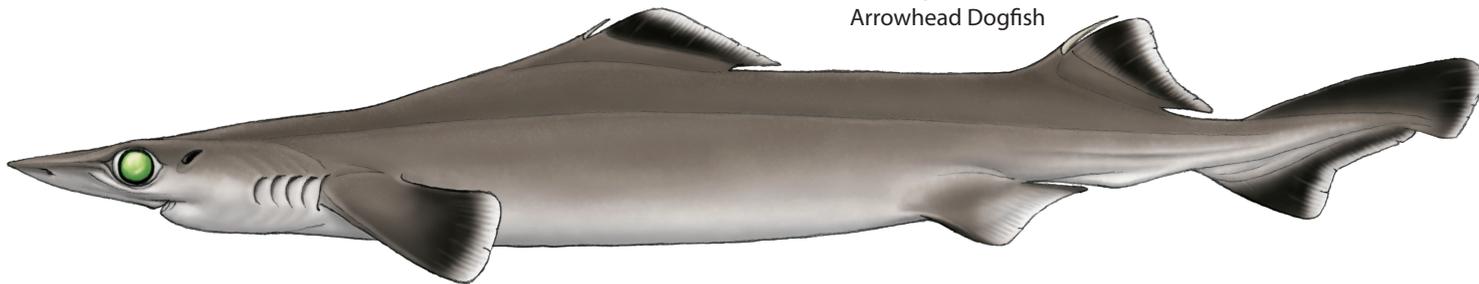
*Deania hystricosa*, Rough Longnose Dogfish

*Centroselachus crepidater*, Longnose Velvet Dogfish

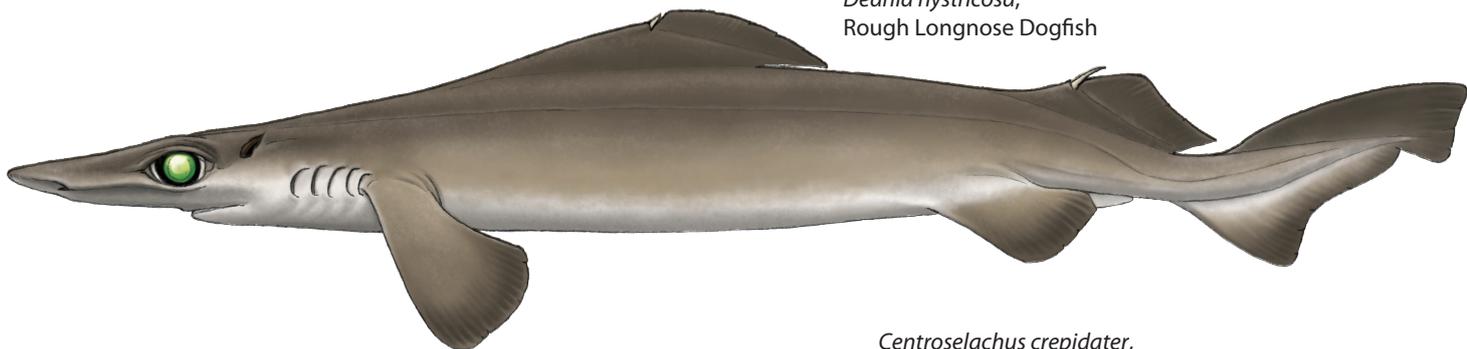
Dermal Denticles of *Deania calcea*



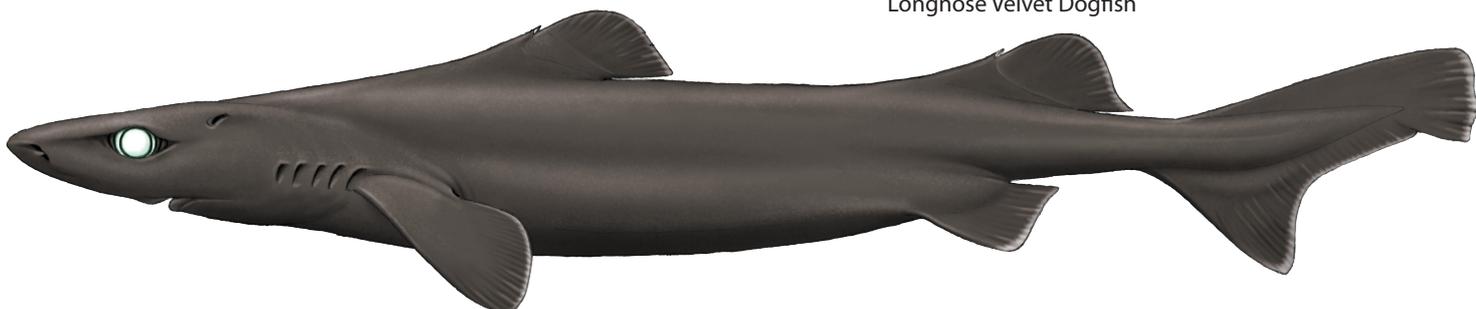
*Deania calcea*,  
Birdbeak Dogfish



*Deania profundorum*,  
Arrowhead Dogfish



*Deania hystricosa*,  
Rough Longnose Dogfish



*Centroselachus crepidater*,  
Longnose Velvet Dogfish

(Not to scale)

### TEETH

The teeth are straight, wide-rooted and unicuspid in the upper jaw and smooth, mouth angle recurved cusp in the lower jaw (Valenzuela *et al.*, 2008). Unlike many deep sea sharks, the Birdbeak Dogfish has compressed cutting teeth in both jaws (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Birdbeak Dogfish can be found from 70–1,450m, although in Australia at least, catch rates are highest between 600 and 1,100m. It is most usually found near the bottom but its diet suggests that it can feed well above the substrate (Stevens, 2003).

#### EGGCASE

N/A

### DIET

The diet of the Birdbeak Dogfish includes fish, cephalopods and crustaceans. In the northeast Atlantic, Namibia, South Africa and Australia, myctophids were also recorded, suggesting that it regularly feeds in the water column far from the bottom (Stevens, 2003).

### REPRODUCTION

Females reach maturity at around 90cm total length, males at around 80cm. This corresponds to an age of 25 years for females and 17 years for males. Given that longevity has been recorded as 35 years, the Birdbeak Dogfish does not reach maturity until very late in its life cycle. Reproduction appears to be non seasonal but the gestation period is unknown. Litters of 1–7 pups have been recorded, each measuring ~30cm total length (Stevens, 2003).

## COMMERCIAL IMPORTANCE

The Birdbeak Dogfish is mainly a bycatch species in trawl and longline fisheries, although it is targeted (particularly in Australia) for its squalene-rich liver oil. Its flesh is sometimes used for human consumption and it can be processed for fishmeal (Stevens, 2003).

## THREATS, CONSERVATION, LEGISLATION

There are currently no quantitative data on population trends for the Birdbeak Dogfish. However, it is a very late maturing species which gives birth to few young after what is most likely a long gestation period. It is therefore vulnerable to overfishing and any expansion of deepwater fisheries targeting sharks should be very carefully monitored (Stevens, 2003).

In ICES sub-areas V, VI, VII, VIII and IX a Total Allowable Catch (TAC) of 1,646 tons (2008) applies to the deepwater sharks *Centroscymnus coelolepis*, *Centrophorus granulosus*, *C. squamosus*, *Deania calceus*, *Dalatias licha*, *Etmopterus princeps*, *E. spinax*, *Centrosyllium fabricii*, *Galeus melastomus*, *G. murinus* and all *Apristurus* spp. Additionally, these species have a TAC of 20 tons in sub-area X and a TAC of 49 tons (including *Deania histricosa* and *D. profundorum*) in sub-area XII (CPOA Shark, 2009).

## IUCN RED LIST ASSESSMENT

Least Concern (2003).

Vulnerable in northeast Atlantic.

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large dorsal spines.
- Sharp teeth.
- Abrasive skin.

### REFERENCES

- COMPAGNO, L. J. V. 1984. Sharks of the World: An Annotated and Illustrated Catalogue of Shark Species Known to Date. Volume 4, Part 1. Hexanchiformes to Lamniformes. FAO. Rome, Italy.
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Text: Richard Hurst.  
Illustrations: Marc Dando.

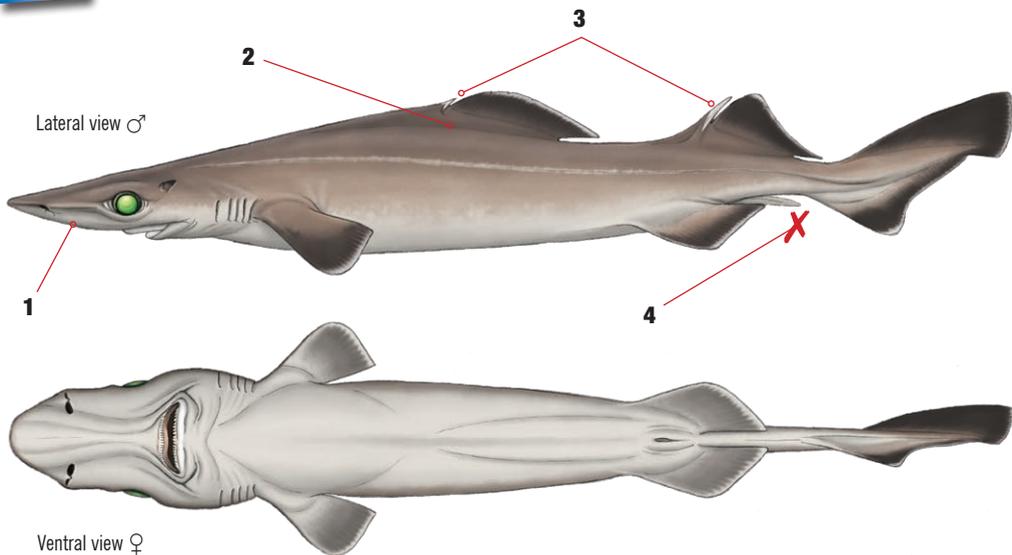
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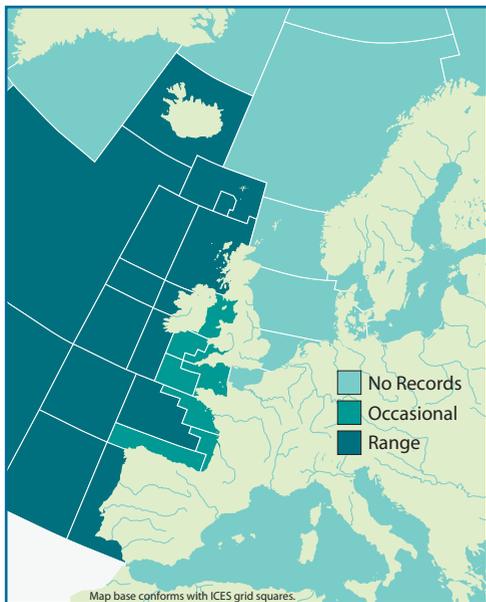


### SCIENTIFIC NAME

*Deania calcea* (Lowe, 1839).

### DISTRIBUTION

Patchy distribution worldwide. East Atlantic from Iceland to Mauritania, possibly to Senegal and Namibia<sup>i</sup>.



### COMMON NAME

**BIRDBEAK DOGFISH**, Brier Shark, Shovelnose Spiny Dogfish, Squale Savate (Fr), Tollo Pajarito (Es).

### IDENTIFICATION

- 1 Extremely long snout.
- 2 First dorsal fin low with extended base.
- 3 Second dorsal spine much larger than first.
- 4 No anal fin<sup>i</sup>.

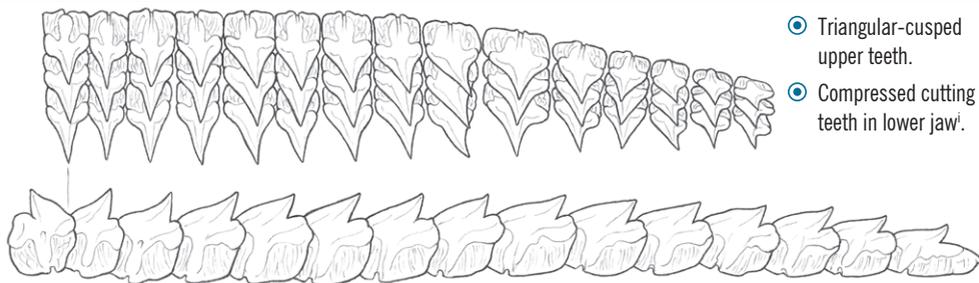
### COLOUR

- Uniform grey brown.
- No pattern or markings on fins<sup>i</sup>.

### BIOLOGY AND SIZE

- Birth: 30 cm. Mature: 100cm ♀, 80cm ♂. Max TL: 122cm<sup>ii</sup>.
- Ovoviviparous species, litters of 6-12 pups have been recorded<sup>ii</sup>.
- Feeds predominantly on fish (>80%) with some cephalopods and few crustaceans<sup>iii</sup>.

## TEETH



- Triangular-cusped upper teeth.
- Compressed cutting teeth in lower jaw<sup>i</sup>.

## SIMILAR SPECIES



Deania calcea, **Birdbeak Dogfish**



Deania profundorum, **Arrowhead Dogfish**



Deania hystricosa, **Rough Longnose Dogfish**



Centroselachus crepidater, **Longnose Velvet Dogfish**

## HANDLING

- Handle with care.
- Large dorsal spines.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

- Compagno, L. J. V.; 1984. FAO.
- Compagno, L. J. V. *et al*; 2005. HarperCollins Publishers
- Cortés, E; 1999. *ICES JMS*.
- Stevens, J; 2003. IUCN Red List.

## HABITAT

- 70–1,450m. In Australia, catch rates highest around 600–1,100m.
- There appears to be some segregation by size and sex.
- Usually found demersally but diet suggests it feeds in the water column<sup>ii</sup>.

## CONSERVATION STATUS

- Currently no quantitative data on population trends. Vulnerable to fishing pressure due to late maturity, lengthy gestation period and few young<sup>iii</sup>.
- Red List status:** Least Concern (2003). Vulnerable in the northeast Atlantic.

## COMMERCIAL IMPORTANCE

- Mainly a bycatch species in trawl and longline fisheries.
- Targeted in some places, particularly Australia, for its liver oil.
- Flesh sometimes used for human consumption and carcasses can be processed for fishmeal<sup>iv</sup>.
- 2010 – Subject to a zero TAC in EU waters.

## DERMAL DENTICLES



Lateral View (♀)



Ventral View (♀)



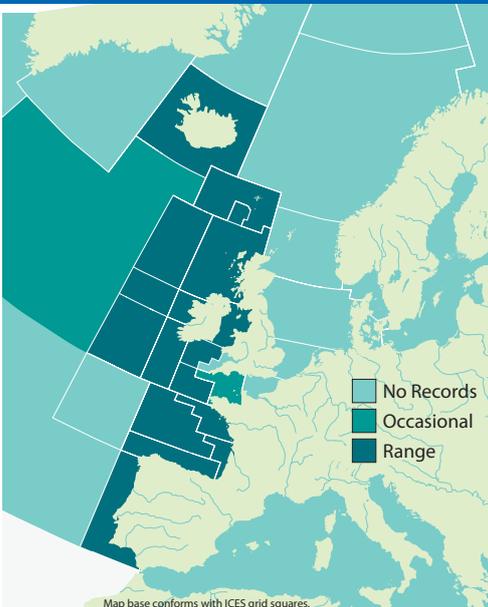
### COMMON NAMES

**Black Dogfish**, Aiguillat (Fr), Tollo Negro (Es), Tollo Negro Merga (Es).

### SYNONYMS

*Spinax fabricii* (Reinhart, 1825).

### DISTRIBUTION



The Black Dogfish is found in the east Atlantic from southern Iceland to Senegal and from Guinea to Namibia. It is also known in the western North Atlantic and has been observed in the western South Atlantic (Burgess and Bester, Unknown).

### APPEARANCE

- Two dorsal fins with grooved spines.
- First dorsal fin small and set well behind the pectoral fins.
- Second dorsal fin larger.
- No anal fin.
- Heterocercal caudal fin.
- Teeth with narrow cusps and cusplets in both jaws.
- Max TL at least 84cm, possibly to 107cm.

A medium sized deep sea shark, the Black Dogfish is the only member of the *Centroscyllium* genus known from the North Atlantic. The first dorsal fin is small and set well behind the pectoral fins. The second dorsal fin is noticeably larger and is set slightly behind the pelvic fins. Both have white, grooved dorsal spines. The dorsal lobe of the caudal fin is larger than the ventral lobe (Compagno, 1984).

The teeth have narrow cusps and cusplets in both jaws. It has luminescent organs scattered in its skin, although they are not arranged in regular arrays as they often are in other deepwater elasmobranchs. The maximum reported total length is 84cm, although it may grow as large as 107cm (Compagno, 1984). Adults are uniform black/brown without any obvious markings. Juveniles are dark black ventrally and lighter brown dorsally with white edged dorsal, pectoral and pelvic fins (Burgess and Bester, Unknown).

## SIMILAR SPECIES

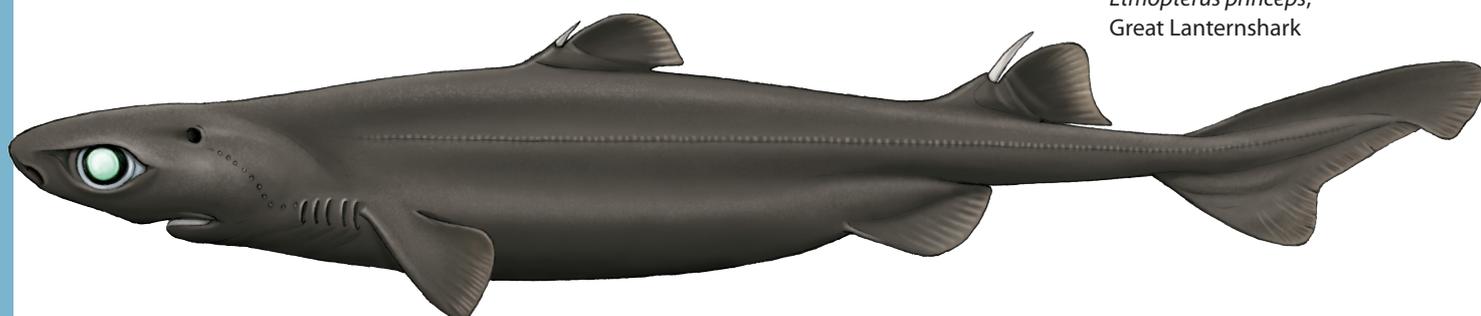
*Etmopterus princeps*, Great Lanternshark

*Etmopterus pusillus*, Smooth Lanternshark

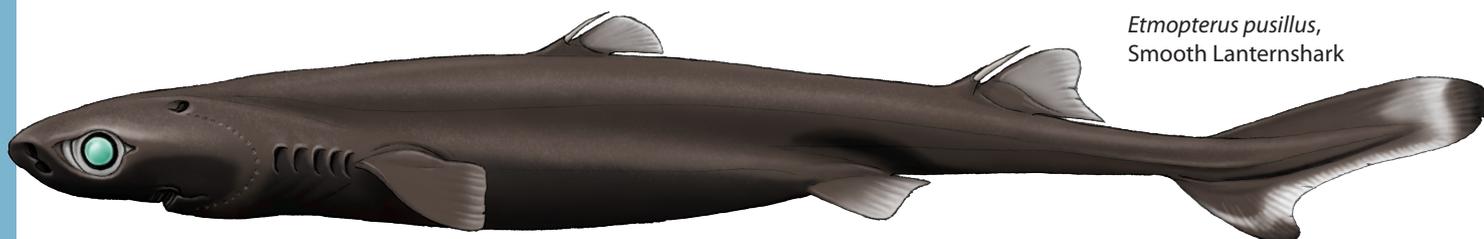
*Etmopterus spinax*, Velvet Belly Lanternshark



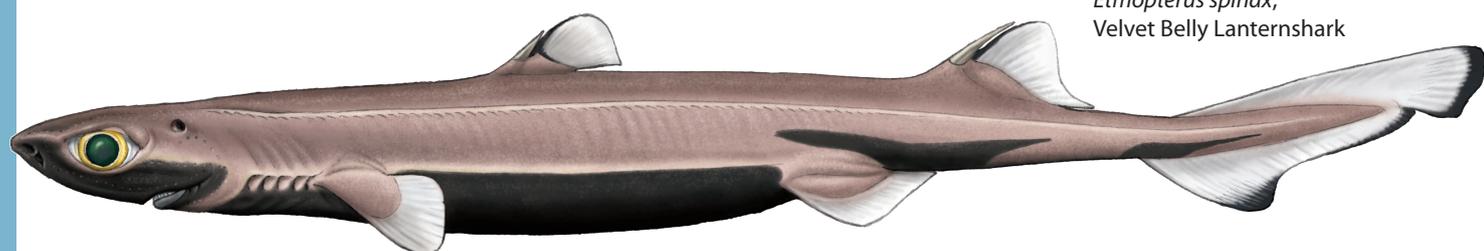
*Centroscyllium fabricii*,  
Black Dogfish



*Etmopterus princeps*,  
Great Lanternshark



*Etmopterus pusillus*,  
Smooth Lanternshark

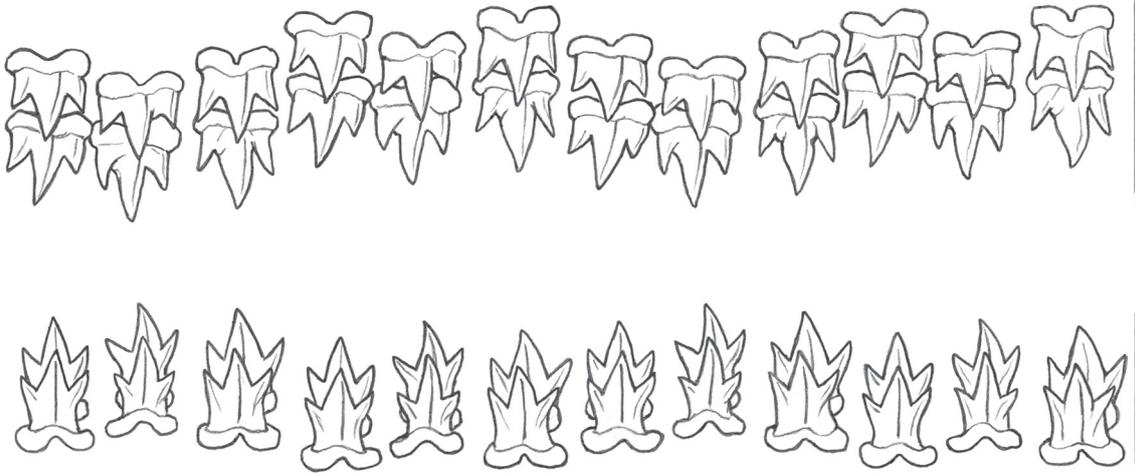


*Etmopterus spinax*,  
Velvet Belly Lanternshark

(Not to scale)

### TEETH

The teeth have narrow cusps and cusplets in both jaws (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Black Dogfish is taken primarily in depths of 550–1,000m and temperatures of 3.5–4.5°C, although it has been found from 180–1,653m and in water as cold as 1°C (Burgess and Bester, Unknown; Martin and MacKinlay, 2002). It is a benthic species normally confined to the outer and upper continental shelf, although it has been taken near the surface in Arctic waters and during periods of unusual cold. (Burgess and Bester, Unknown).

#### EGGCASE

N/A

#### DIET

The Black Dogfish is known to consume cephalopods, benthic and pelagic crustaceans, euphysiids, schyphozoans and small fish such as redfish (*Sebastes*) (Burgess and Bester, Unknown). In the northwest Atlantic the main prey items are *Acanthephyra* spp. and *Pasiphaea tarda*. It appears that, on the Grand Bank and Flemish Cap at least, intermediately sized Black Dogfish feed primarily on fish while larger specimens prey more on schyphozoans (jellyfish) (González *et al.*, 2007).

#### REPRODUCTION

Male Black Dogfish mature at a total length of around 55cm, females at around 65cm. There does not appear to a defined breeding period with pregnant females found year round. The gestation period is unknown but is likely to be lengthy, similar to other deep-sea elasmobranchs. Development is ovoviviparous and litters of 4–40 individuals have been recorded. These pups measure around 15cm total length (Burgess and Bester, Unknown).

## COMMERCIAL IMPORTANCE

The Black Dogfish is taken as bycatch in deepwater fisheries but not in large enough numbers to support a commercial fishery. Most are discarded at sea but some are landed and processed for fishmeal (Burgess and Bester, Unknown). In some cases, the liver and fins are removed at sea and the carcass is discarded (Clarke *et al.*, 2005).

## THREATS, CONSERVATION, LEGISLATION

The Black Dogfish has a wide distribution throughout the temperate Atlantic. In the northeast Atlantic it is regularly taken as bycatch in deepwater fisheries, though its wide distribution offers it refuge in areas where fisheries are not so well developed. While data is incomplete, recent population trends appear stable (Gibson *et al.*, 2006).

In ICES sub-areas V, VI, VII, VIII and IX a Total Allowable Catch (TAC) of 1,646 tons (2008) applies to the deepwater sharks *Centroscymnus coelolepis*, *Centrophorus granulosus*, *C. squamosus*, *Deania calcea*, *Dalatias licha*, *Etmopterus princeps*, *E. spinax*, *Centrosyllium fabricii*, *Galeus melastomus*, *G. murinus* and all *Apristurus* spp. Additionally, these species have a TAC of 20 tons in sub-area X and a TAC of 49 tons (including *Deania histricosa* and *D. profundorum*) in sub-area XII (CPOA Shark, 2009).

## IUCN RED LIST ASSESSMENT

Least Concern (2008).

Near Threatened in northeast Atlantic.

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large dorsal spines.
- Abrasive skin and sharp teeth.

### REFERENCES

- BURGESS, G., BESTER, C. Unknown. Black Dogfish. Florida Museum of Natural History. <http://www.flmnh.ufl.edu/fish/>.
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Text: Richard Hurst.  
Illustrations: Marc Dando.

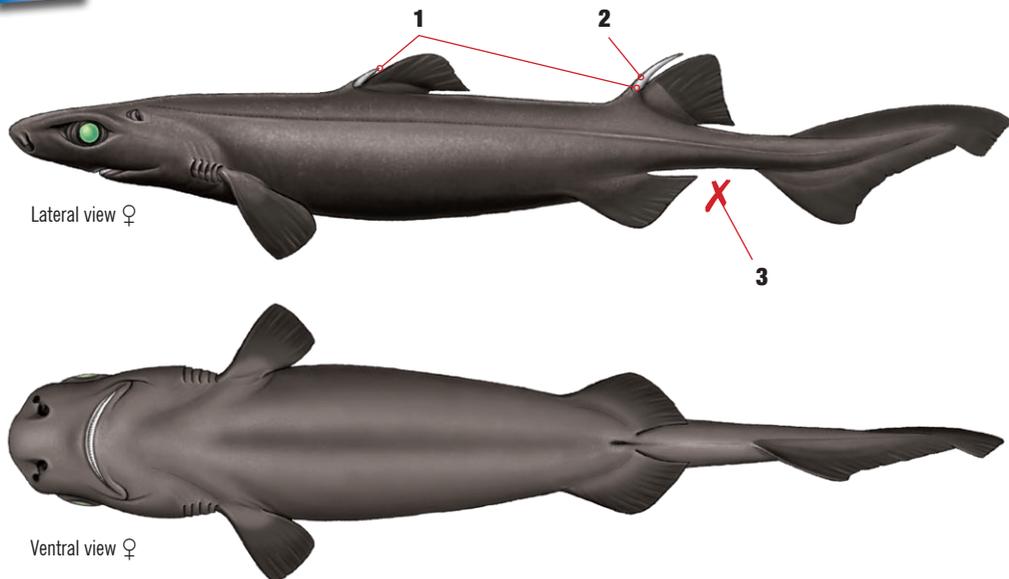
#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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## SCIENTIFIC NAME

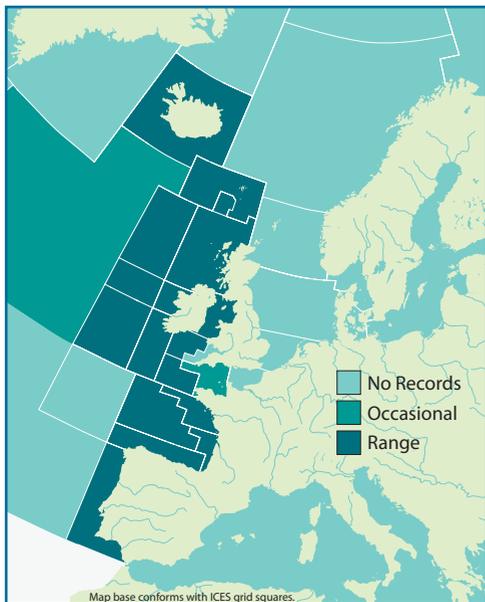
*Centroscyllium fabricii* (Reinhardt, 1825).

## COMMON NAME

**BLACK DOGFISH**, Aiguillat Noir (Fr), Tollo Negro Merga (Es).

## DISTRIBUTION

Found across the North Atlantic. East Atlantic from southern Iceland to Senegal and from Guinea to Namibia<sup>1</sup>.



## IDENTIFICATION

- 1 Grooved, light coloured dorsal spines.
- 2 Second dorsal fin and spine larger than first.
- 3 No anal fin<sup>iii</sup>.

## COLOUR

- Uniform black/brown in adults.
- Juveniles lighter dorsally with white edged precaudal fins<sup>i</sup>.

## BIOLOGY AND SIZE

- Born: 15cm. Mature: 50–66cm ♀, 46–50cm ♂<sup>iv</sup>. Max TL: 84cm, possibly to 107cm<sup>iii</sup>.
- Feeds on some fish and cephalopods but mostly crustaceans<sup>v</sup>.
- Litters of 4–40 pups have been recorded with an average of 16<sup>vi</sup>.

## TEETH



- Teeth with narrow cusps and cusplets in both jaws<sup>iii</sup>.
- Only deepwater shark in the region with similar teeth in both jaws<sup>vi</sup>.

## SIMILAR SPECIES



*Centroscyllium fabricii*, **Black Dogfish**



*Etmopterus princeps*, **Greater Lanternshark**



*Etmopterus pusillus*, **Smooth Lanternshark**



*Etmopterus spinax*, **Velvet Belly Lanternshark**

## HABITAT

- 180–1,653m, most common 550–1,000m<sup>i</sup>.
- Prefer 3.5–4.5°C<sup>i</sup> but have been found to 1°C<sup>viii</sup>.
- Have been taken near the surface in Arctic waters during extremely cold periods<sup>i</sup>.
- Segregate by size and sex, sometimes form schools<sup>iv</sup>.

## CONSERVATION STATUS

- Data lacking but it is taken in large quantities in the northeast Atlantic. Most populations appear stable<sup>vii</sup>.
- Red List status:** Least Concern (2008). Near Threatened in northeast Atlantic.

## COMMERCIAL IMPORTANCE

- Can be taken in large numbers in some areas such as the Hatton Bank.
- Generally discarded due to its small size<sup>vi</sup>.
- If retained, the flesh and liver oil may be utilised<sup>ii</sup>.
- 2010 – Subject to a zero TAC in EU waters.

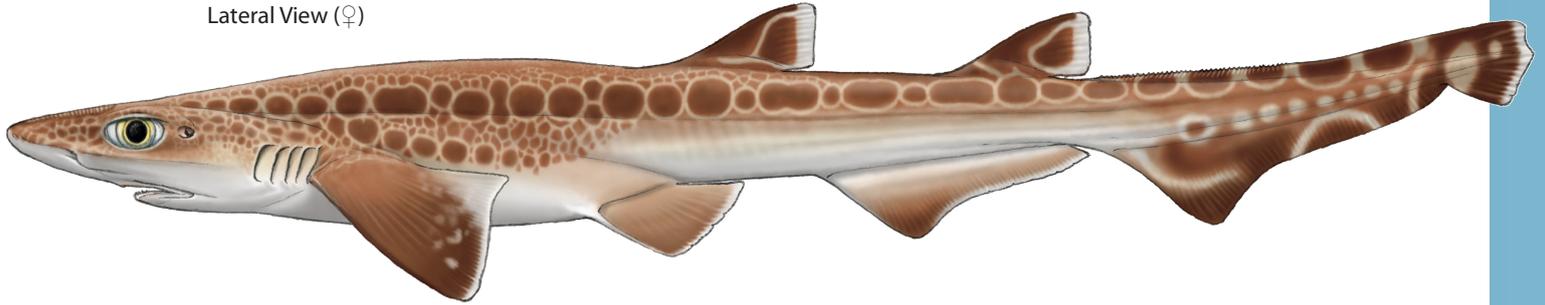
## HANDLING

- Handle with care.
- Large dorsal spines.
- Abrasive skin and sharp teeth.

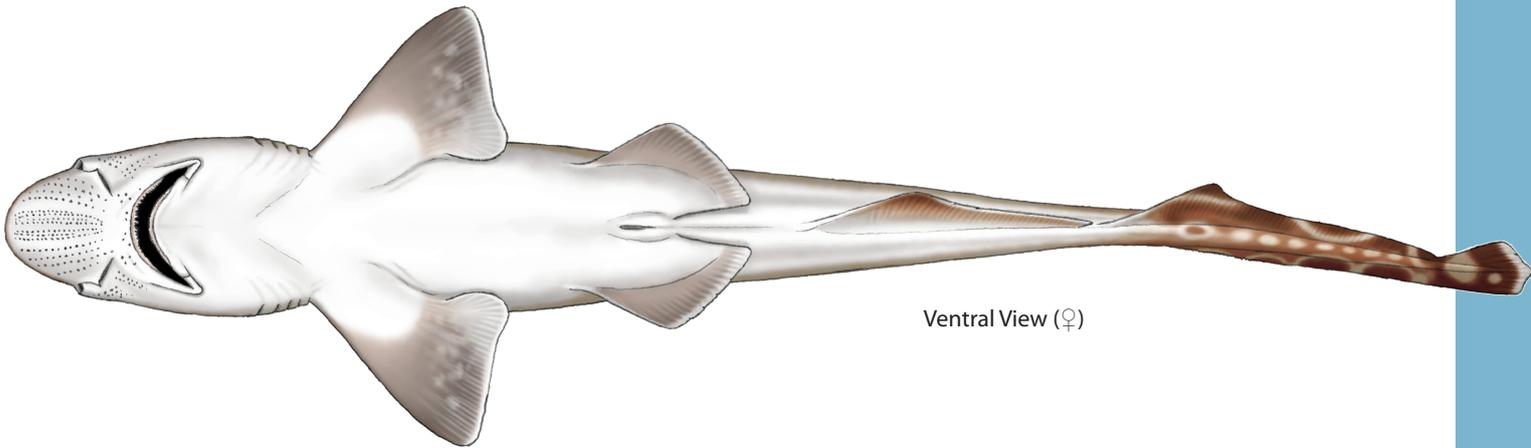
## REFERENCES

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- Yano, K.; 1995. *JMBA*.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Blackmouth Catshark**, Blackmouth Dogfish, Blackmouth Angler, Mouse Catshark, Chien Espagnol (Fr), Pintarroja Bocanegra (Es).

### SYNONYMS

*Squalus delarochianus* (Blainville, 1816), *Scyllium artedii* (Risso, 1820), *Squalus prionurus* (Otto, 1821), *Squalus annulatus* (Nilsson, 1832), *Scyllium melanostomum* (Bonaparte, 1834), *Pristiurus souverbiei* (LaFont, 1866), *Pristiurus atlanticus* (Vaillant, 1888).

### DISTRIBUTION



The Blackmouth Catshark is found in the east Atlantic from the Faroe Islands and Norway in the north to Senegal in the south and throughout the Mediterranean (Compagno, 1984).

### APPEARANCE

- Very slender body.
- Long anal fin.
- Origin of first dorsal fin over pelvic fins.
- Long dorsal lobe of caudal fin.
- Inside of mouth black.
- Dorsal colouration brown/tan with pattern of 15–18 dark saddles and spots.
- Ventrally white.
- Maximum total length of 90cm.

A strikingly coloured, slender shark, the Blackmouth Catshark's most distinctive feature is the inside of its mouth. This is black, giving the species its common name. The dorsal colouration is also distinctive with a pattern of dark blotches and saddles which contrast starkly with the white underside. Its anal fin is extremely long, the base of which can be as much as 13–18% of the total length of the animal. Its dorsal fins are set well back, the first level with the free ends of the pelvic fins. The tail is also distinctively long, adding to the overall slender appearance of the shark. The maximum recorded length of the Blackmouth Catshark is 90cm, although individuals between 60 and 80cm in length are more common (Compagno, 1984).

## SIMILAR SPECIES

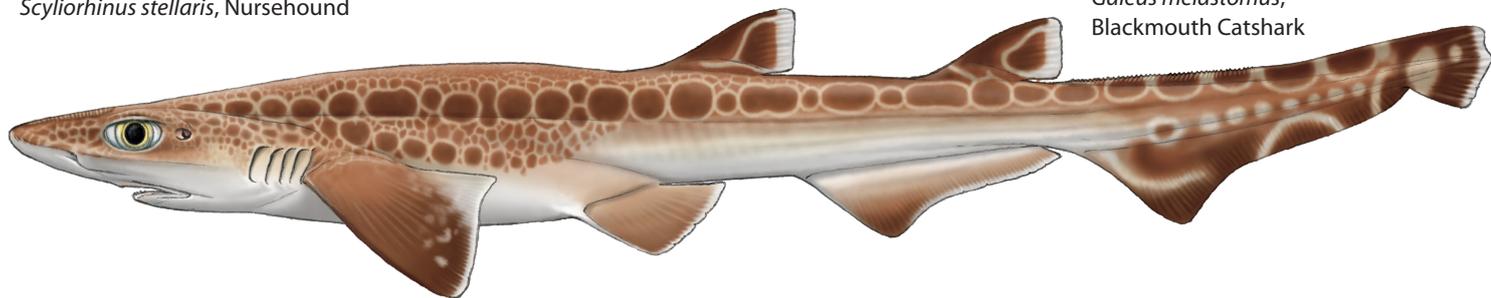
*Galeus atlanticus*, Atlantic Sawtail Catshark

*Galeus murinus*, Mouse Catshark

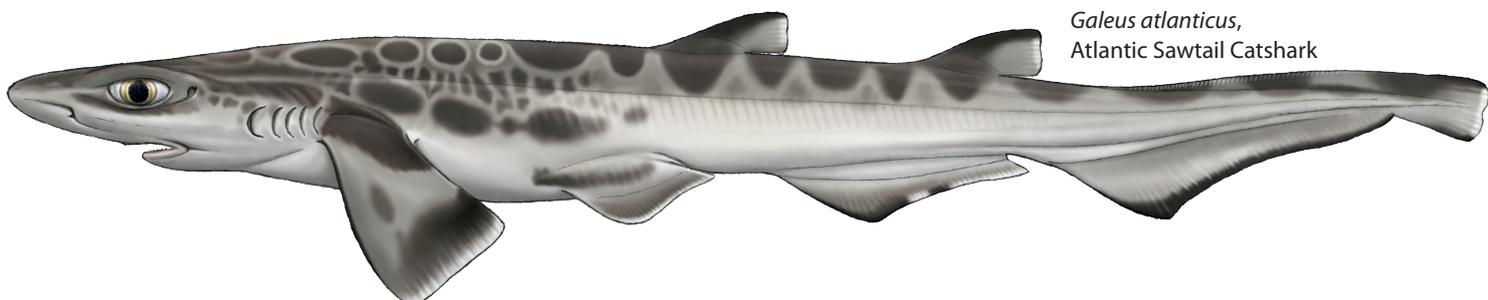
*Scyliorhinus canicula*, Small Spotted Catshark

*Scyliorhinus stellaris*, Nursehound

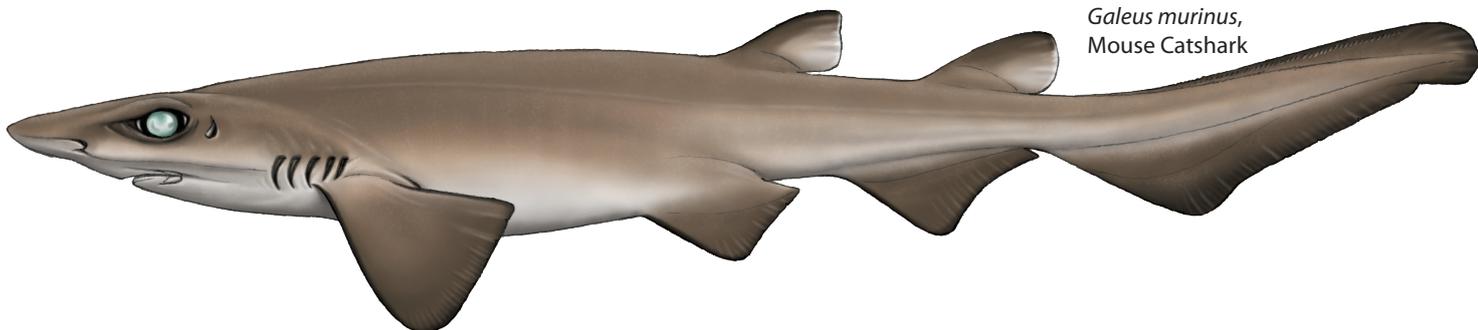
*Galeus melastomus*,  
Blackmouth Catshark



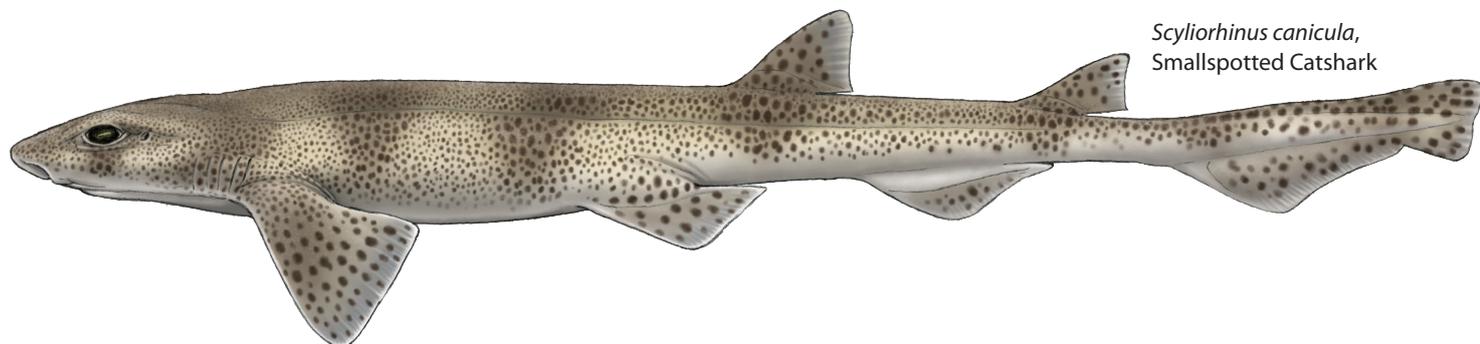
*Galeus atlanticus*,  
Atlantic Sawtail Catshark



*Galeus murinus*,  
Mouse Catshark



*Scyliorhinus canicula*,  
Smallspotted Catshark



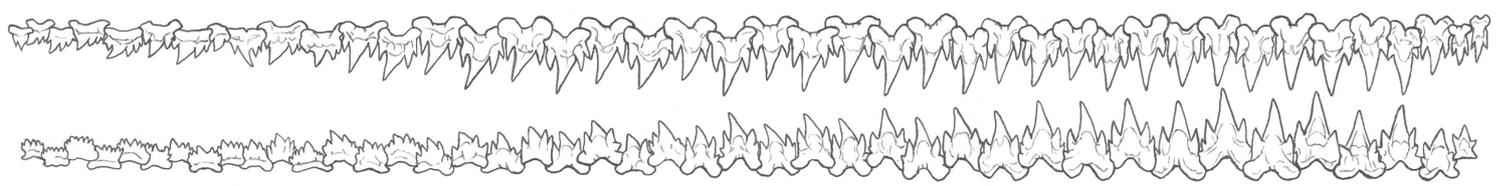
*Scyliorhinus stellaris*,  
Nursehound



(Not to scale)

### TEETH

The teeth have sharp cusps with two cusplets in the upper jaw. The teeth are similar but with up to 4 cusplets in the lower jaw (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

The depth range of the Blackmouth Catshark has been reported as 55-1,200 metres but it is most usually found between 200 and 500m (Compagno, 1984). In southwest Mediterranean scientific trawls, the highest abundance was found between 501 and 800m. The same study discovered that adults and larger juveniles were found exclusively below 500m while recruits were found throughout the depth range (Rey *et al.*, 2004).

#### EGGCASE

1. 5.1–6.5cm in length.
2. 1.8–3.0cm in width.
3. No tendrils or horns (Compagno, 1984).

Similar eggcase to the Nursehound, *Scyliorhinus stellaris*.



#### DIET

The Blackmouth Catshark feeds mainly on bottom invertebrates including shrimps and cephalopods. It is also known to feed on small mesopelagic bony fishes (lanternfishes) and other small elasmobranchs (Compagno, 1984).

#### REPRODUCTION

Males are known to mature around 34-42cm, females around 39-45cm in length. An oviparous species, up to 13 eggcases have been found in females oviducts at one time. The eggcases measure 5.1-6.5cm long by 1.8-3.0cm wide and lack tendrils, distinguishing them from other catshark eggcases found around the UK (Compagno, 1984).

## COMMERCIAL IMPORTANCE

The Blackmouth Catshark is taken as bycatch in demersal trawl and longline fisheries and is generally discarded. It is sometimes retained and utilised for fishmeal, leather and human consumption (Gibson *et al.*, 2006).

## THREATS, CONSERVATION, LEGISLATION

Research trawls have shown the Blackmouth Catshark to be a very abundant species, particularly off the southwest of Iceland, on the Hatton Bank, off the northwest of Ireland and in the Alboran Sea in the western Mediterranean. It appears no significant population declines have occurred and the species is stable. However, with expanding deepwater fisheries, continued monitoring and management is important (Gibson *et al.*, 2006).

In ICES sub-areas V, VI, VII, VIII and IX a Total Allowable Catch (TAC) of 1,646 tons (2008) applies to the deepwater sharks *Centroscyrnus coelolepis*, *Centrophorus granulosus*, *C. squamosus*, *Deania calceus*, *Dalatias licha*, *Etmopterus princeps*, *E. spinax*, *Centroscyllium fabricii*, *Galeus melastomus*, *G. murinus* and all *Apristurus* spp. Additionally, these species have a TAC of 20 tons in sub-area X and a TAC of 49 tons (including *Deania histricosa* and *D. profundorum*) in sub-area XII (CPOA Shark, 2009).

## IUCN RED LIST ASSESSMENT

Least Concern (2008).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

### REFERENCES

- COMPAGNO, L. J. V. 1984. Sharks of the World: An Annotated and Illustrated Catalogue of Shark Species Known to Date. Volume 4, Part 1. Hexanchiformes to Lamniformes. FAO. Rome, Italy.
- GIBSON, C., VALENTI, S. V., FOWLER, S. L., FORDHAM, S. V. 2006. The Conservation Status of Northeast Atlantic Chondrichthyans; Report of the Shark Specialist Group Northeast Atlantic Regional Red List Workshop. VIII + 76pp. IUCN SSC Shark Specialist Group.
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Text: Richard Hurst.  
Illustrations: Marc Dando.

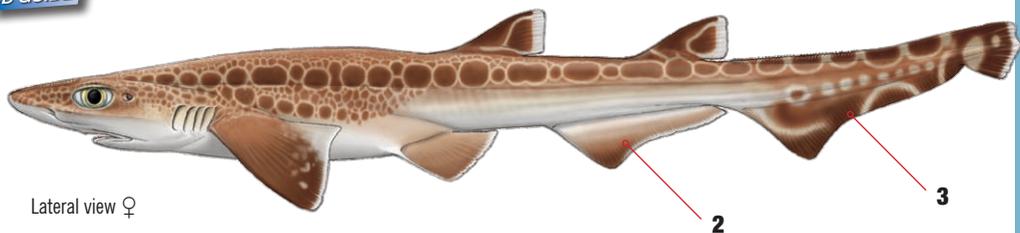
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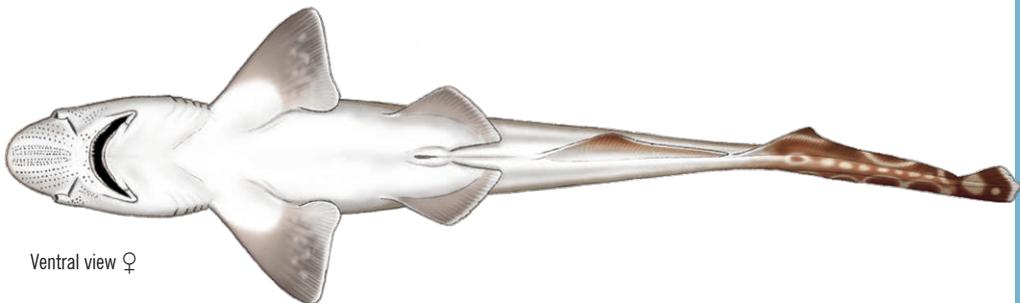
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Lateral view ♀



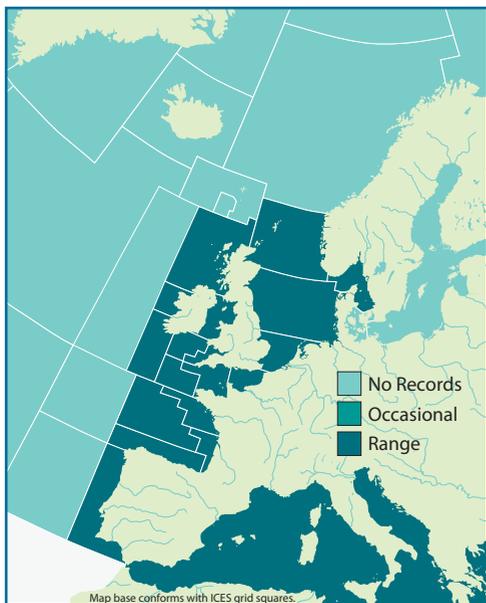
Ventral view ♀

## SCIENTIFIC NAME

*Galeus melastomus* (Rafinesque, 1810).

## DISTRIBUTION

East Atlantic from Norway to Senegal, including the Mediterranean Sea<sup>1</sup>.



## COMMON NAME

**BLACKMOUTH CATSHARK**, Blackmouth Dogfish, Blackmouth Angler, Mouse Catshark, Chien Espagnol (Fr), Pintarroja Bocanegra (Es).

## IDENTIFICATION

- 1 Long, slender body.
- 2 Long anal fin.
- 3 Extended dorsal caudal lobe<sup>1</sup>.

## COLOUR

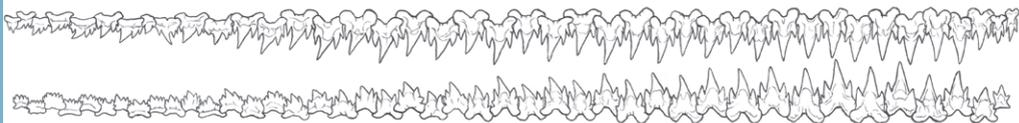
- Inside of mouth black.
- Brown dorsally with 15–18 large, dark saddles and numerous smaller spots.
- Ventrally white<sup>1</sup>.

## BIOLOGY AND SIZE

- Mature: 39–45cm ♀, 34–42cm ♂. Max TL: 90cm<sup>1</sup>.
- Up to 13 eggcases have been found in a female's oviduct.
- Feed predominantly on bottom invertebrates such as shrimp and cephalopods. Also prey on bony fishes and other small elasmobranchs<sup>1</sup>.



## TEETH



- Sharp cusps with 2 cusplets in upper jaw.
- Similar, with up to 4 cusplets in lower jaw<sup>1</sup>.

## SIMILAR SPECIES



- Galeus melastomus*, **Blackmouth Catshark**



- Galeus atlanticus*, **Atlantic Sawtail Catshark**



- Galeus murinus*, **Mouse Catshark**



- Scyliorhinus canicula*, **Smallspotted Catshark**



- Scyliorhinus stellaris*, **Nursehound**

## HABITAT

- 55–1,200m, most common 200–500m.
- Predominantly benthic but can feed in the water column<sup>1</sup>.
- Segregate by size with adults and juveniles found deeper than recruits<sup>2</sup>.

## CONSERVATION STATUS

- Abundant species with populations which appear to be stable. Could be negatively affected by expanding deepwater fisheries<sup>iii</sup>.
- Red List status:** Least Concern (2008).

## COMMERCIAL IMPORTANCE

- Taken as bycatch in demersal trawl and longline fisheries, generally discarded.
- If retained it may be used for human consumption or fishmeal<sup>iii</sup>.
- 2010 – Subject to a zero TAC in EU waters.

## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## EGGCASE

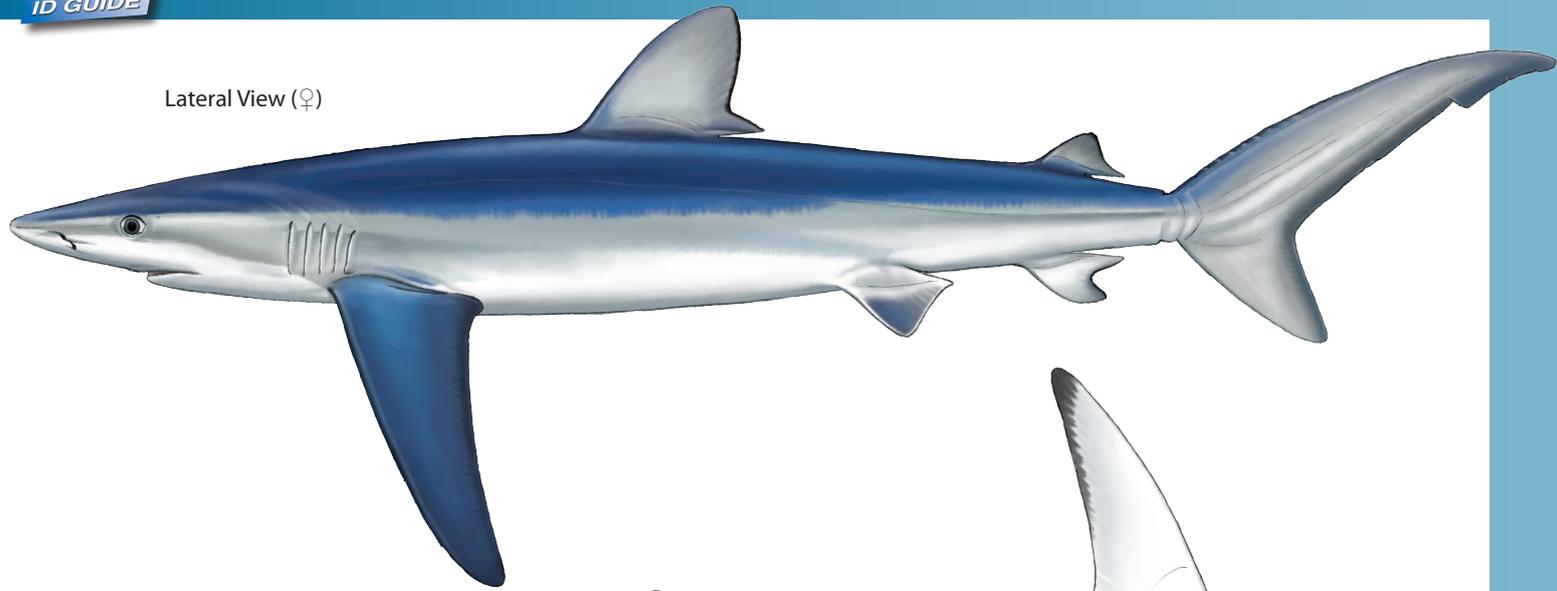
- 51–65mm long.
- 18–30mm wide.
- No tendrils or horns<sup>1</sup>.



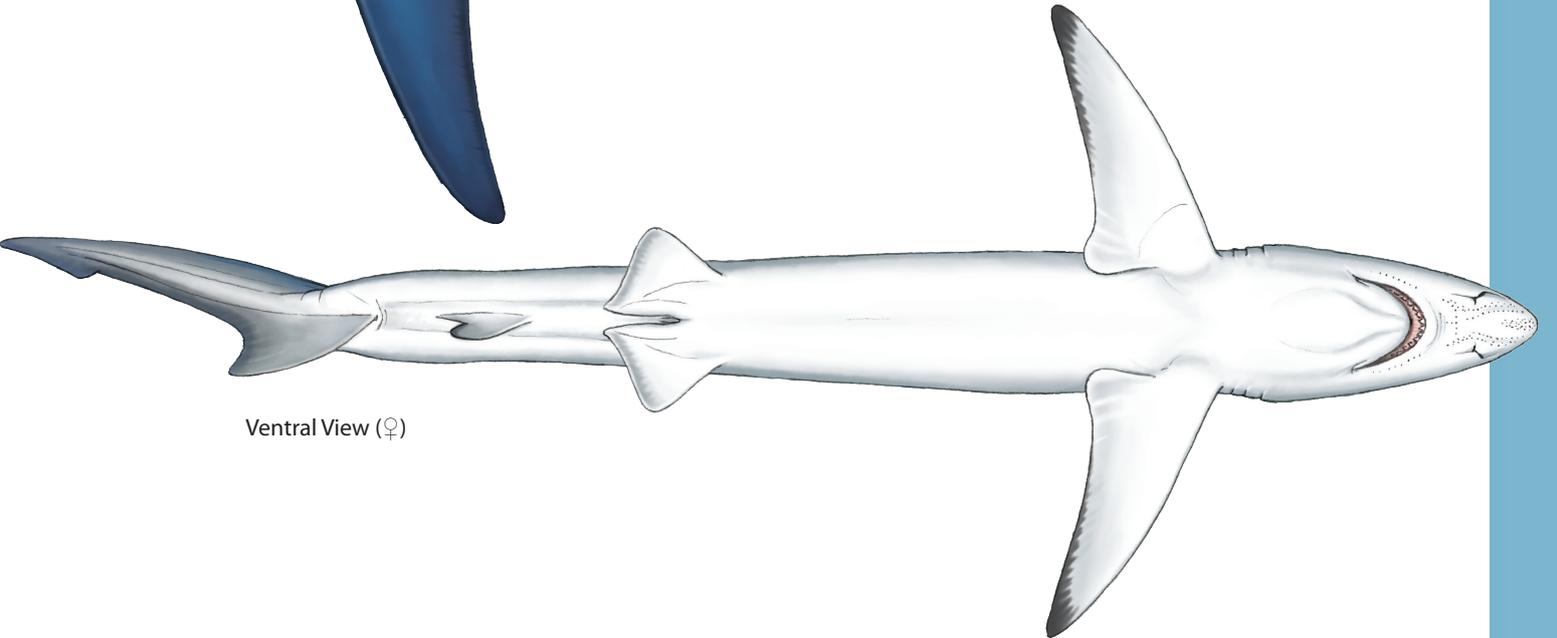
## REFERENCES

- Compagno, L. J. V.; 1984. FAO.
- Rey, J. *et al*; 2004. *J. Northw. Atl. Fish. Sci.*
- Serena, F. *et al*; 2008. IUCN Red List.

Lateral View (♀)



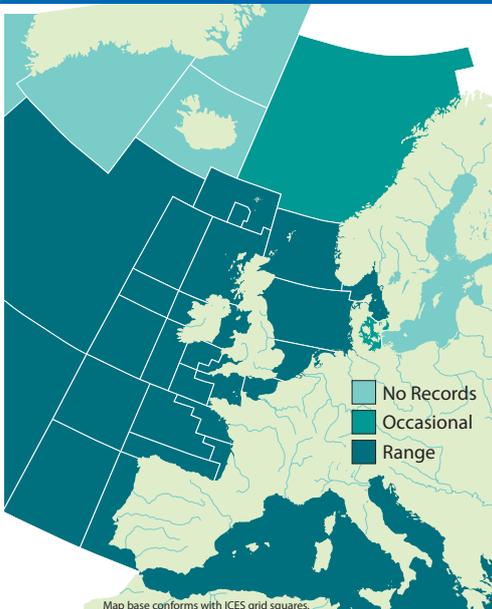
Ventral View (♀)



### SYNONYMS

*Squalus glaucus* (Linnaeus, 1758), *Squalus adscensionis* (Osbeck, 1765), *Squalus rondeletii* (Risso, 1810), *Squalus caeruleus* (Blainville, 1825), *Galeus thalassinus* (Valenciennes, 1835), *Thalassorhinus vulpecula* (Valenciennes, 1838), *Carcharias hirundinaceus* (Valenciennes, 1839), *Thalassinus rondeletii* (Moreau, 1881), *Carcharias pugae* (Perez Canto, 1886), *Carcharias gracilis* (Philippi, 1887), *Hypoprion/Hemigaleus isodus* (Philippi, 1887), *Carcharias aethiops* (Philippi, 1896), *Prionace macki* (Phillips, 1935).

### DISTRIBUTION



Possibly the widest ranging of all chondrichthyans, the Blue Shark is found in temperate and tropical waters worldwide. In the east Atlantic it is found from Norway to South Africa, including the Mediterranean. It is also found in the west Atlantic Ocean, the whole Pacific Ocean and the whole Indian Ocean (Kohler *et al.*, 2002; Cooper, Unknown).

### COMMON NAMES

**Blue Shark**, Blue Dog, Blue Whaler, Peau Bleue (Fr), Tiburón Azul (Es).

### APPEARANCE

- Slender body.
- Long, rounded snout.
- Very long, pointed pectoral fins.
- First dorsal fin closer to pelvic fins than pectoral fins.
- Second dorsal fin equal in size to and directly above anal fin.
- Caudal fin non lunate with a large terminal lobe.

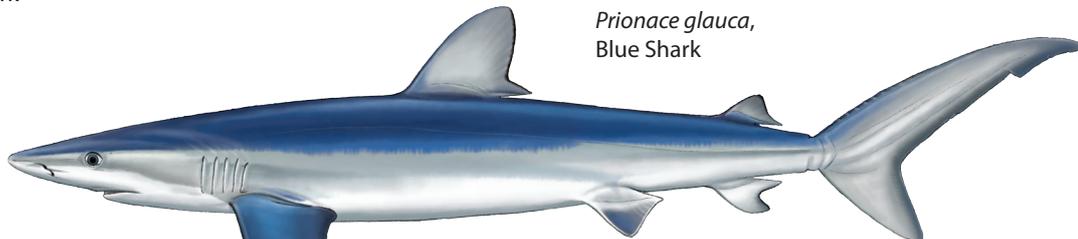
The Blue Shark is a large, slender-bodied requiem shark with a long, narrow snout. The first dorsal fin originates well behind the pectoral fin free tips in individuals over 100cm. The pectoral fins are long and curved. The second dorsal fin is roughly equal in size to the anal fin, over which it is positioned. The dorsal lobe of the caudal fin is larger than the ventral lobe and has a terminal lobe which covers less than a third of its length (Compagno, 1984).

It is a distinct metallic blue on the back and flanks, ventrally it is pure white. This counter-shading provides some camouflage in the open ocean. It reaches a maximum size of 383cm (Cooper, Unknown)

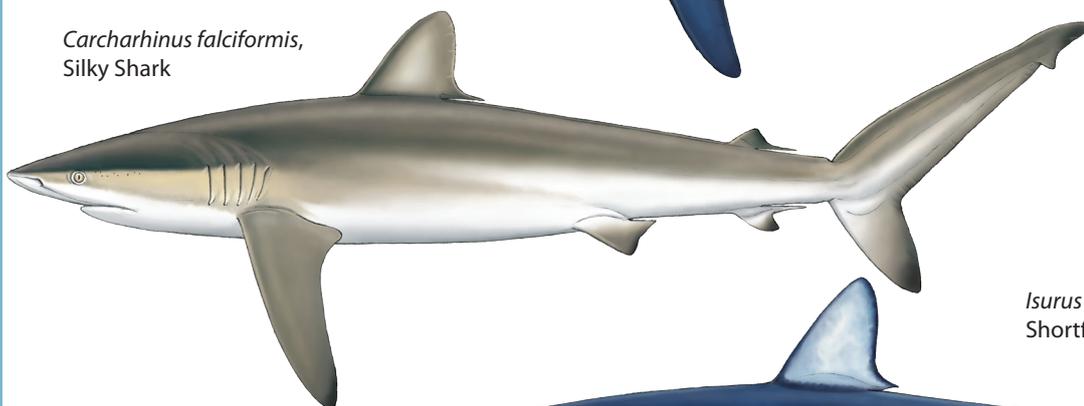
## SIMILAR SPECIES

- Carcharhinus falciformis*, Silky Shark
- Isurus oxyrinchus*, Shortfin Mako Shark
- Isurus paucus*, Longfin Mako Shark
- Lamna nasus*, Porbeagle Shark
- Galeorhinus galeus*, Tope

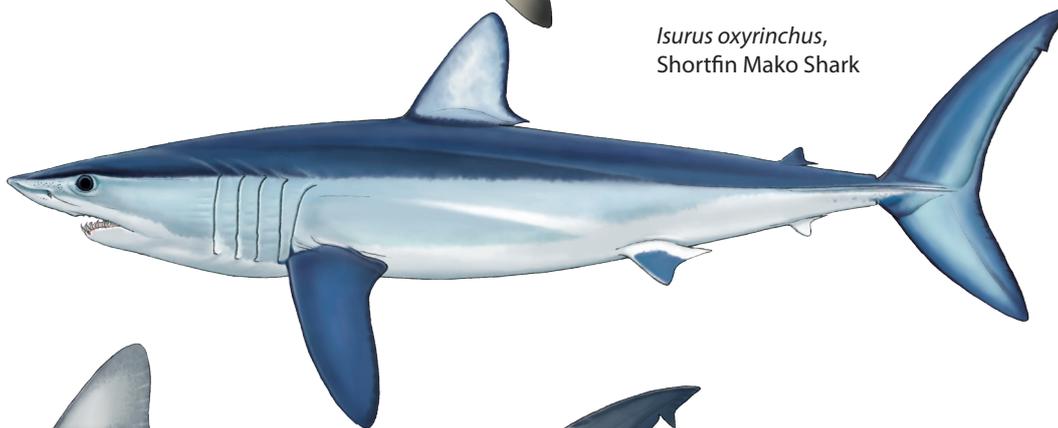
*Prionace glauca*,  
Blue Shark



*Carcharhinus falciformis*,  
Silky Shark



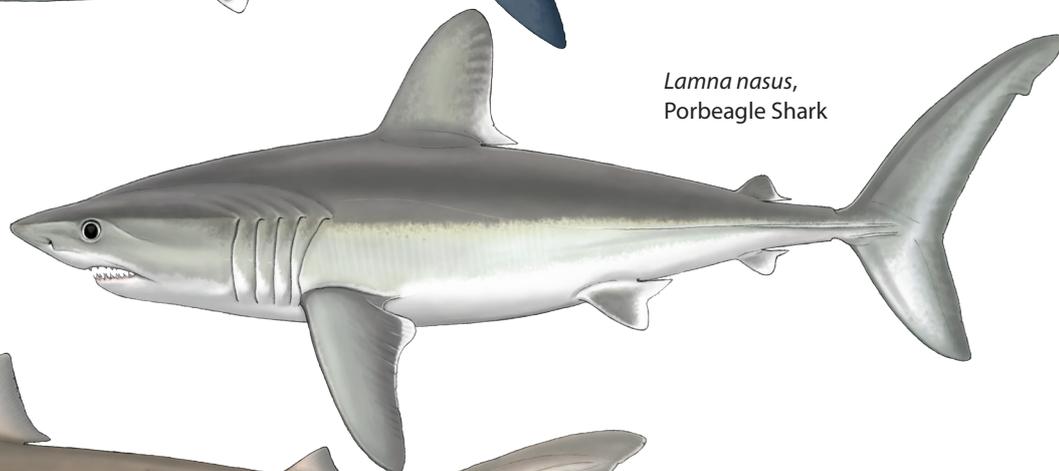
*Isurus oxyrinchus*,  
Shortfin Mako Shark



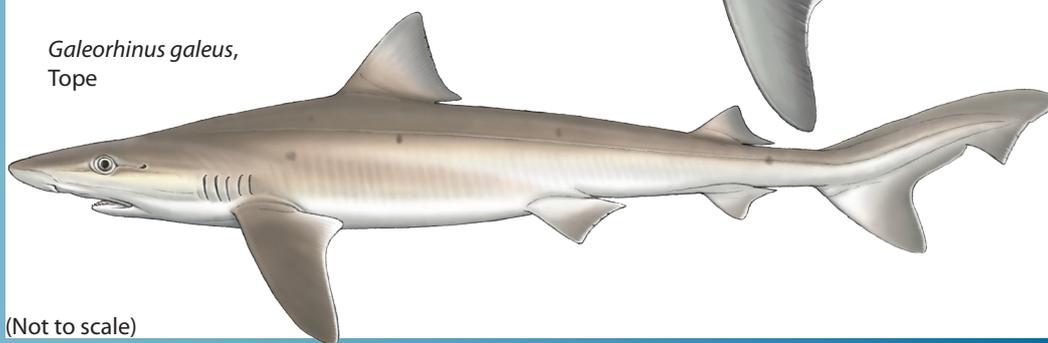
*Isurus paucus*,  
Longfin Mako Shark



*Lamna nasus*,  
Porbeagle Shark



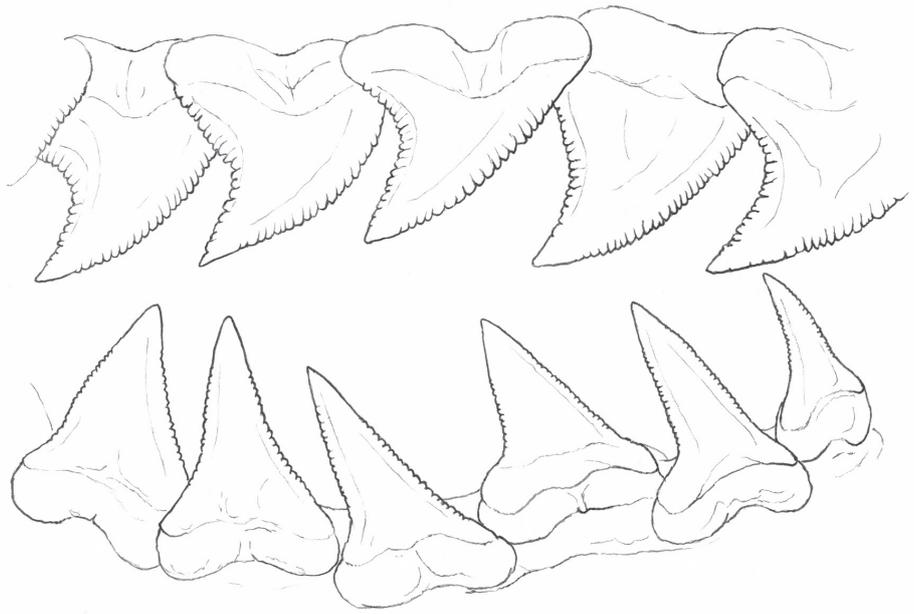
*Galeorhinus galeus*,  
Tope



(Not to scale)

### TEETH

The upper teeth are triangular and curved with serrated edges and overlapping bases. There is a symmetrical symphyseal tooth with 14 teeth either side. The lower teeth are nearly symmetrical with fine serrations and there are 13–15 teeth either side (Cooper, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

A pelagic species, the Blue Shark can be found from the surface to at least 600m. It has a preference for temperate and subtropical waters from 12–20°C but can tolerate temperatures from 8–29.5°C. The Blue Shark is found in the tropics but tends to seek cooler water at depth (Kohler *et al.*, 2002). In the tropical Indian Ocean the temperature can fall from 25°C at 80m to 12°C at 220m (Cooper, Unknown).

In the North Atlantic, tag and recapture studies have shown that a regular clockwise trans-Atlantic migration occurs following the major currents. It appears that sharks tagged off the east coast of the USA follow the Gulf Stream to Europe, ride various currents south along the coasts of Europe and Africa and then follow the Atlantic North Equatorial Current to the Caribbean. Because of this, the entire North Atlantic population is considered a single stock. There have been reports of tagged sharks crossing the equator into the South Atlantic. While this appears to be a rare occurrence, it shows that there is some genetic exchange between the two areas. There is considerable sexual segregation in populations with females more abundant at higher latitudes than males (Kohler *et al.*, 2002).

#### DIET

The diet of the Blue Shark consists mainly of small pelagic fish and cephalopods, particularly squid. However, invertebrates (mainly pelagic crustaceans), small sharks, seabirds and cetaceans (possibly carrion) are also taken. Most of the prey is pelagic although bottom fishes are also found in stomach contents. It appears to feed 24 hours a day with increased activity in the early evening and at night (Stevens, 2000).

#### REPRODUCTION

The Blue Shark reproduces through placental, or yolk-sac, viviparity. At the start of the gestation period, the embryos are nourished by a yolk supply in a very similar way to the 60% of elasmobranchs which reproduce vivipariously. However once this yolk supply is used up the yolk-sac changes, becoming more folded and wrinkled. It can now interlock with the lining of the mother's uterus. The blood supply to both the yolk-sac and the uterus wall increases allowing nutrients and oxygen to pass from the mother to the embryo and vice versa for waste, very much like a mammalian placenta (Martin, 1994).

Males are believed to reach sexual maturity between four and five years of age at a length of 182–291cm. Females mature later between five and six years at a length of 221–323cm (Cooper, Unknown). In temperate waters, mating occurs from late spring to early winter. Gestation varies from 9–12 months and young are born in spring to early summer. In tropical seas, mating is thought to occur all year round (Compagno, 1984). The number of young born is highly variable with litters from 4–135 pups recorded, although the average is around 35. These pups measure 35–50cm in length and remain in nursery areas for the first few years of life, during which they grow rapidly. It appears that for Atlantic sharks, the Mediterranean is an important nursery area (Kohler *et al.*, 2002).

## COMMERCIAL IMPORTANCE

Thought to be the most heavily fished shark, the Blue Shark is mainly taken as bycatch in pelagic longlines but also in pelagic trawls, hook and line and bottom trawls inshore (Compagno, 1984). Keeping the meat is difficult as it ammoniates quickly, therefore the vast majority are discarded at sea after their fins are removed for sale in the Asian fin trade (Cooper, Unknown). When it is landed whole its flesh can be used for human consumption, its liver for oil, its carcass can be processed for fishmeal and its hide can be used for leather (Compagno, 1984).

## THREATS, CONSERVATION, LEGISLATION

Thought to be one of the most abundant and widespread large animals on the planet, the Blue Shark is heavily fished throughout its range by pelagic longlines and hook-and-lines. Its flesh is not highly valued but its fins are, meaning many Blue Sharks are finned at sea and subsequently discarded. It is also considered a game fish and large numbers are taken by recreational anglers every year, although many now return the sharks they catch alive (Stevens, 2000).

In the northeast Atlantic, the Blue Shark is covered by EC Regulation No. 1185/2003 which prevents the removal of fins at sea and the subsequent discard of the body. This applies to all vessels operating in EC waters, as well as to EC vessels operating anywhere (CPOA Sharks, 2009). However, loopholes in this legislation allow many fishing boats to continue this practice. In addition, as it is a highly migratory species, localised legislation may have little effect on wider populations.

While the Blue Shark is relatively highly fecund and has a wide range which buffers it from the effects of heavy fishing pressure, population declines are still being observed across its range. Catches need to be monitored and legislation needs to be created, changed or enforced if population declines are to be halted (Stevens, 2005).

## IUCN RED LIST ASSESSMENT

Near Threatened (2000).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large shark with powerful jaws and sharp teeth.
- Abrasive skin.

## REFERENCES

- COMPAGNO, L. J. V. 1984. FAO Species Catalogue, Vol. 4, Part 2, Sharks of the World: An Annotated and Illustrated Catalogue of Shark Species Known to Date. FAO. Rome, Italy.
- COOPER, P. Unknown. Blue Shark. Florida Museum of Natural History. <http://www.flmnh.ufl.edu/fish/>.
- KOHLER, N. E., TURNER, P. A., HOEY, J. J., NATANSON, L. J., BRIGGS, J. 2002. Tag and Recapture Data for Three Pelagic Shark species: Blue Shark (*Prionace glauca*), Shortfin Mako (*Isurus oxyrinchus*), and Porbeagle (*Lamna nasus*) in the North Atlantic Ocean. *Col. Vol. Sci. Pap. ICCAT*, 54 (4): 1231–1260.
- MARTIN, R. A. 1994. From Here to Maternity. Reefquest Centre for Shark Research. [www.elasmo-research.org](http://www.elasmo-research.org).
- STEVENS, J. 2000. *Prionace glauca*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. [www.iucnredlist.org](http://www.iucnredlist.org).
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Text: Richard Hurst.  
Illustrations: Marc Dando.

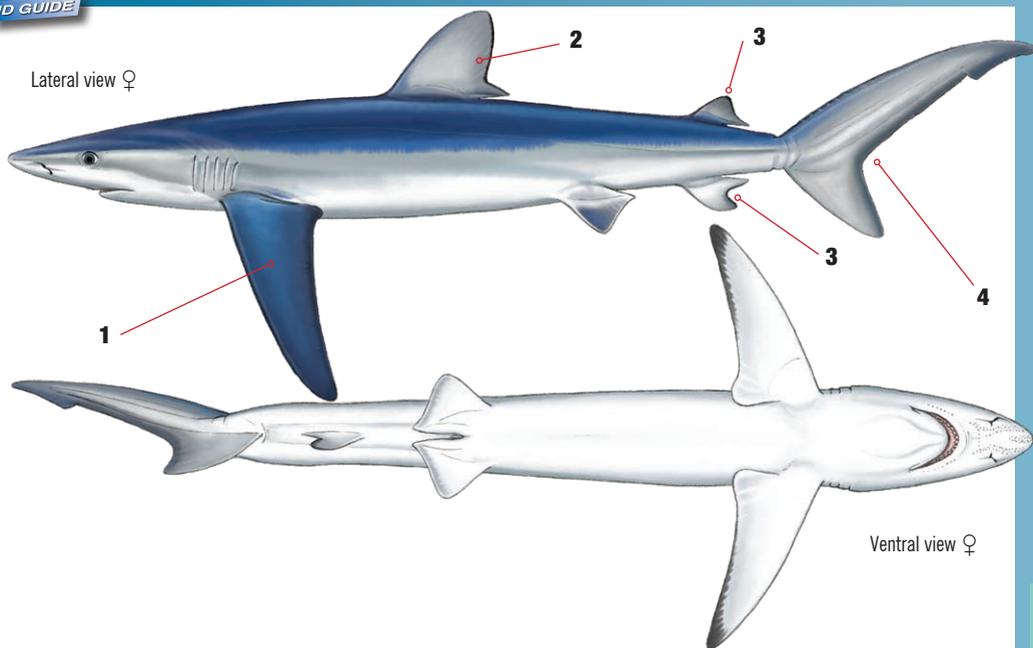
### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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## SCIENTIFIC NAME

*Prionace glauca* (Linnaeus, 1758).

## DISTRIBUTION

Circumglobal in temperate and tropical waters. Norway to South Africa in the East Atlantic<sup>iii</sup>.



## COMMON NAME

**BLUE SHARK**, Blue Dog, Blue Whaler, Peau Bleue (Fr), Tiburón Azul (Es), Tintoreta (Es).

## IDENTIFICATION

- 1 Pectoral fins long and curved.
- 2 First dorsal fin closer to pelvic fins than pectoral fins.
- 3 Second dorsal fin equal in size to and directly above anal fin.
- 4 Caudal fin asymmetrical.

## COLOUR

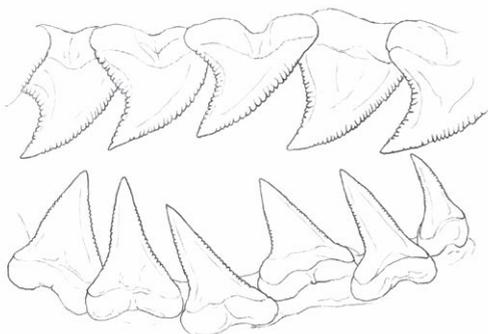
- Dark blue dorsally.
- Metallic blue on flanks.
- Pure white ventrally<sup>ii</sup>.

## BIOLOGY AND SIZE

- Born: 35–50cm. Mature: 221–323cm ♀, 182–291cm ♂. Max TL: 383cm<sup>iii</sup>.
- Litters of 4–135 pups have been recorded. Pups remain in inshore nursery areas for the first few years of life<sup>iii</sup>.
- An opportunistic feeder preying predominantly on pelagic teleost fish and cephalopods, although elasmobranchs, seabirds and cetaceans (possibly carrion) have been reported in diet<sup>iv</sup>.



## TEETH



- Upper teeth triangular and curved with serrated edges and overlapping bases.
- Symmetrical symphyseal tooth with 14 teeth either side.
- Lower teeth nearly symmetrical with fine serrations.
- 13–15 teeth either side<sup>i</sup>.

## SIMILAR SPECIES



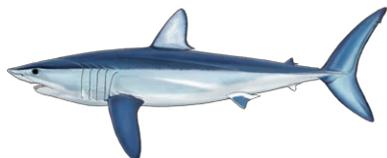
Prionace glauca, **Blue Shark**



Carcharhinus falciformis, **Silky Shark**



Lamna nasus, **Porbeagle Shark**



Isurus oxyrinchus, **Shortfin Mako Shark**



Isurus paucus, **Longfin Mako Shark**

## HABITAT

- Pelagic, surface to 600m. Prefer temperatures 12–20°C but known to tolerate 8–30°C<sup>ii</sup>.
- Undertake clockwise trans-Atlantic migrations. There is considered to be a single stock in the North Atlantic.
- Segregate by sex with females significantly more abundant at higher latitudes<sup>iii</sup>.

## CONSERVATION STATUS

- Widespread and abundant with a relatively high fecundity. However, it is thought to be the most heavily fished shark species and declines have been observed. As it is highly migratory, localised legislation is unlikely to benefit wider populations<sup>iv</sup>.
- Red List status:** Near Threatened (2000).

## COMMERCIAL IMPORTANCE

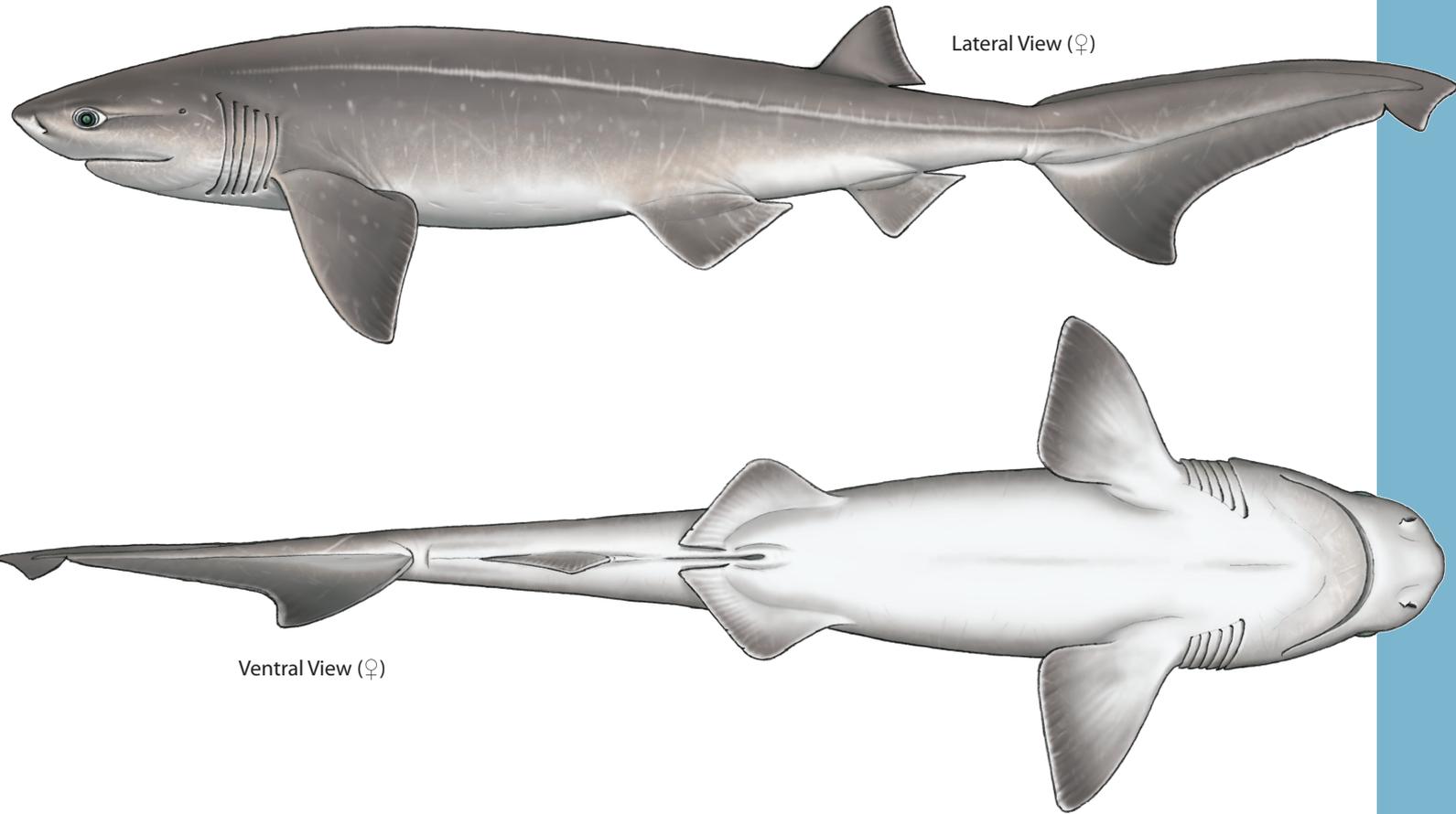
- Taken mainly as bycatch but high numbers are landed by Spanish and Portuguese pelagic fleets<sup>i</sup>.
- Fins are prized for the Asian fin trade market.
- Meat is eaten in southern Europe, most notably Spain.
- If landed whole, its meat can be used for human consumption, liver for oil, carcasses for fishmeal and hides for leather<sup>i</sup>.

## HANDLING

- Handle with care.
- Large shark with powerful jaws and sharp teeth.
- Abrasive skin.

## REFERENCES

- Compagno, L. J. V.; 1984. FAO.
- Cooper, P.; Unknown. FLMNH.
- Kohler, N. E. *et al.*; 2002. *Col. Vol. Sci. Pap. ICCAT*.
- Stevens, J.; 2000. IUCN Red List.



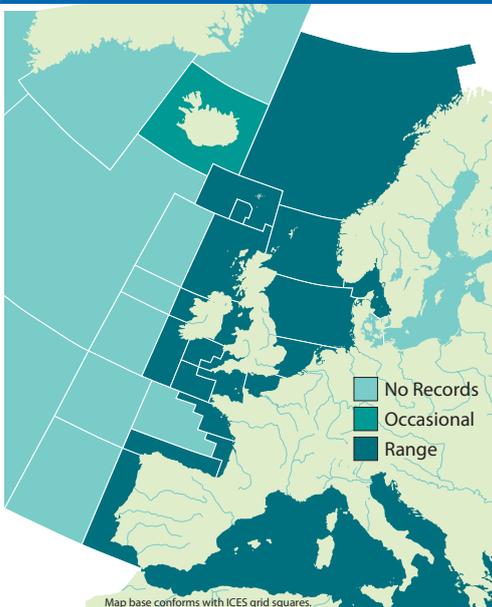
### COMMON NAMES

**Bluntnose Sixgill Shark**, Atlantic Mud Shark, Brown Shark, Bull Dog Shark, Bull Shark, Cow Shark, Gray Shark, Mud Shark, Sixgill Cow Shark, Requin Gris (Fr), Cañabota Gris (Es).

### SYNONYMS

*Squalus griseus* (Bonnaterre 1788), *Squalus vacca* (Bloch & Schneider 1801), *Notidanus monge* (Risso 1827), *Hexanchus corinum* (Jordan & Gilbert 1880), *Hexanchus corinus* (Jordan & Gilbert 1880), *Notidanus vulgaris* (Perez Canto 1886), *Hexanchus griseus australis* (de Buen 1960).

### DISTRIBUTION



The Bluntnose Sixgill Shark is found in tropical and temperate seas worldwide. In the east Atlantic it is known from Iceland and Norway to Namibia, including the Mediterranean Sea. It is also known from the west Atlantic, Pacific and Indian Oceans (Compagno, 1984).

### APPEARANCE

- Heavy bodied, broad headed shark with six gills.
- Single dorsal fin set well back behind pelvic fins.
- Well developed dorsal lobe of caudal fin.
- Wide, broadly rounded mouth.
- Six rows of large, comb-like teeth on each side of lower jaw.
- Rows of smaller, serrated, single-cusped teeth in upper jaw.
- Large, green eyes forward of mouth.
- Grey, olive or brown on dorsal surface. Paler ventrally.
- Light coloured stripe along each flank close to lateral line.
- Fins may have pale edges.

The Bluntnose Sixgill Shark is a large, well-built shark which is quite distinctive as only two other species have six gill slits in the northeast Atlantic, the Bigeye Sixgill Shark, *Hexanchus nakamurai*, and the Frilled Shark, *Chlamydoselachus anguineus*. It could be confused with the Bigeye Sixgill Shark but is much larger and more heavily built with a shorter, blunter snout and smaller eyes.

A single, small dorsal fin is present and set well back along the body, behind the pelvic fins. The pectoral fins have large bases and well rounded tips. The pelvic fins and anal fins are both well developed, comparable to the dorsal fin in size. The dorsal lobe of the caudal fin is large with a well developed terminal lobe and sub terminal notch. The ventral lobe is not particularly pronounced (Bester, Unknown).

## SIMILAR SPECIES

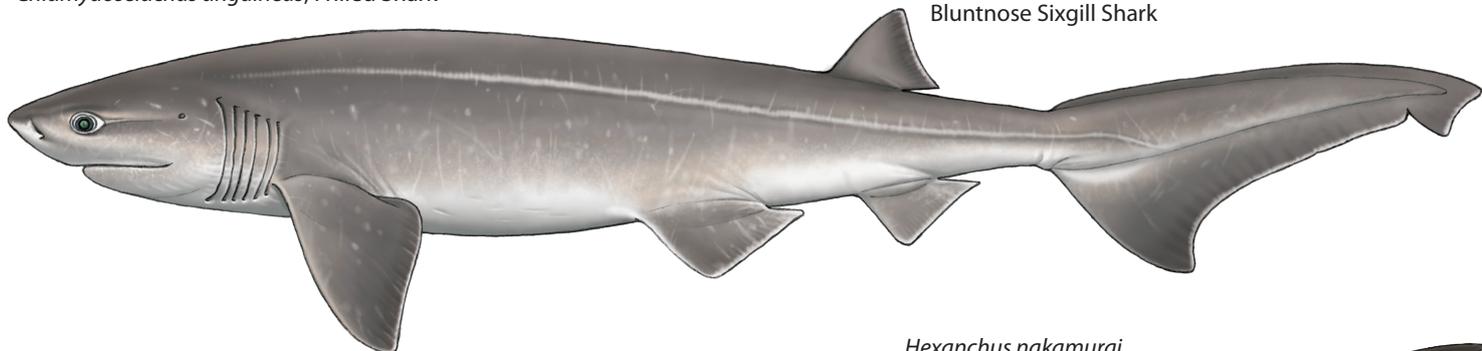
*Hexanchus nakamurai*, Bigeye Sixgill Shark

*Heptranchias perlo*, Sharpnose Sevengill Shark

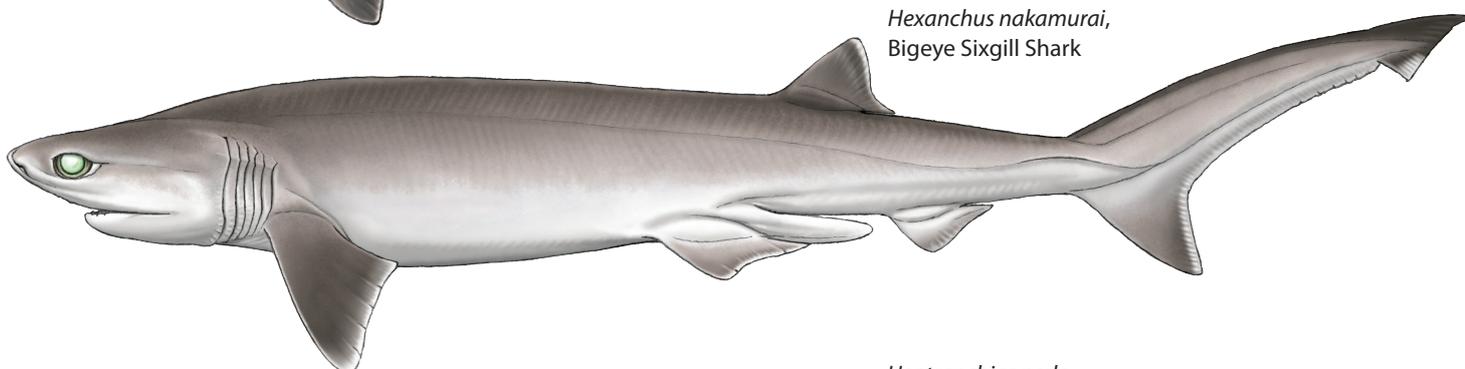
*Somniosus microcephalus*, Greenland Shark

*Chlamydoselachus anguineus*, Frilled Shark

*Hexanchus griseus*,  
Bluntnose Sixgill Shark



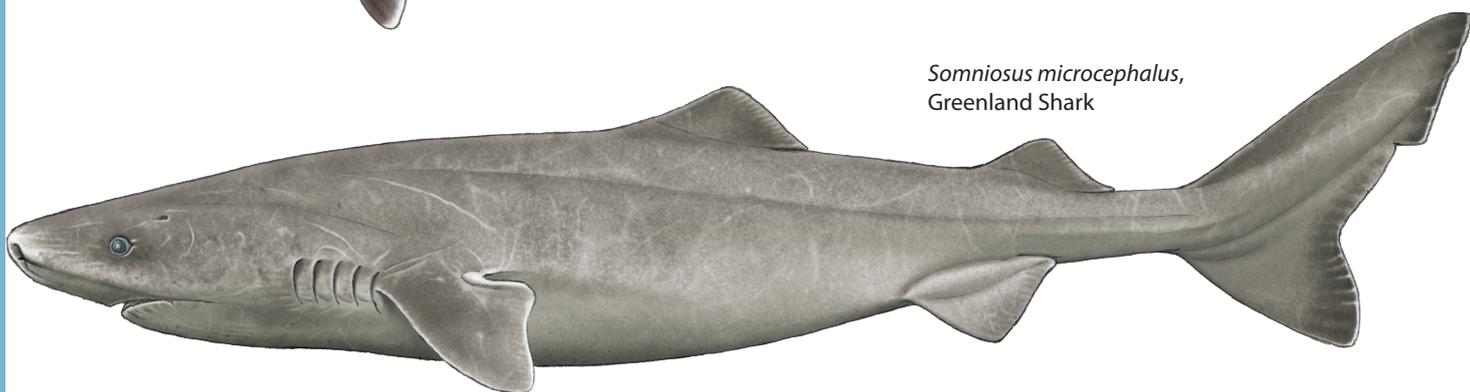
*Hexanchus nakamurai*,  
Bigeye Sixgill Shark



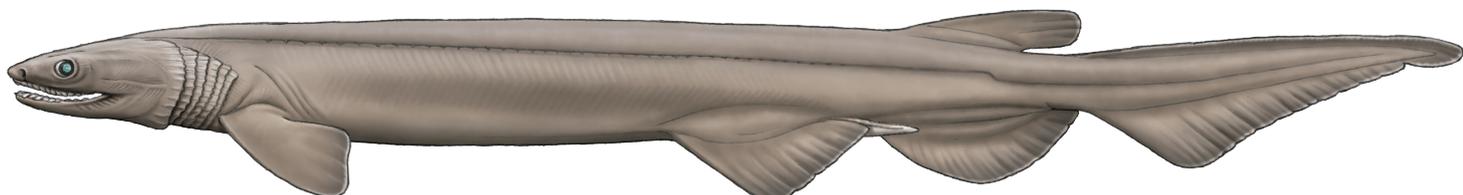
*Heptranchias perlo*,  
Sharpnose Sevengill Shark



*Somniosus microcephalus*,  
Greenland Shark



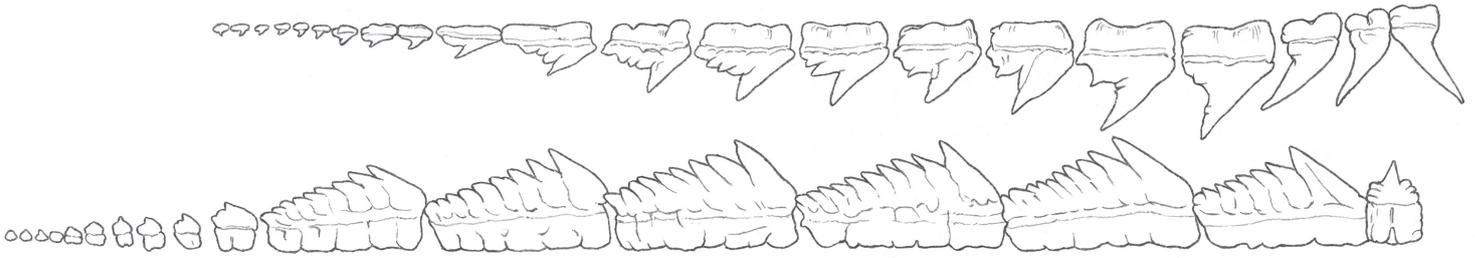
*Chlamydoselachus anguineus*,  
Frilled Shark



(Not to scale)

### TEETH

There are six rows of comb-like teeth either side of the symphyseal tooth in the lower jaw (Compagno, 1984). In the upper jaw there are nine smaller, serrated, single cusped teeth on either side (Bester, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

A deepwater shark, it is found to depths of 2,000 metres where it rests during the day. During the night it comes up to shallower waters to feed. Juveniles have been reported from close to the shore. Very little is known of the behaviour of the Bluntnose Sixgill Shark, although it appears to be a solitary animal (Bester, Unknown).

#### EGGCASE

N/A

#### DIET

The Bluntnose Sixgill Shark feeds nocturnally on a wide variety of prey including large bony fish such as dolphinfish, billfish, flounder, cod, hagfish and lampreys. It also preys on other elasmobranchs such as Spurdog (*Squalus acanthias*), Longnose Spurdog (*Squalus blainvillei*), Shortnose Spurdog (*Squalus megalops*), Prickly Sharks (*Echinorhinus cookei*), rays and chimaeras. It is also known to feed on snails, crabs, shrimps, squid and carrion such as seals, sea lions and whales (Compagno, 1984). Studies from eastern Sicilian waters showed that the most important prey items were teleost fish (60.87%), followed by cephalopods (13.04%), decapod crustaceans (8.7%), chondrichthyans (4.35%) and echinoderms (4.35%) (Kabasakal, 2004).

#### REPRODUCTION

Males mature at a total length of around 300cm, females at a total length of around 400cm. Best estimates put the age at maturity for males around 11–14 years, for females 18–35 years. An ovoviviparous species, the gestation period is unknown but is likely to be long. Litters can be extremely large with 22 to 108 pups. Each pup measures 60–75cm in length (Bester, Unknown).

## COMMERCIAL IMPORTANCE

The Bluntnose Sixgill Shark is fished both commercially and recreationally across its range using line gear, trawls, gillnets and traps. Its flesh is used for human consumption fresh, frozen and dried-salted. Its liver is used for oil and it is processed into fishmeal (Bester, Unknown).

Recently, reliable appearances of the species in shallow water off British Columbia and Washington State have started to attract interest from recreational divers. The British Columbia Dive Operators' Association has estimated that visiting divers inject \$5 -10,000,000 a year into the local economy (Martin, 1998).

## THREATS, CONSERVATION, LEGISLATION

The Bluntnose Sixgill Shark seems particularly vulnerable to overfishing and is unable to sustain healthy population levels when targeting fishing occurs. It is regularly taken as bycatch in fisheries targeting other deepwater sharks such as *Centrophorus* spp. Due to a lack of fisheries data across the majority of its range it is very difficult to quantify population declines in this species. There are no management plans in place for the conservation of the Bluntnose Sixgill Shark (Shark Specialist Group, 2000).

## IUCN RED LIST ASSESSMENT

Near Threatened (2000).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Powerful jaws and sharp teeth.
- Abrasive skin.

### REFERENCES

- BESTER, C. Unknown. Bluntnose Sixgill Shark. Florida Museum of Natural History. [www.flmnh.ufl.edu/fish/](http://www.flmnh.ufl.edu/fish/).
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- COOK, S. F., COMPAGNO, L. J. V. 2005. *Hexanchus griseus*. In: IUCN 2010. IUCN Red List of Threatened Species. [www.iucnredlist.org](http://www.iucnredlist.org).
- MARTIN, R. A. 1998. Swimming with Jurassic Sharks. Reefquest Centre for Shark Research. [www.elasmo-research.org](http://www.elasmo-research.org).
- KABASAKAL, H. 2004. Preliminary observations on the reproductive biology and diet of the Bluntnose sixgill shark, *Hexanchus griseus* (Bonnaterre, 1788) (Chondrichthyes: Hexanchidae), in Turkish Seas. *Acta Adriatica*, Vol. 45 (2): 187–196.
- SHARK SPECIALIST GROUP. 2000. *Hexanchus griseus*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. [www.iucnredlist.org](http://www.iucnredlist.org).

Text: Richard Hurst.  
Illustrations: Marc Dando.

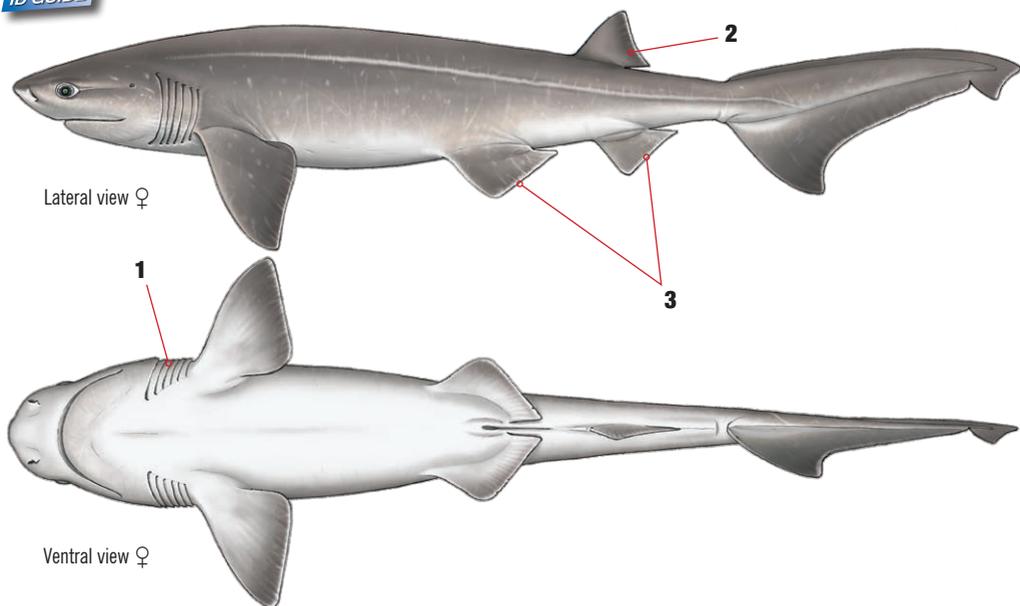
#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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Lateral view ♀

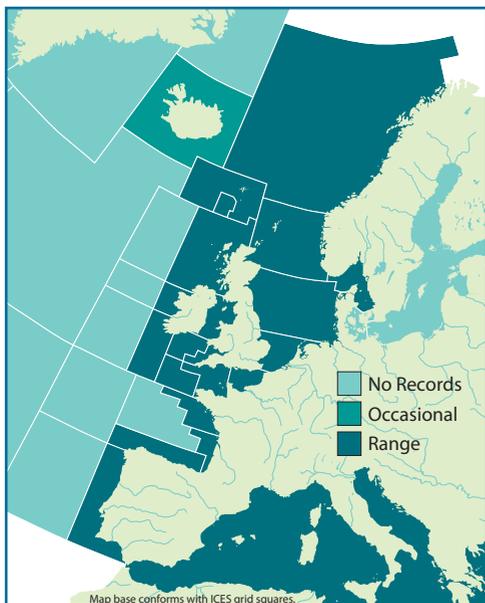
Ventral view ♀

## SCIENTIFIC NAME

*Hexanchus griseus* (Bonnaterre 1788).

## DISTRIBUTION

Circumglobal in tropical and temperate seas. East Atlantic from Iceland and Norway to Namibia, including the Mediterranean Sea<sup>ii</sup>.



## COMMON NAME

**BLUNTNOSE SIXGILL SHARK**, Atlantic Mud Shark, Brown Shark, Bull Dog Shark, Bull Shark, Cow Shark, Gray Shark, Mud Shark, Sixgill Cow Shark, Requin Grisét (Fr), Cañabota Gris (Es).

## IDENTIFICATION

- 1 Six gill slits.
- 2 Single dorsal fin set back over anal fin.
- 3 Large pelvic and anal fins<sup>i</sup>.

## COLOUR

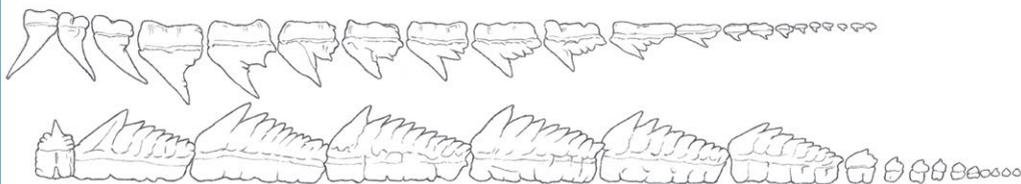
- Grey, olive or brown dorsally.
- Paler ventrally.
- Light stripe along flank.
- Fins may have pale margins<sup>i</sup>.

## BIOLOGY AND SIZE

- Born: 60–75cm. Mature: 400cm ♀, 300cm ♂<sup>i</sup>. Max TL: 482cm<sup>ii</sup>.
- Litters of 22–108 pups have been recorded<sup>i</sup>.
- Nocturnal feeder on a wide variety of teleost fish, elasmobranchs, molluscs, crustaceans and marine mammals (carrion)<sup>ii</sup>.



## TEETH



- ◉ Six rows of comb-like teeth either side of symphyseal tooth in lower jaw<sup>i</sup>.
- ◉ Nine teeth on each side of upper jaw, first two narrow cusped, wider to corners developing cusplets<sup>i</sup>.

## SIMILAR SPECIES



- ◉ *Hexanchus griseus*, **Bluntnose Sixgill Shark**



- ◉ *Heptranchias perlo*, **Sharpnose Sevengill Shark**



- ◉ *Hexanchus nakamurai*, **Bigeye Sixgill Shark**



- ◉ *Somniosus microcephalus*, **Greenland Shark**



- ◉ *Chlamydoselachus anguineus*, **Fritted Shark**

## HABITAT

- ◉ Juveniles can be found close to shore, adults to 2,000m. Deep inshore bays are used as nursery areas.
- ◉ Known to move into shallower waters at night to feed<sup>i</sup>.
- ◉ Regularly encountered by divers in areas of the northeast Pacific<sup>iii</sup>.

## CONSERVATION STATUS

- ◉ Particularly vulnerable to fishing pressure due to its large size and naturally low abundance. Little species specific landings data is available<sup>iv</sup>.
- ◉ **Red List status:** Near Threatened (2000).

## COMMERCIAL IMPORTANCE

- ◉ Fished commercially and recreationally using line gear, trawls, gillnets and traps.
- ◉ Flesh used for human consumption, liver for oil and carcass can be processed into fishmeal<sup>i</sup>.
- ◉ Recreational divers seeking this species are estimated to inject \$5-10 million to British Columbia annually<sup>iii</sup>.

## HANDLING

- ◉ Handle with care.
- ◉ Powerful jaws and sharp teeth.
- ◉ Abrasive skin.

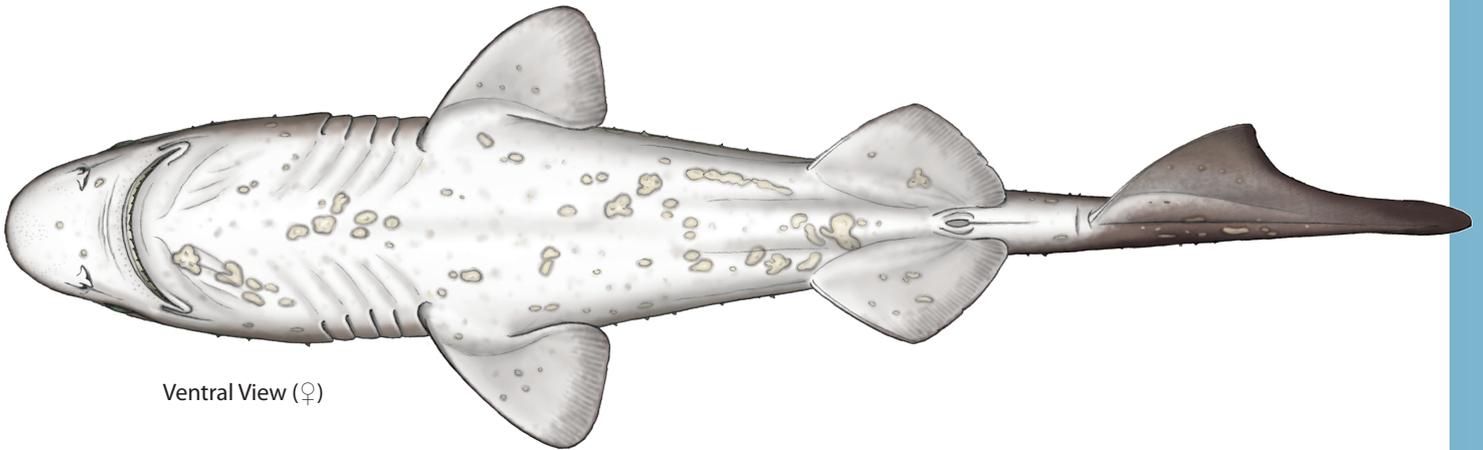
## REFERENCES

- Bester, C; Unknown. FLMNH.
- Compagno, L. J. V; 1984. FAO.
- Martin, R. A; 1998. ReefQuest Centre for Shark Research
- Species Survival Group; 2000. IUCN Red List.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Bramble Shark**, Spiny Shark, Spinous Shark, Squale Bouclé (Fr), Tiburón de Clavos (Es).

### SYNONYMS

*Squalus brucus* (Bonnaterre 1788), *Squalus spinosus* (Gmelin 1789), *Echinorhinus obesus* (Smith 1849), *Echinorhinus mccoysi* (Whitley 1931).

### DISTRIBUTION



In the east Atlantic the Bramble Shark can be encountered from the North Sea to the Ivory Coast, including the western Mediterranean. Further south it is known from Namibia to the Cape of Good Hope, South Africa. It is also found in the west Atlantic, the South Atlantic, the Pacific and the Indian Ocean (Bester and Burgess, Unknown).

### APPEARANCE

- Stout, soft and flabby body.
- Large, thorn-like denticles scattered across body.
- Dorsal fins close-set and far back with no associated spines.
- No anal fin.
- No sub-terminal notch on caudal fin.
- 310cm maximum total length.

The Bramble Shark is an extremely distinctive shark in the northeast Atlantic as it is covered in 'buckler' thorns. These have rounded bases and are often fused together to form large plates (15-25mm across) with multiple cusps (Bester and Burgess, Unknown). In addition, when freshly caught they are often covered in bad smelling mucus (Martin, Unknown). The snout is snort and blunt and the gill slits are large, especially the fifth. The dorsal fins are set extremely far back (both on the pre-caudal tail, first almost level with the pelvic fins) and are extremely close-set. There is no anal fin (Bester and Burgess, Unknown).

The Bramble Shark can be dark grey, olive, purple, black or brown with metallic reflections on the back and flanks. Occasionally it has darker blotches. Ventrally, it is pale brown to white. It reaches a maximum total length of 310cm (Bester and Burgess, Unknown).

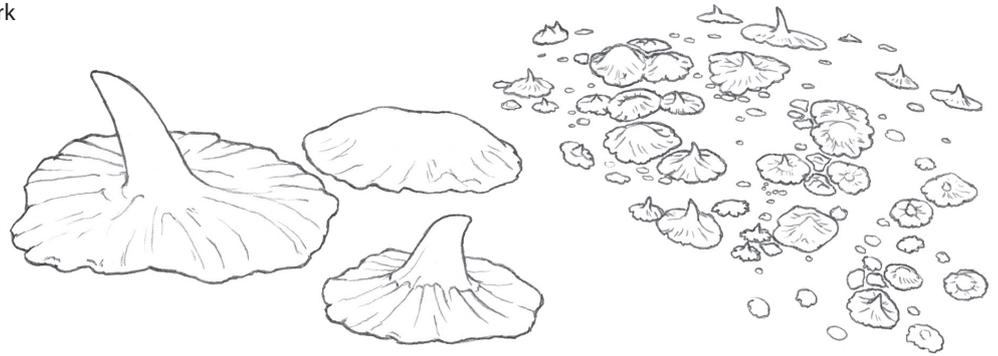
SIMILAR SPECIES

*Somniosus microcephalus*, Greenland Shark

*Somniosus rostratus*, Little Sleeper Shark

*Hexanchus griseus*, Bluntnose Sixgill Shark

Dermal Denticles of *Echinorhinus brucus*



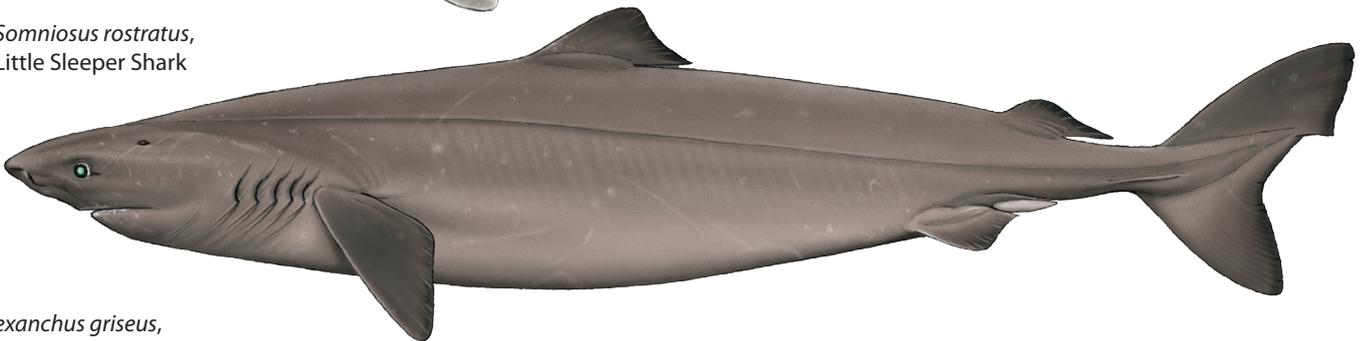
*Echinorhinus brucus*,  
Bramble Shark



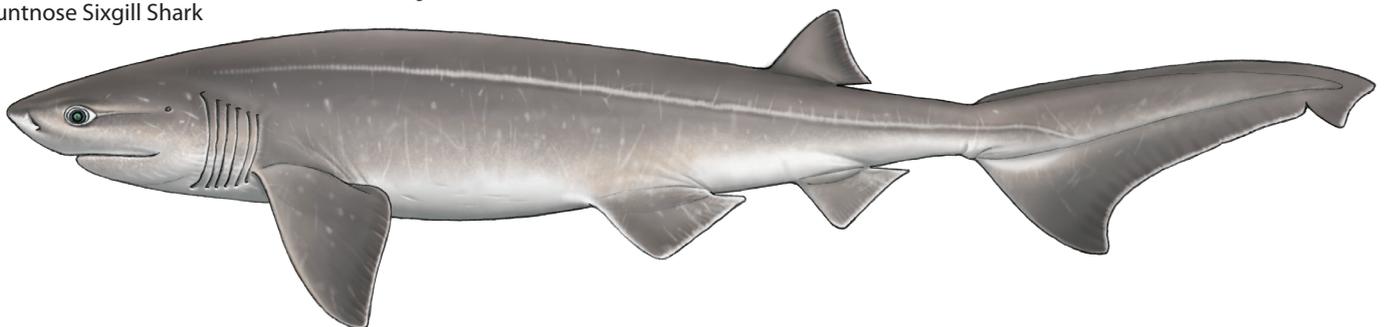
*Somniosus microcephalus*,  
Greenland Shark



*Somniosus rostratus*,  
Little Sleeper Shark



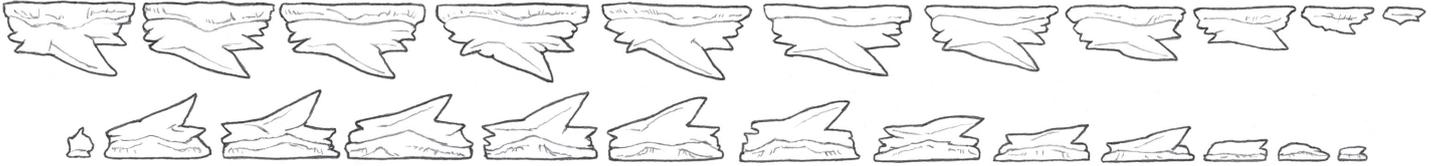
*Hexanchus griseus*,  
Bluntnose Sixgill Shark



(Not to scale)

### TEETH

The teeth are similar in both jaws. There is a single cusp and up to 3 cusplets on each tooth. These cusplets are absent in juveniles. There are 20–26 in the upper jaw, 22–26 in the lower jaw (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Bramble Shark is a deepwater, bottom-dwelling shark which is considered to be rather sluggish. It has been recorded from 18–900 metres but is most common below 200m (Bester and Burgess, Unknown).

#### EGGCASE

N/A

#### DIET

The diet of the Bramble Shark is poorly understood but is thought to consist of bony fish (Ling, Catfish and Lizardfish) and crustaceans, as well as smaller sharks (Spiny Dogfish, *Squalus acanthias*) (Compagno, 1984).

#### REPRODUCTION

Males are thought to mature at approximately 160cm in length, females at approximately 200cm in length (Paul, 2003). An ovoviparous species, females can have 15–24 pups per litter. Each of these is born measuring 40–50cm in length (Bester and Burgess, Unknown).

## COMMERCIAL IMPORTANCE

A relatively unimportant species. the Bramble Shark is caught in bottom trawls and on hand lines from the North Sea to Portugal and can be utilised for fish meal. The liver oil has traditional medicinal uses in South Africa (Compagno, 1984).

## THREATS, CONSERVATION, LEGISLATION

The Bramble Shark is an apparently rare deepwater shark that is recorded sporadically and usually singularly. It is speculated to occur at greater depths than are currently fished but this is yet to be proved. While little is known of its life history, it is likely to be slow growing, late maturing and have a low overall productivity. This low recruitment potential makes deep-sea sharks such as the Bramble Shark particularly vulnerable to fishing pressure and declines in the species have been recorded in the northeast Atlantic since the mid 1990's (Paul, 2003). There are currently no conservation actions or management plans in place for the Bramble Shark.

## IUCN RED LIST ASSESSMENT

Data Deficient (2003).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large, thorn-like denticles scattered over body.
- Sharp teeth.

### REFERENCES

- BESTER, C., BURGESS, G. Unknown. Bramble Shark. Florida Museum of Natural History. [www.flmnh.ufl.edu/fish/](http://www.flmnh.ufl.edu/fish/).
- COMPAGNO, L. J. V. 1984. Sharks of the World: An Annotated and Illustrated Catalogue of Shark Species Known to Date. Volume 4, Part 1. Hexanchiformes to Lamniformes. FAO. Rome, Italy.
- MARTIN, R. A. Unknown. Order Echinorhiniformes: Bramble Sharks – 2 Species. ReefQuest Centre for Shark Research. [www.elasmoresearch.org](http://www.elasmoresearch.org).
- PAUL, L. 2003. *Echinorhinus brucus*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. [www.iucnredlist.org](http://www.iucnredlist.org).

Text: Richard Hurst.  
Illustrations: Marc Dando.

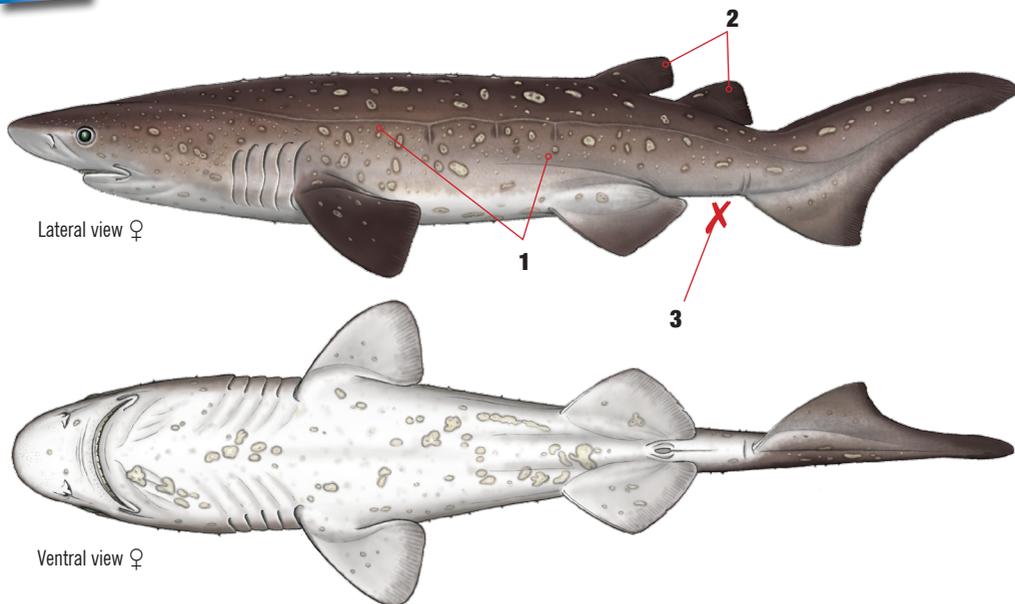
#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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Lateral view ♀

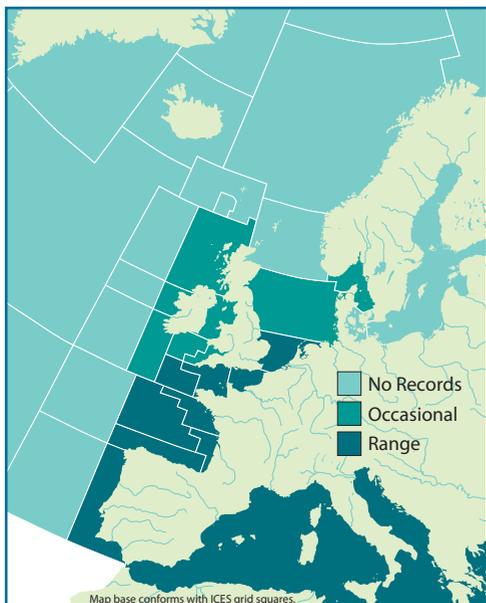
Ventral view ♀

## SCIENTIFIC NAME

*Echinorhinus brucus* (Bonnaterre 1788).

## DISTRIBUTION

Patchy worldwide distribution. Northeast Atlantic from the North Sea to the Ivory Coast, including the Mediterranean<sup>i</sup>.



## COMMON NAME

**BRAMBLE SHARK**, Spiny Shark, Spinous Shark, Squalo Bouclé (Fr), Tiburón de Clavos (Es).

## IDENTIFICATION

- 1 Large, thorn-like denticles scattered across body.
- 2 Close set dorsal fins with no spines.
- 3 No anal fin<sup>i</sup>.

## COLOUR

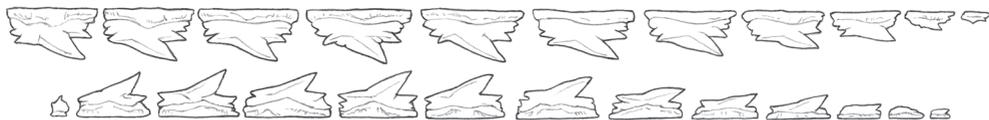
- From black through grey, brown, purple to olive dorsally.
- Metallic reflections on back and flanks.
- Pale brown, grey or white ventrally<sup>i</sup>.
- Can have dark or red spots on the back and sides.

## BIOLOGY AND SIZE

- Born: 40–50cm<sup>i</sup>. Mature: 200cm ♀, 160cm ♂<sup>iii</sup>. Max TL: 310cm<sup>i</sup>.
- Litters of 15–24 pups have been recorded<sup>i</sup>.
- Feeds on a variety of teleost fish, elasmobranchs and crustaceans<sup>ii</sup>.



## TEETH



- Similar in both jaws.
- Single cusp with up to three pairs of cusplets, absent in juveniles.
- 20–26 in upper jaw, 22–26 in lower jaw<sup>ii</sup>.

## SIMILAR SPECIES



- Echinorhinus brucus*, **Bramble Shark**



- Somniosus microcephalus*, **Greenland Shark**



- Somniosus rostratus*, **Little Sleeper Shark**



- Hexanchus griseus*, **Bluntnose Sixgill Shark**

## DERMAL DENTICLES



## HABITAT

- 18–900m, most common below 200m<sup>i</sup>.
- Usually demersal but may be found in the water column.
- Considered a sluggish shark but may be capable of short rushes to take prey<sup>iii</sup>.

## CONSERVATION STATUS

- Rare deepwater species recorded sporadically and usually singularly. Little is known of its life history but it is likely to be slow growing, late maturing and have few young<sup>iii</sup>.
- Red List status:** Data Deficient (2003).

## COMMERCIAL IMPORTANCE

- Relatively unimportant. Taken in bottom trawls and on hand lines.
- Usually discarded but if landed can be used for fishmeal.
- Its liver oil has traditional medicinal uses in South Africa<sup>ii</sup>.

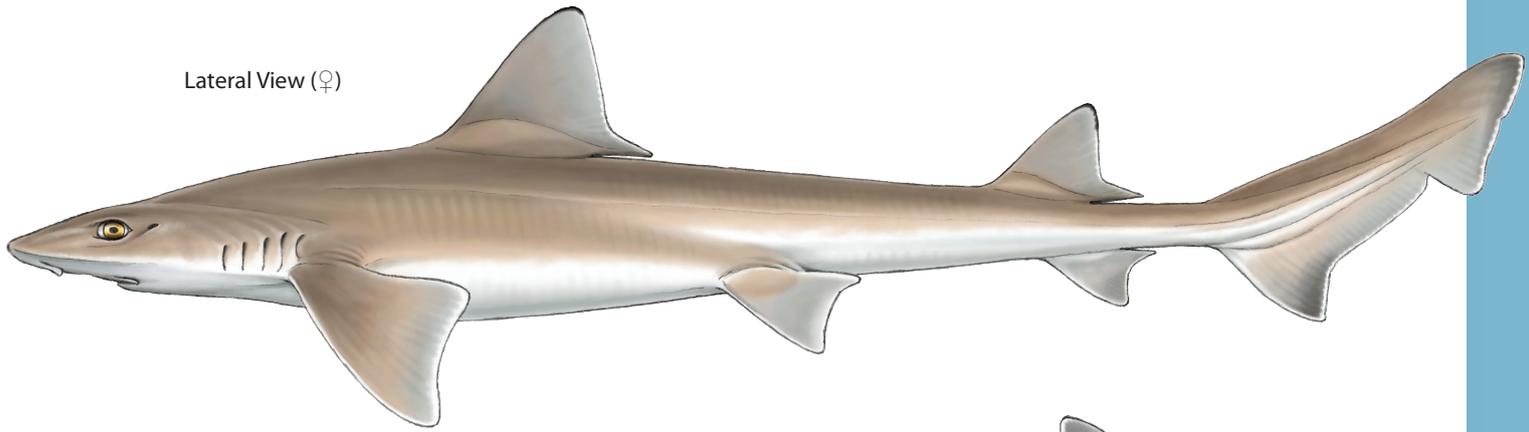
## HANDLING

- Handle with care.
- Large, thorn-like denticles scattered over body.
- Sharp teeth.

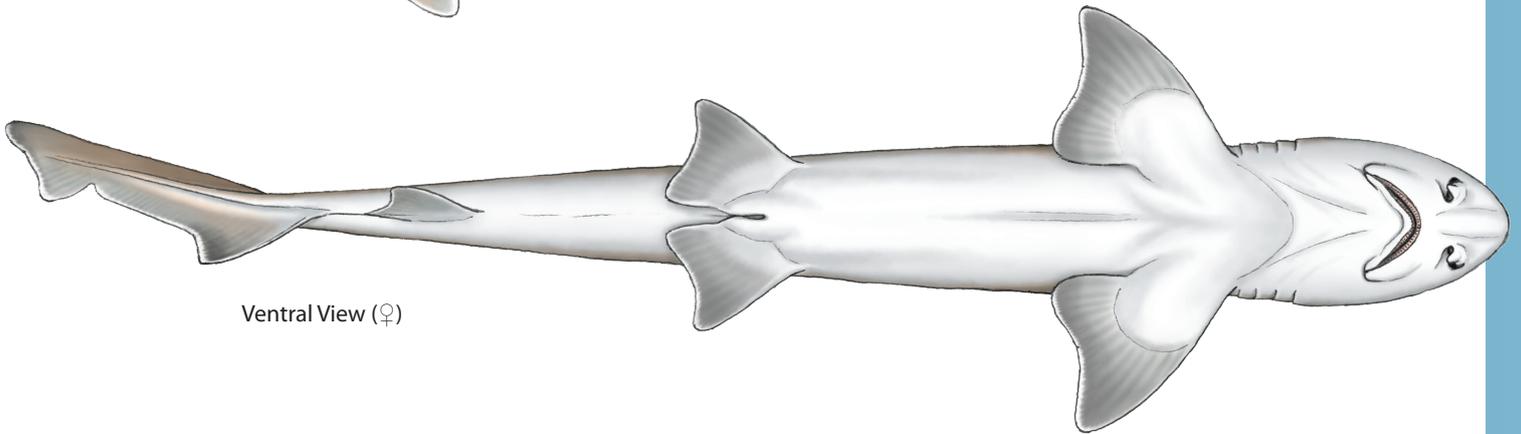
## REFERENCES

- Bester, C. *et al*; Unknown. FLMNH.
- Compagno, L. J. V.; 1984. FAO.
- Paul, L.; 2003. IUCN Red List.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

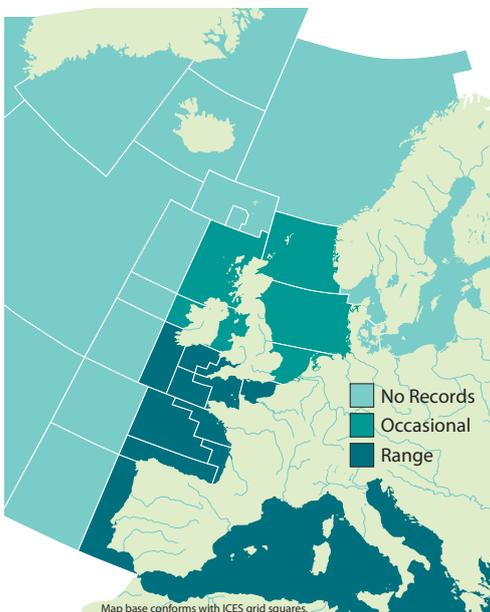
Common Smoothhound, Grey Mouth Dog, Common Houndshark, Smooth Dogfish, Sweet William, Emissole Lisse (Fr), Musola (Es).

### SYNONYMS

*Squalus mustelus* (Linnaeus, 1758), *Mustelus laevis* (Linck, 1790), *Mustelus vulgaris* (Cloquet, 1821), *Mustelus levis* (Risso, 1826), *Mustelus equestris* (Bonaparte, 1834).

### DISTRIBUTION

The range of the Common Smoothhound was until very recently believed to cover the northeast Atlantic from the British Isles



to Madeira and the Canary Isles, including the Mediterranean Sea (Compagno, 1984). Genetic studies are beginning to show that confusion with the Starry Smoothhound, *Mustelus asterias*, could have led to an overestimate of its range (Farrell *et al.*, 2009). It is also known from South Africa (Compagno, 1984).

Map base conforms with ICES grid squares.

### APPEARANCE

- Dorsal fins large and prominent, the first larger than the second.
- First dorsal fin originates over pectoral free tips.
- No dorsal spines.
- Large pectoral fins.
- Anal fin present.
- Large dorsal caudal lobe with large subterminal notch and lobe.
- Grey or grey-brown dorsally.
- Ventrally light.

The Common Smoothhound is a slender species with two large, prominent dorsal fins, the first larger than the second. The first dorsal fin originates over the base of the pectoral fins, the second just forward of the anal fin. There are no dorsal spines and the free rear tips are small. The dorsal caudal lobe is large with a strong terminal notch and lobe. It can be an easily identifiable species as it is the only member of the *Mustelus* genus without white or black spots in European waters. However, on the Starry Smoothhound, *Mustelus asterias*, these spots can be faded or completely absent meaning that any *Mustelus* spp. with no white spots cannot automatically be attributed to the Common Smoothhound (Farrell *et al.*, 2009).

Positive identification can be made physically in 3 ways. Firstly, buccopharyngeal denticles cover the entire palate and floor of the mouth in the Starry Smoothhound but only the tongue tip and extreme anterior end of the palate in the Common Smoothhound. Secondly, the longitudinal ridges of the dermal denticles extend only half way along their length in the Starry Smoothhound, whereas in the Common Smoothhound they extend along their entire length (Compagno, 1984). Lastly, the connection between the female and the embryo is different between the species. None of these methods

## APPEARANCE CONTINUED

are particularly useful for live specimens or large numbers of sharks. The last in particular only works for gravid females landed whole. Genetic identification methods are therefore becoming more widespread (Farrell *et al.*, 2009).

Amongst similar species from different genus, it can be distinguished from the Tope Shark, *Galeorhinus galeus*, by the large second dorsal fin (larger than the anal fin) and from the Spiny Dogfish, *Squalus acanthias*, by the presence of an anal fin and absence of dorsal spines (Compagno, 1984).

## SIMILAR SPECIES

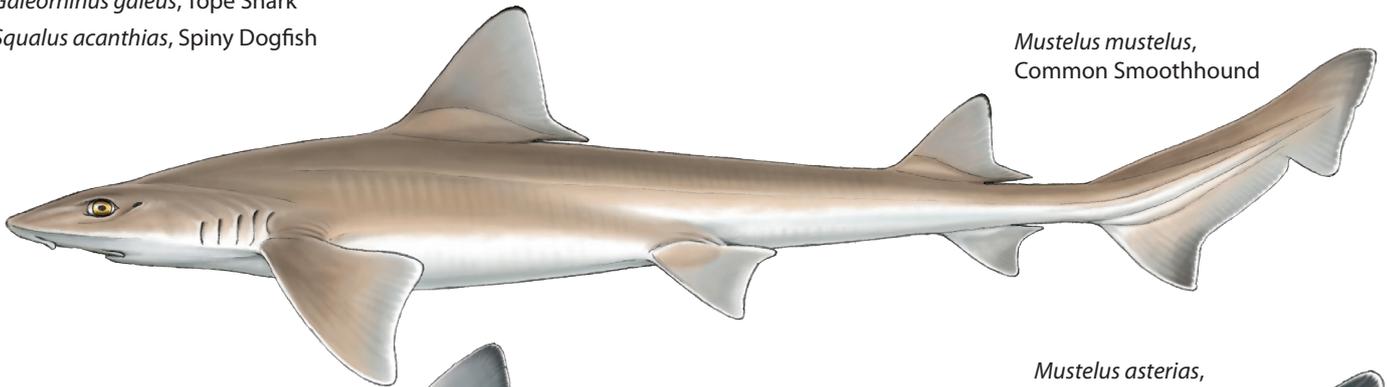
*Mustelus asterias*, Starry Smoothhound

*Mustelus punctulatus*, Blackspotted Smoothhound

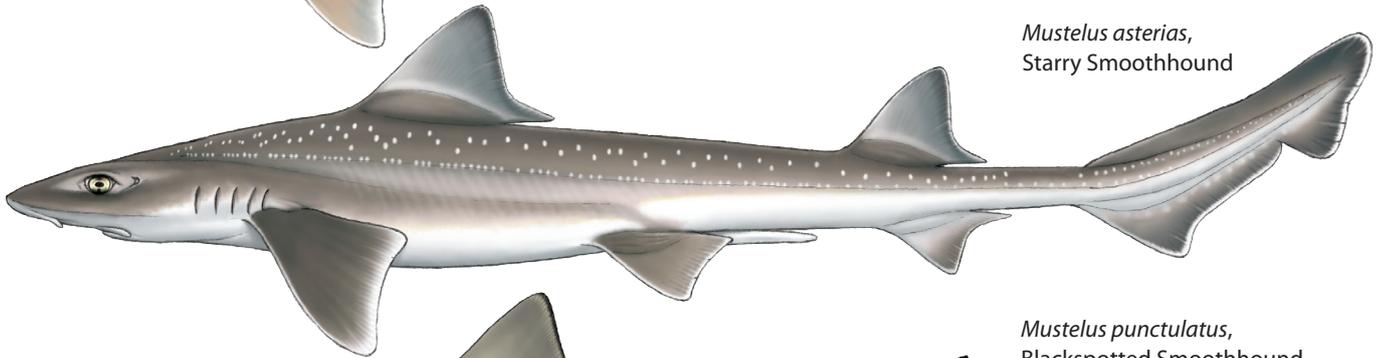
*Galeorhinus galeus*, Tope Shark

*Squalus acanthias*, Spiny Dogfish

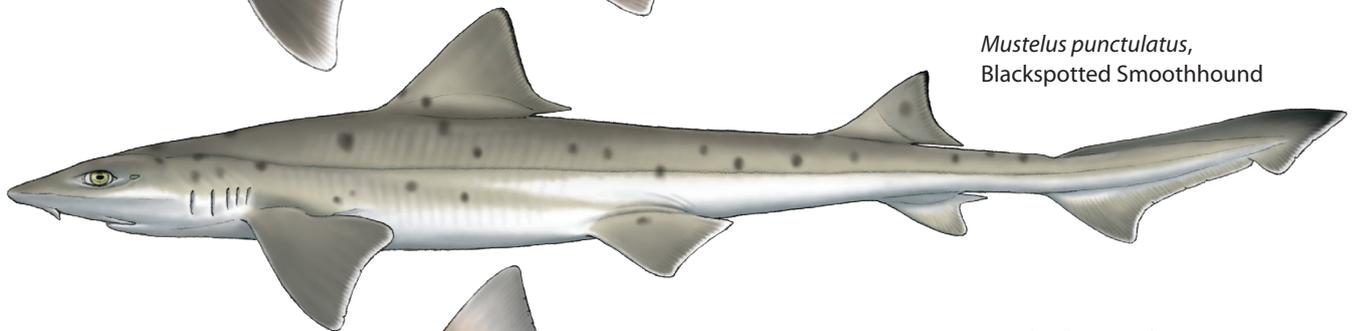
*Mustelus mustelus*,  
Common Smoothhound



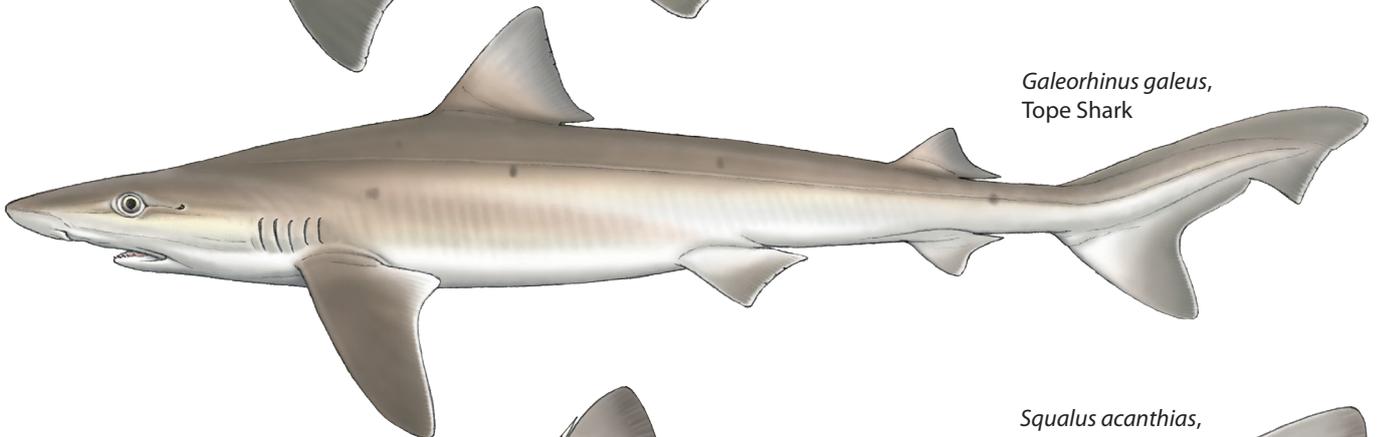
*Mustelus asterias*,  
Starry Smoothhound



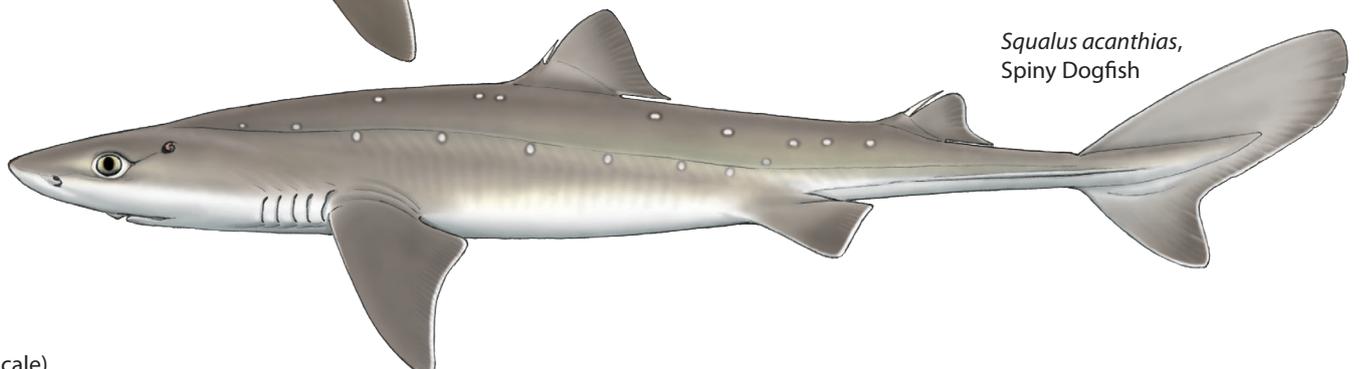
*Mustelus punctulatus*,  
Blackspotted Smoothhound



*Galeorhinus galeus*,  
Tope Shark



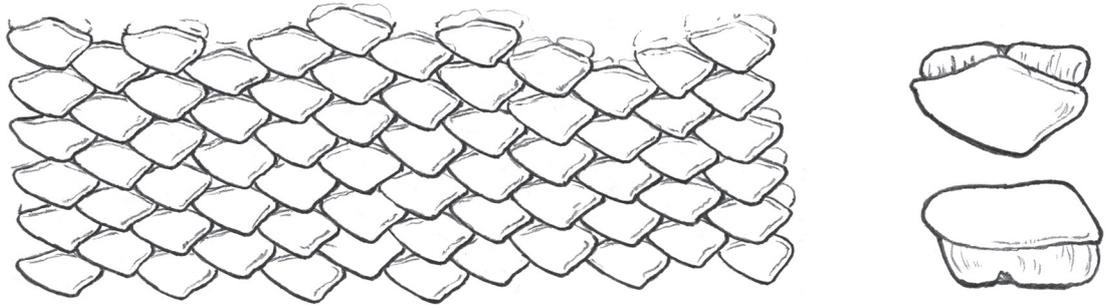
*Squalus acanthias*,  
Spiny Dogfish



(Not to scale)

### TEETH

The teeth are asymmetric with the cusps reduced to a low point. Very young individuals may have cusplets (Compagno, 1984). The tongue tip and extreme anterior palate are covered in buccopharyngeal denticles (Farrell *et al.*, 2009).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Common Smoothhound can be found to at least 350m on continental shelves and the uppermost slopes. It is most usually found on or near the bottom from 5–50m but can be found swimming mid-water (Compagno, 1984). It is predominantly an inshore species found around tidal flats, estuary mouths and in shallow bays with sandy, muddy or gravel substrate. It has been recorded offshore, often associated with sand banks and other topographical features (Fakhoury and Fergusson, Unknown).

#### EGGCASE

N/A

#### DIET

The most important prey items for the Common Smoothhound are benthic crustaceans including hermit and other crabs, lobster and shrimp. It also feeds on cephalopods and small bony fish (Fakhoury and Fergusson, Unknown). An individual caught at 300m had a mid-water fish (*Chlorophthalmus* spp.) in its stomach (Compagno, 1984).

#### REPRODUCTION

Male Common Smoothhounds mature around 70–74cm in length, females around 80cm. It is a viviparous species with a yolk sac placenta. After a gestation period of 10 to 11 months it gives birth to 4–15 young, each measuring around 39cm in length (Compagno, 1984).

## COMMERCIAL IMPORTANCE

Smoothhound sharks are of little interest to fisheries in northern Europe. They are targeted throughout the Mediterranean however as their flesh is appreciated in southern Europe (Farrell et al., 2009). The Common Smoothhound is taken as bycatch in mixed species trawls, longline fisheries and occasional by pelagic fishers using trawls and driftnets. If landed in northern Europe, the flesh can be utilised fresh and frozen for human consumption (mainly in France and Germany), the liver can be processed for its oil and the carcass can be used for fishmeal (Compagno, 1984).

## THREATS, CONSERVATION, LEGISLATION

The Common Smoothhound is a widespread although not abundant species. It is taken as bycatch in trawl and gillnet fisheries but there does not appear to be any immediate threat from overexploitation in the Atlantic (Ellis, 2000). In the Mediterranean, smoothhounds are targeted for their flesh so it could be under more intensive fishing pressure there (Aldebert, 1997). Catch trends should be monitored carefully to ascertain if it is being overexploited in this region.

## IUCN RED LIST ASSESSMENT

Least Concern (2000).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth and powerful jaws.
- Abrasive skin.

### REFERENCES

- ALDEBERT, Y. 1997. Demersal resources of the Gulf of Lions (NW Mediterranean). Impact of exploitation on fish diversity. *Vie et Milieu*. Vol. 47 (4): 275–284.
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- ELLIS, J. 2000. *Mustelus mustelus*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. [www.iucnredlist.org](http://www.iucnredlist.org).
- FAKHOURY, F., FERGUSSON, I. K. Unknown. Smoothhound (*Mustelus mustelus*). Mediterranean Shark Site. [www.sharks-med.netfirms.com](http://www.sharks-med.netfirms.com).
- FARRELL, E. D., CLARKE, M. W., MARIANI, S. 2009. Short Communication. A Simple Genetic Identification Method for Northeast Atlantic Smoothhound Sharks (*Mustelus* spp.). *ICES Journal of Marine Science*. Vol. 66 (3): 561–565.

Text: Richard Hurst.  
Illustrations: Marc Dando.

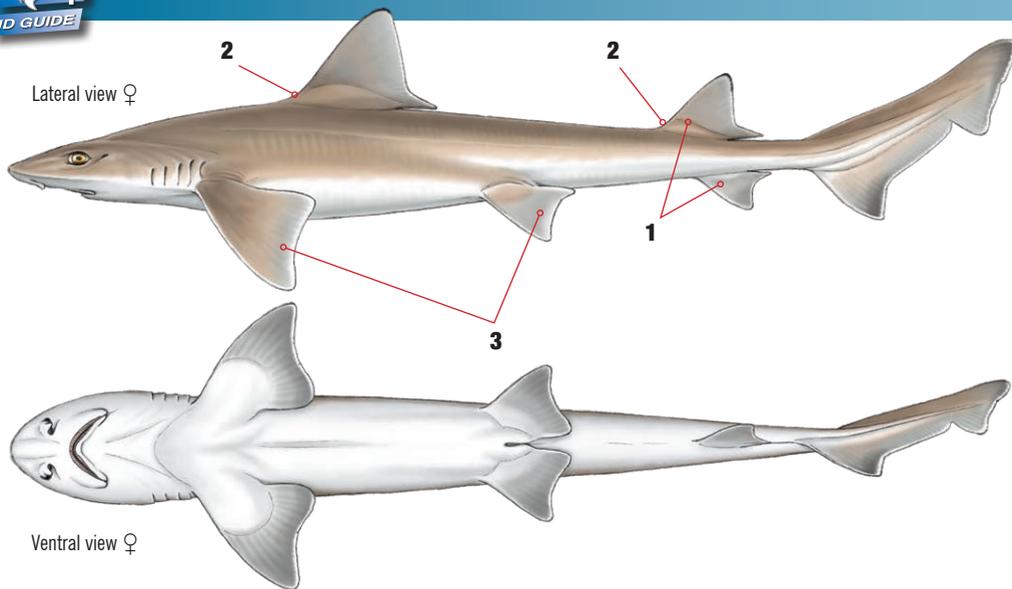
#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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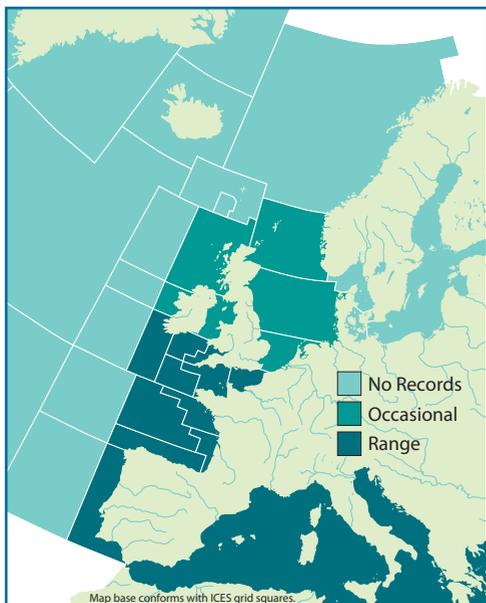


## SCIENTIFIC NAME

*Mustelus mustelus* (Linnaeus, 1758).

## DISTRIBUTION

Northeast Atlantic from the British Isles to Madeira and the Canary Isles, including the Mediterranean<sup>ii</sup>. Possible overestimate of northward range due to confusion with Starry Smoothhound, *Mustelus asterias*<sup>v</sup>.



## COMMON NAME

**COMMON SMOOTHHOUND**, Grey Mouth Dog, Common Houndshark, Smooth Dogfish, Sweet William, Emissole Lisse (Fr), Musola (Es).

## IDENTIFICATION

- 1 Second dorsal fin much larger than anal fin.
- 2 No dorsal spines.
- 3 Large pectoral and pelvic fins<sup>ii</sup>.

## COLOUR

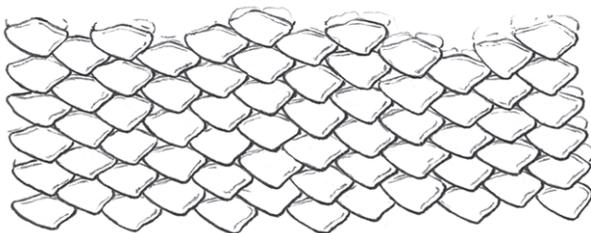
- Grey or grey brown dorsally.
- No white spots, some specimens with dark spots.
- Lighter to white ventrally<sup>ii</sup>.

## BIOLOGY AND SIZE

- Born: 39cm. Mature: 80cm ♀, 70–74cm ♂. Max TL: 164cm<sup>ii</sup>.
- Viviparous with yolk-sac placenta, litters of 4–15 young have been reported after a 10–11 month gestation period<sup>i</sup>.
- Benthic crustaceans most important prey item. Also feed on cephalopods and bony fish<sup>iv</sup>. Mid-water teleost species have been reported in stomach contents<sup>ii</sup>.

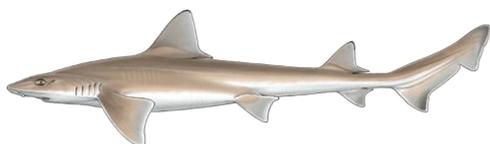


## TEETH



- Asymmetric with cusps reduced to a low point.
- Very young may have cusplets<sup>ii</sup>.
- Denticles only on tongue tip and front of palate<sup>v</sup>.

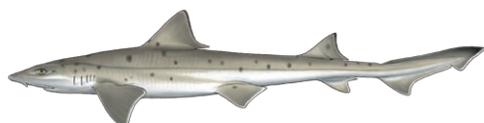
## SIMILAR SPECIES



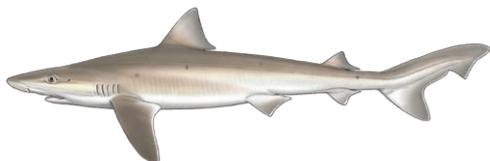
- Mustelus mustelus*, **Common Smoothhound**



- Mustelus asterias*, **Starry Smoothhound**



- Mustelus punctulatus*, **Blackspotted Smoothhound**



- Galeorhinus galeus*, **Tope**



- Squalus acanthias*, **Spiny Dogfish**

## HABITAT

- From shallows to at least 350m, most common 5–50m.
- Usually demersal but can be found mid-water<sup>i</sup>.
- Has been recorded offshore, often associated with features such as sandbanks<sup>iv</sup>.

## CONSERVATION STATUS

- Widespread but not abundant. Under little pressure in the Atlantic but fished in the Mediterranean<sup>iii</sup>.
- Red List status:** Vulnerable (2009).

## COMMERCIAL IMPORTANCE

- Of little importance in northern Europe. Flesh sometimes eaten in Germany and France<sup>ii</sup>.
- Targeted in the Mediterranean. Flesh prized in southern Europe<sup>i</sup>.
- Taken by benthic trawl, driftnet and line gear. Occasionally taken by pelagic trawls and driftnets<sup>i</sup>.
- Popular with recreational anglers and can be caught from the shore.

## HANDLING

- Handle with care.
- Crushing teeth and powerful jaws.
- Abrasive skin.

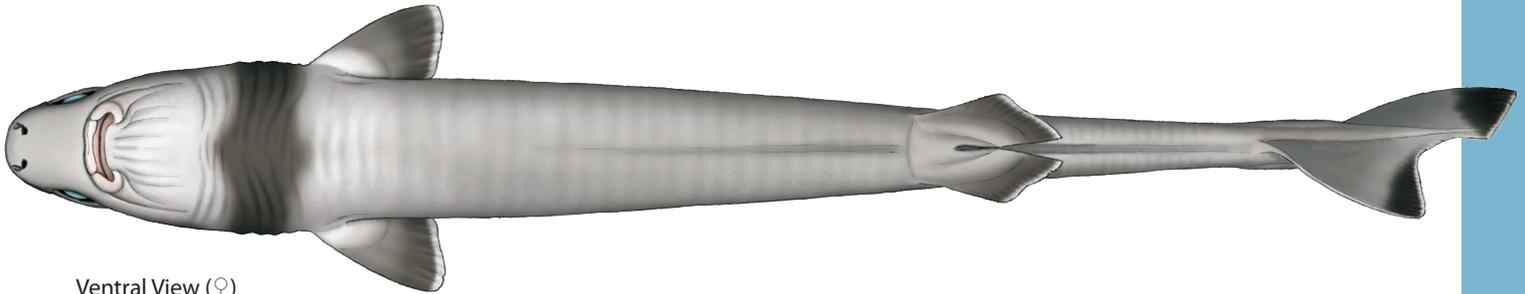
## REFERENCES

- Anonymous; 2007. TRAFFIC.
- Compagno, L. J. V.; 1984. FAO.
- Ellis, J. R.; 2000. IUCN Red List.
- Fakhoury, F. *et al*; Unknown. Shark Trust.
- Farrell, E. D. *et al*; 2009. ICES JMS.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

Cookiecutter Shark, Cigar Shark, Luminous Shark, Squalolet Féroce (Fr), Tollo Cigaro (Es).

### SYNONYMS

*Scymnus brasiliensis* (Quoy & Gaimard, 1824), *Squalus fulgens* (Bennett, 1840), *Scymnus torquatus* (Valenciennes, in Müller & Henle, 1839), *Scymnus unicolor* (Valenciennes, in Müller & Henle, 1839), *Leius ferox* (Kner, 1865).

### DISTRIBUTION

Primarily an oceanic species, the Cookiecutter Shark is found throughout the tropical Atlantic, Pacific and Indian Oceans. It has been found in temperate regions of the South Atlantic and South Pacific Oceans and its occurrence in the temperate North Atlantic has been inferred from fresh wounds on pelagic catches (primarily *Xiphias gladius*) off northwest Africa. There is a single record from Madeira (Muñoz-Chápuli *et al.*, 1988).



### APPEARANCE

- Cigar-shaped body.
- Two equal-sized, spineless dorsal fins set well back on the body.
- No anal fin.
- Short, bulbous snout with suckorial lips.
- Nearly symmetrical caudal fin with long ventral lobe.
- Huge, triangular-cusped lower teeth in 25–31 rows.
- Dark brown dorsally, lighter ventrally.
- Distinct dark collar around the gill region.
- Ventral surface covered in photophores.

A relatively small, cigar-shaped species, the Cookiecutter Shark has two small, spineless dorsal fins set well posterior on the back and no anal fin. The caudal fin is almost homocercal with a long ventral lobe. The snout is short and bulbous with obvious suckorial lips. The lower teeth are huge, single-cusped, triangular and arranged into 25–31 rows (Compagno, 1984).

The dorsal surface is dark brown, fading ventrally. While there may be a dark patch under the gills on the Bigtooth Cookiecutter Shark, *Isistius plutodus*, the Cookiecutter Shark has a distinct dark collar all around the gill region. With the exception of this collar, the entire ventral surface is covered in photophores which reportedly produce light for up to three hours after death (Bester, Unknown).

## SIMILAR SPECIES

*Isistius plutodus*, Bigtooth Cookiecutter Shark

*Etmopterus princeps*, Great Lanternshark

*Etmopterus pusillus*, Smooth Lanternshark

*Etmopterus spinax*, Velvet Belly Lanternshark

*Centroscyllium fabricii*, Black Dogfish

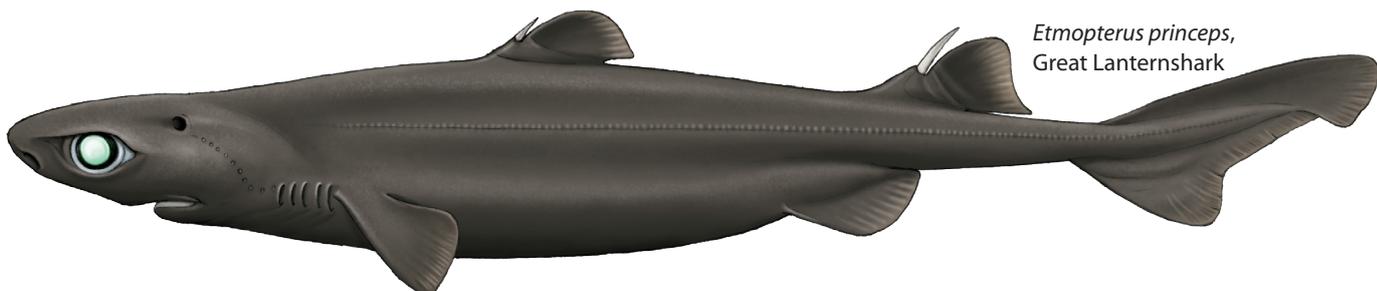
*Isistius brasiliensis*,  
Cookiecutter Shark



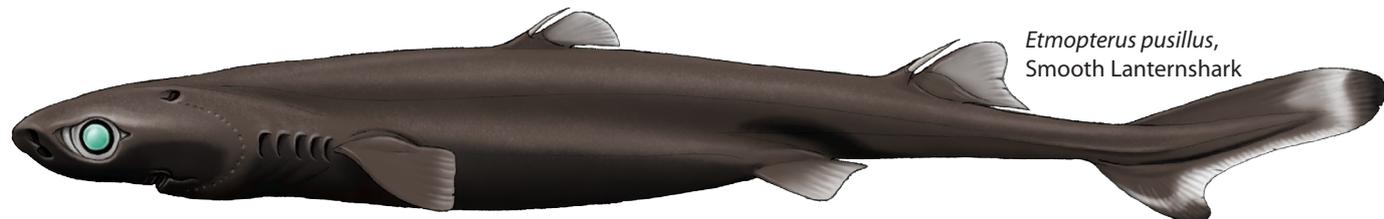
*Isistius plutodus*,  
Largetooth Cookiecutter Shark



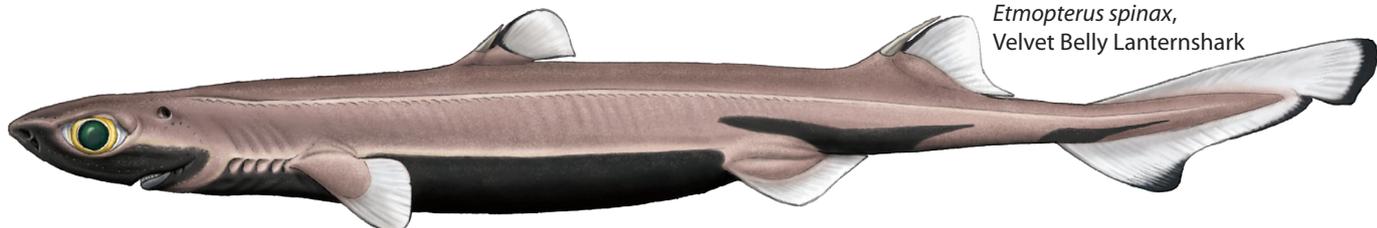
*Etmopterus princeps*,  
Great Lanternshark



*Etmopterus pusillus*,  
Smooth Lanternshark



*Etmopterus spinax*,  
Velvet Belly Lanternshark



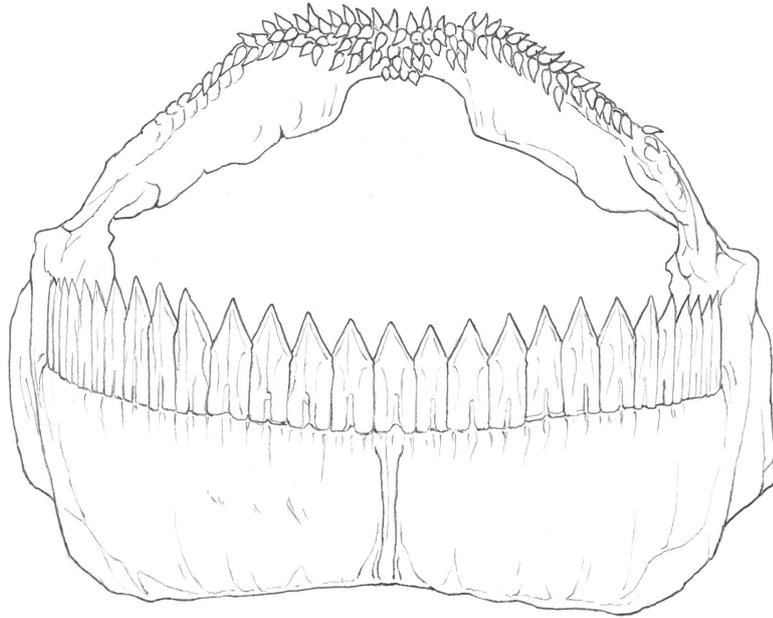
*Centroscyllium fabricii*,  
Black Dogfish



(Not to scale)

### TEETH

There are 30–37 small, erect teeth in the upper jaw and 25–31 triangular cusped teeth in the lower jaw (Bester, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

An epipelagic to bathypelagic species, the Cookiecutter Shark is generally caught at night, sometimes at the surface but most usually between 85 and 3,500m. Its preferred depth range and maximum depth are unknown. Like many deep sea species it is a vertical migrator, moving towards the surface at night to feed and dropping back down during the day. It may travel 2,000-3,000m a day in this manner (Compagno, 1984).

#### EGGCASE

N/A

### DIET

The Cookiecutter Shark is an ectoparasite which uses its bioluminescence to lure large pelagic species before carving a conical plug of flesh from them with its highly specialised dentition and suckorial lips. Known victims of this method of feeding include marlin, albacore, wahoo, dolphinfishes, cetaceans and the Megamouth Shark, *Megachasma pelagios*. More conventional prey include squid, gonostomatids and crustaceans (Compagno, 1984).

### REPRODUCTION

Female Cookiecutter Sharks mature at around 40cm in length, males at around 35cm in length. It is an ovoviviparous species giving birth to litters of 6–12 pups. Nothing more is known of the reproductive biology of the species. It is thought that oceanic islands are used as nursery areas (Bester, Unknown).

## COMMERCIAL IMPORTANCE

Due to its small size and naturally low abundance, the Cookiecutter Shark is rarely taken by fisheries and is generally discarded if caught (Stevens, 2003).

## THREATS, CONSERVATION, LEGISLATION

A widespread but patchily distributed species, the Cookiecutter Shark is too small to be regularly taken by fisheries and there are no significant threats to the species at present. The lack of knowledge of its biology and its presumed low fecundity mean that catches should be carefully monitored to detect any population changes (Stevens, 2003).

## IUCN RED LIST ASSESSMENT

Least Concern (2003).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large, sharp teeth.
- Abrasive skin.

### REFERENCES

- BESTER, C. Unknown. Cookiecutter Shark. Florida Museum of Natural History. [www.flmnh.ufl.edu/fish/](http://www.flmnh.ufl.edu/fish/).
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- STEVENS, J. 2003. *Isistius brasiliensis*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.1. [www.iucnredlist.org](http://www.iucnredlist.org).

Text: Richard Hurst.  
Illustrations: Marc Dando.

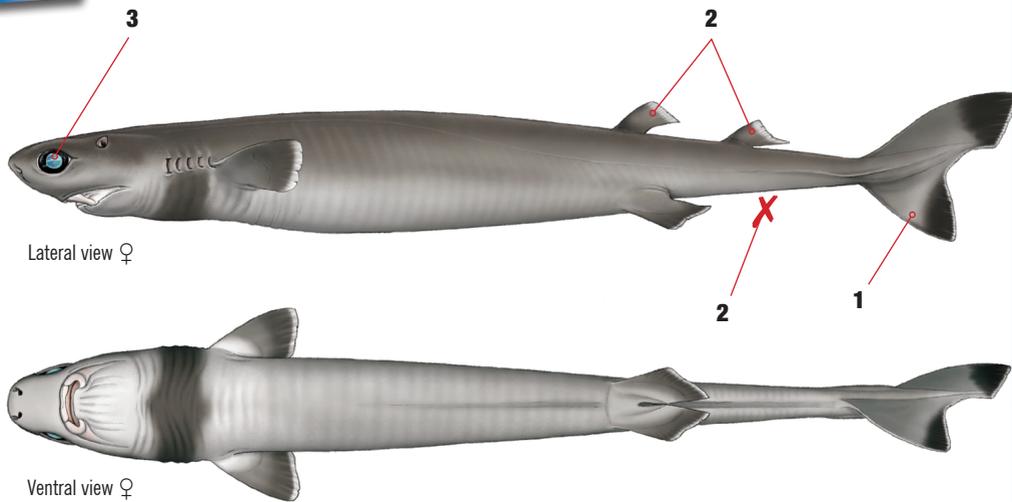
#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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Lateral view ♀

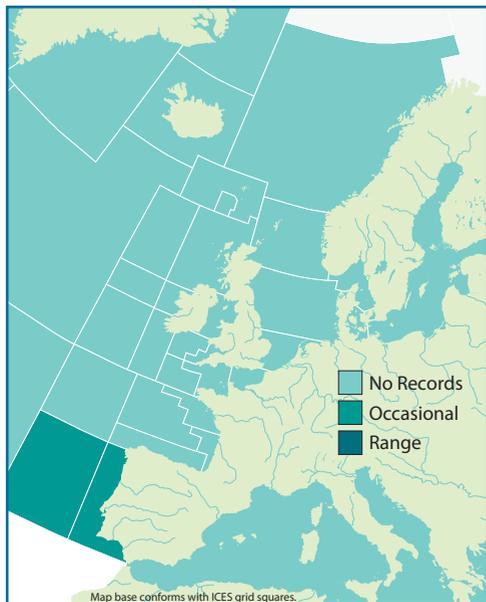
Ventral view ♀

## SCIENTIFIC NAME

*Isistius brasiliensis* (Quoy & Gaimard, 1824).

## DISTRIBUTION

Oceanic and circumtropical. East Atlantic from the Cape Verde Islands, Guinea and Sierra Leone<sup>ii</sup>.



## COMMON NAME

**COOKIECUTTER SHARK**, Cigar Shark, Luminous Shark, Squalelet Féroce (Fr), Tollo Cigaro (Es).

## IDENTIFICATION

- 1 Nearly symmetrical caudal fin with long ventral lobe.
- 2 Spineless dorsal fins, smaller than and set above the pelvic fins. No anal fins.
- 3 Eyes set laterally limiting binocular vision<sup>ii</sup>.

## COLOUR

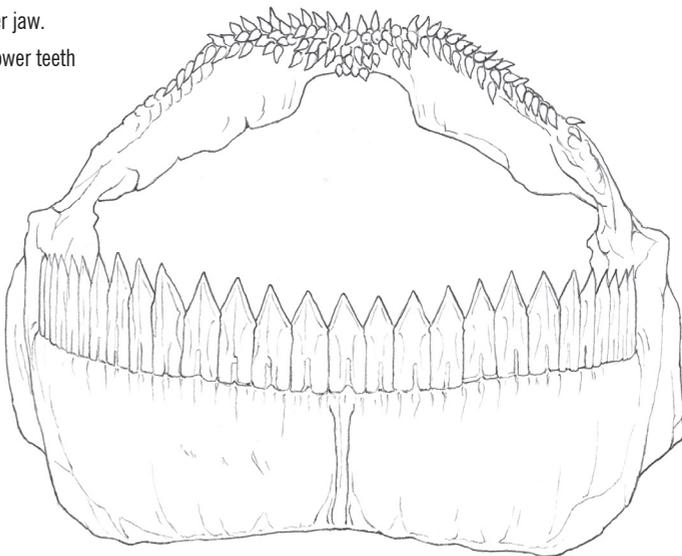
- Prominent dark collar around the branchial region.
- Dark of light brown dorsally, lighter ventrally.
- Entire ventral surface covered in light producing photophores<sup>i</sup>. Collar can glow green<sup>iii</sup>.

## BIOLOGY AND SIZE

- Mature: 38–44cm ♀, 31–37cm ♂. Max TL: 50cm ♀, 39cm ♂<sup>ii</sup>.
- Ovoviviparous, giving birth to 6–12 live young. It is believed that oceanic islands provide nursery areas.
- Diet is primarily cephalopods and fish, but also parasitises fish and mammals<sup>i</sup>.

## TEETH

- 30–37 small, erect teeth in upper jaw.
- 25–31 large, triangular-cusped lower teeth in lower jaw.



## SIMILAR SPECIES



- Isistius brasiliensis*, Cookiecutter Shark



- Isistius plutodus*, Largetooth Cookiecutter Shark



- Etmopterus princeps*, Great Lanternshark



- Etmopterus spinax*, Velvet Belly Lanternshark



- Centroscyllium fabricii*, Black Dogfish

## HABITAT

- Sometimes caught at the surface but usually from 85–3,500m.
- Thought to migrate vertically, travelling as much 2,000–3,000m to feed near the surface at night<sup>i</sup>.

## CONSERVATION STATUS

- A widespread but sparsely distributed species which is too small to be regularly taken in fisheries<sup>v</sup>.
- Red List status:** Least Concern (2003).

## COMMERCIAL IMPORTANCE

- Of no commercial interest due to its small size and rarity of its capture<sup>v</sup>.

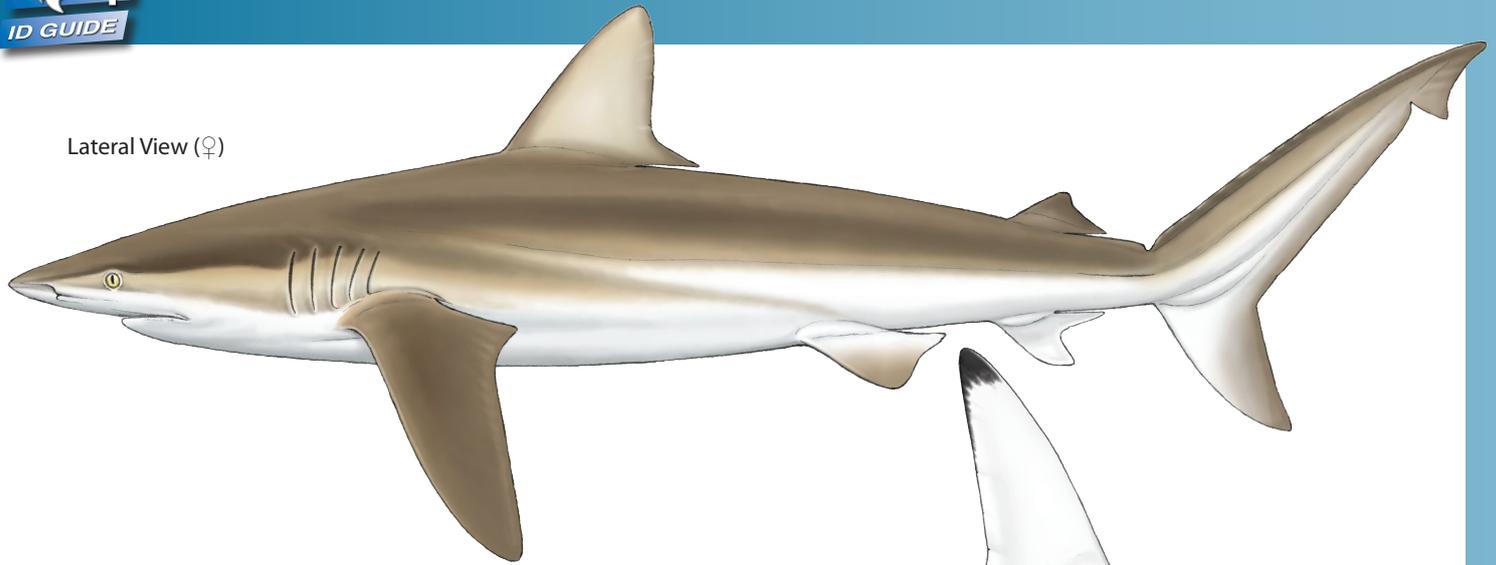
## HANDLING

- Handle with care.
- Large, sharp teeth.
- Abrasive skin.

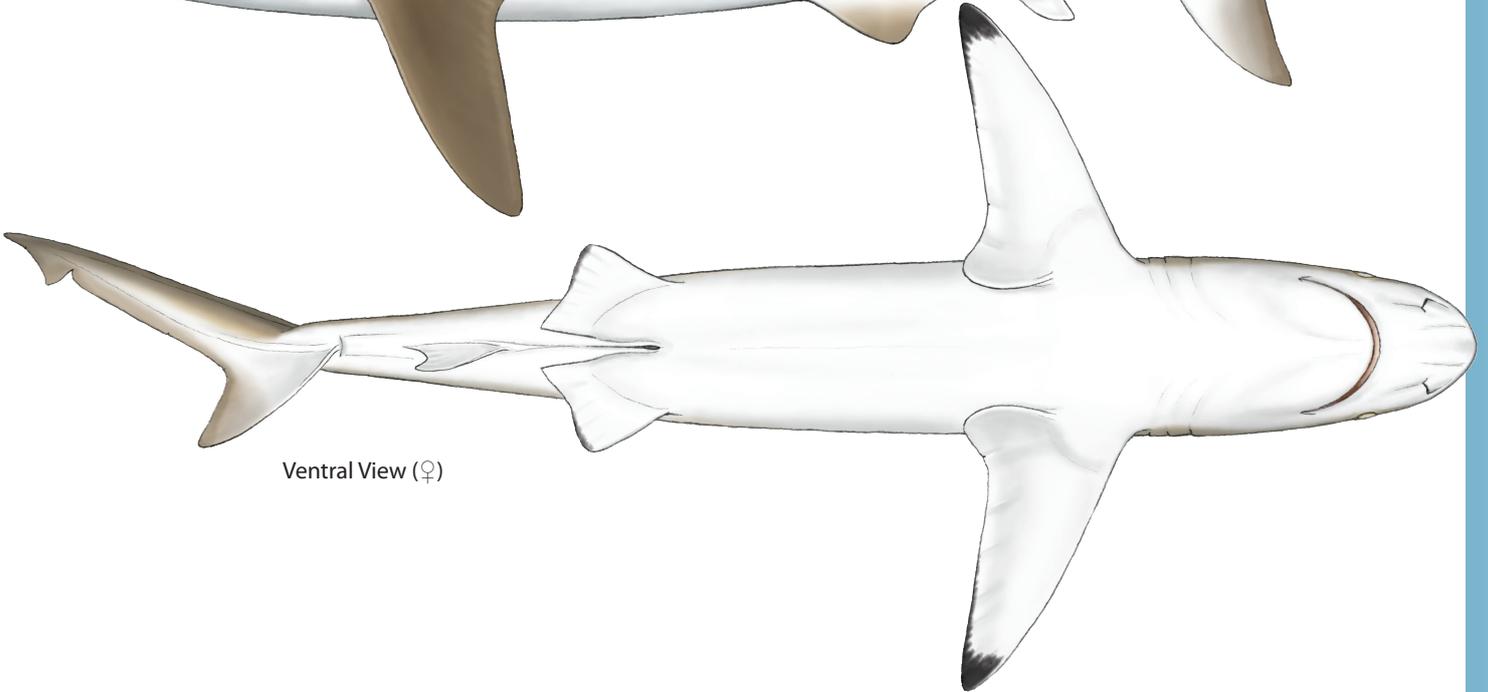
## REFERENCES

- Bester, C; Unknown. FLMNH.
- Compagno, L. J. V.; 1984. FAO.
- Compagno, L. J. V. *et al*; 2005. HarperCollins Publishers.
- Stevens, J; 2003. IUCN Red List.

Lateral View (♀)



Ventral View (♀)



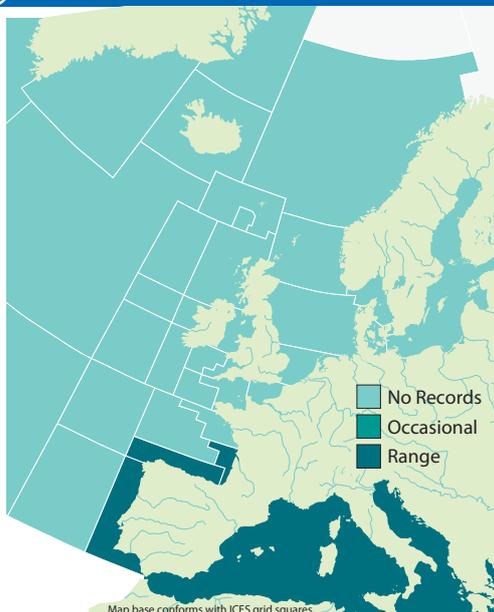
### COMMON NAMES

**Copper Shark**, Narrowtooth Shark, Bronze Whaler, Bronze Shark, Cocktail Shark, New Zealand Whaler, Requin Cuivre (Fr), Tiburón Cobrizo (Es).

### SYNONYMS

*Carcharias lamiella* (Jordan and Gilbert, 1882), *Eulamia athena* (Stead, 1938), *Carcharhinus improvisus* (Smith, 1952), *Carcharhinus rochensis* (Abella, 1972), *Carcharhinus remotoides* (Deng, Xiong and Zhan, 1981), *Carcharhinus acarenatus* (Morenos and Hoyos, 1983)

### DISTRIBUTION



Found almost worldwide in warm temperate and subtropical waters. In the east Atlantic it has been reported from France to Morocco, Guinea, Namibia to South Africa and the whole of the Mediterranean (Compagno, 1984).

### APPEARANCE

- Stocky with a slight arch to the body above the gills.
- Large, circular eyes.
- Narrowly rounded or pointed snout.
- No interdorsal ridge.
- Small first dorsal fin with short free rear tip.
- Long pectoral fins.
- First dorsal fin originates over or slightly behind the pectoral fins.
- Bronze grey dorsally, white ventrally.
- No markings on fins.

The Copper Shark is a large shark which can reach 292cm in length. The snout is long and broadly rounded with an arched mouth reaching behind the large, circular eyes. The first dorsal fin is small with a short free rear tip, the second is similar but much smaller. The pectoral fins are long with a large free rear tips. The anal fin is similar in size to the second dorsal fin. The caudal fin is heterocercal but both lobes are well developed (Compagno, 1984).

It is bronze to olive-grey in colour dorsally and white ventrally. It has dark markings along the edges of its fins and white or dusky tips. Often confused with the Blacktip Shark, *Carcharhinus limbatus*, and the Spinner Shark, *Carcharhinus brevipinna* (Press, Unknown).

## SIMILAR SPECIES

*Carcharhinus brevipinna*, Spinner Shark

*Carcharhinus falciformis*, Silky Shark

*Carcharhinus obscurus*, Dusky Shark

*Carcharhinus plumbeus*, Sandbar Shark

*Carcharhinus brachyurus*,  
Copper Shark

*Carcharhinus brevipinna*,  
Spinner Shark

*Carcharhinus falciformis*,  
Silky Shark

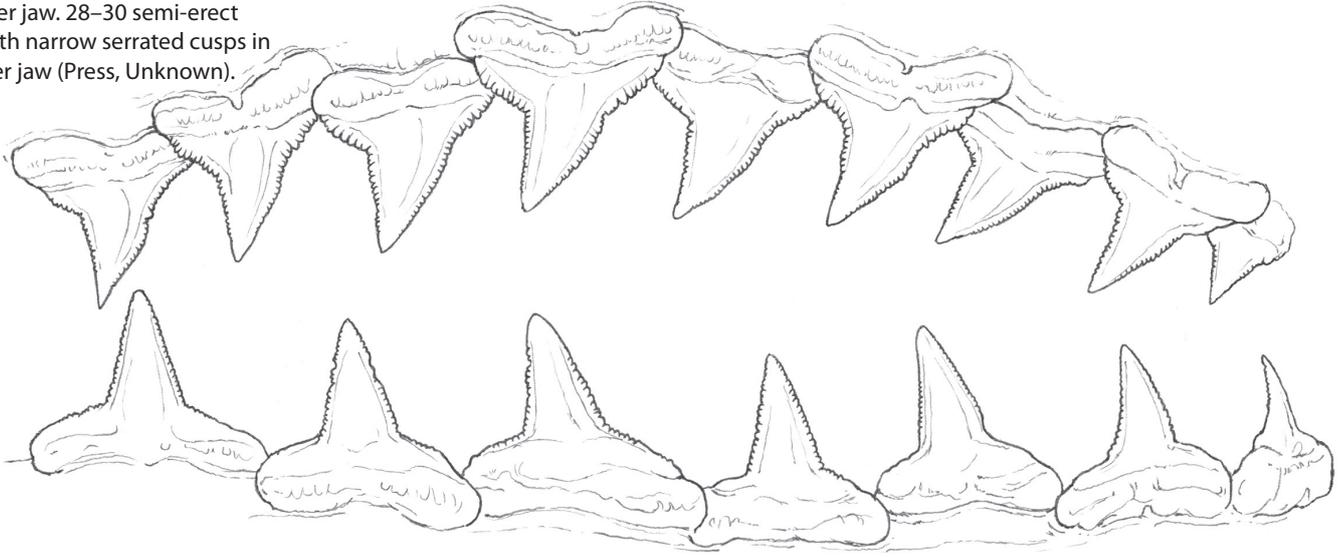
*Carcharhinus obscurus*,  
Dusky Shark

*Carcharhinus plumbeus*,  
Sandbar Shark

(Not to scale)

### TEETH

28–32 narrow, bent-cusped, serrated teeth without cusplets in the upper jaw. 28–30 semi-erect teeth with narrow serrated cusps in the lower jaw (Press, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Copper Shark is unique in the genus *Carcharhinus*, preferring temperate waters instead of tropical (Lucifora *et al.*, 2005). It can be found in shallow bays, estuaries and harbour zones during the summer and has been reported from brackish waters. Further out it has been found pelagically, close to the continental shelf. It has been recorded to 100m but probably ranges much deeper (Duffy and Gordon, 2003).

In temperate waters, migrations towards higher latitudes have been recorded during the summer. It is likely that these movements are related to temperature or prey migration. Like many other large predatory species, the Copper Shark follows the 'sardine run' along the coasts of southern Africa when it occurs. It is known to form schools of hundreds of individuals, either in relation to breeding or feeding, but is regularly recorded singularly (Duffy and Gordon, 2003).

#### DIET

The diet of the Copper Shark is known to include sardines, anchovies, catfish, mullets, jacks, porgies, gurnards, hake, ling, sea bream and sole, as well as dogfish (*Squalus* spp.), stingrays, torpedo rays, sawfish, squid, octopus and cuttlefish. Juveniles also feed on jellyfish and benthic crustaceans. Sharks over 2m in length take other elasmobranchs more often than those smaller than 2m (Duffy and Gordon, 2003).

#### REPRODUCTION

Females mature at 227–244cm, males at 206–235cm. This corresponds to an age of 20 years for females and 13 years for males. The Copper Shark employs a viviparous mode of reproduction with a yolk-sac placenta. The gestation period is thought to last at least 12 months and that reproduction occurs biennially. Parturition occurs at different times in different areas but has been recorded from June to February. Litters of 13–24 pups have been recorded each measuring 59–70cm total length (Press, Unknown).

#### EGGCASE

N/A

## COMMERCIAL IMPORTANCE

The Copper Shark is primarily taken as bycatch in gillnet and bottom longline fisheries targeting bony fish and other sharks, particularly smoothhounds, *Mustelus* spp., and Tope, *Galeorhinus galeus*. It is also taken in bottom trawl and pelagic longline fisheries but in fewer numbers (Duffy and Gordon, 2003). It is targeted across some of its range (New Zealand, Australia and Brazil) to a limited extent for its flesh, fins, liver and hide. It is popular with sport anglers and can be caught from beaches (Press, Unknown).

## THREATS, CONSERVATION, LEGISLATION

A large, coastal species with low productivity, the Copper Shark is vulnerable to fishing pressure and habitat destruction. Although widespread, it is not naturally abundant and there appears to be limited genetic exchange between discrete populations. It is exploited by fisheries across its range but catches are mostly grouped with other *Carcharhinus* species so any declines are likely to go unnoticed. As it utilises inshore nursery areas, the majority of animals taken in fisheries, affected by pollution or displaced by habitat destruction are likely to be juveniles and pregnant females (Press, Unknown).

## IUCN RED LIST ASSESSMENT

Near Threatened (2003).

## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

- COMPAGNO, L. J. V. 1984. FAO Species Catalogue, Vol. 4, Part 1: Sharks of the World. An Annotated and Illustrated Catalogue of Shark Species Known to Date. FAO. Rome, Italy.
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- PRESS, M. Unknown. Narrowtooth Shark. Florida Museum of Natural History. [www.flmnh.ufl.edu/fish/](http://www.flmnh.ufl.edu/fish/).

Text: Richard Hurst.  
Illustrations: Marc Dando.

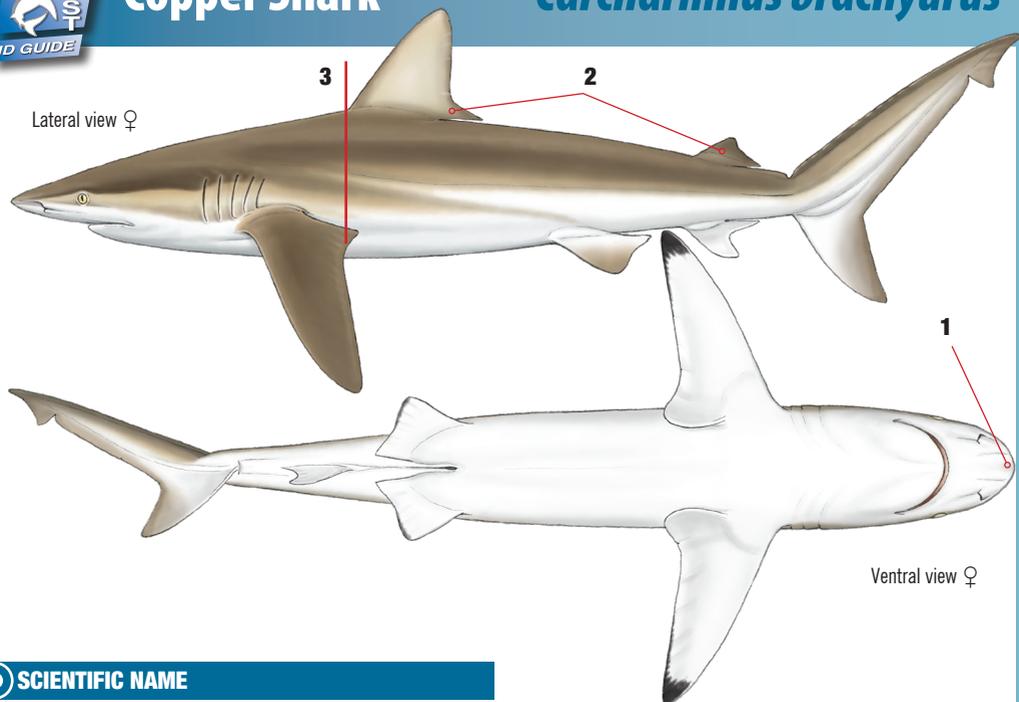
### Citation

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Lateral view ♀

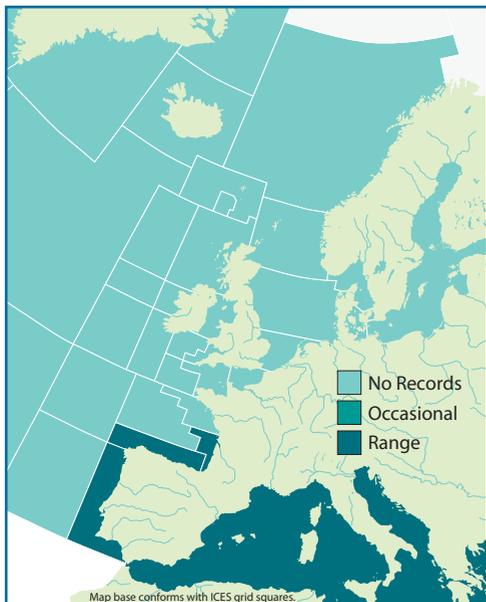
Ventral view ♀

## SCIENTIFIC NAME

*Carcharhinus brachyurus* (Günther, 1870).

## DISTRIBUTION

Almost circumglobal in warm temperate and subtropical waters. East Atlantic from France to Morocco, Guinea, Namibia to South Africa and the Mediterranean Sea<sup>i</sup>.



## COMMON NAME

**COPPER SHARK**, Narrowtooth Shark, Bronze Whaler, Bronze Shark, Cocktail Shark, New Zealand Whaler, Requin Cuivre (Fr), Tiburón Cobrizo (Es).

## IDENTIFICATION

- 1 Bluntly pointed broad snout.
- 2 Small dorsal fins with short rear tips.
- 3 First dorsal fin originates over pectoral fin rear tips.

## COLOUR

- Bronze grey dorsally.
- White ventrally.
- No markings on fins<sup>v</sup>.

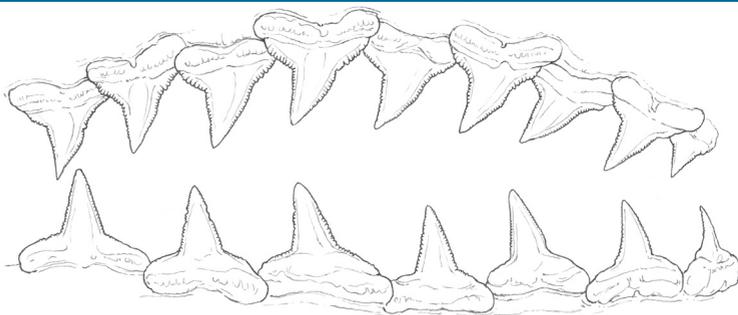
## BIOLOGY AND SIZE

- Born: 59–70cm. Mature: <240cm ♂, 200–229cm ♀. Max TL: 294cm<sup>iv</sup>.
- Gestation thought to last at least 12 months. 13–24 pups born in each litter<sup>v</sup>.
- Feeds on a wide variety of teleost fish, elasmobranchs, molluscs and cephalopods as well as benthic crustaceans<sup>ii</sup>.

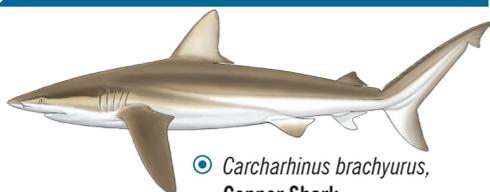


## TEETH

- 28–32 narrow, serrated teeth with bent cusps in upper jaw.
- 28–30 narrow, serrated teeth with semi-erect cusps in lower jaw.
- No cusplets<sup>iv</sup>.



## SIMILAR SPECIES



*Carcharhinus brachyurus*,  
**Copper Shark**



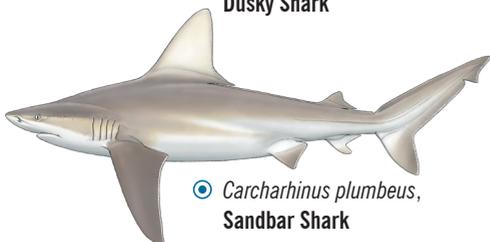
*Carcharhinus brevipinna*,  
**Spinner Shark**



*Carcharhinus falciformis*,  
**Silky Shark**



*Carcharhinus obscurus*,  
**Dusky Shark**



*Carcharhinus plumbeus*,  
**Sandbar Shark**

## HABITAT

- Surface to at least 100m. Has been recorded in shallow estuaries and brackish water<sup>ii</sup>.
- Unique among *Carcharhinus* spp. in preferring temperate waters over tropical<sup>iii</sup>.
- Migrate to follow food supplies, notably the sardine run along the coasts of southern Africa<sup>ii</sup>.

## CONSERVATION STATUS

- Large shark with life history traits which make it vulnerable to overfishing. Fished across its range and killed as a pest species around Australia. Population trends are poorly understood<sup>i</sup>.
- Red List status:** Near Threatened (2003).

## COMMERCIAL IMPORTANCE

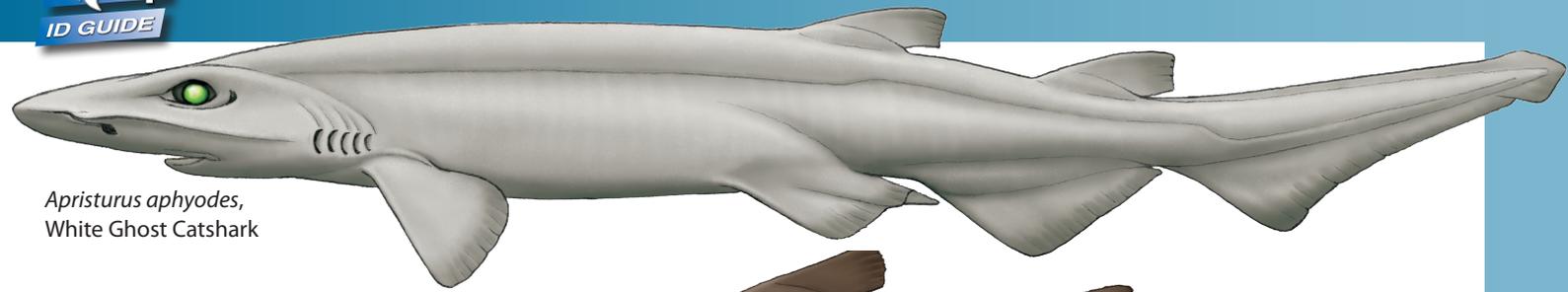
- Taken primarily as bycatch in gillnet and longline fisheries targeting teleost fish and other sharks.
- Targeted across some of its range (South Africa, Australasia, East Asia, South America).
- Targeted by recreational anglers, particularly off New Zealand, Australia and South Africa<sup>ii</sup>.

## HANDLING

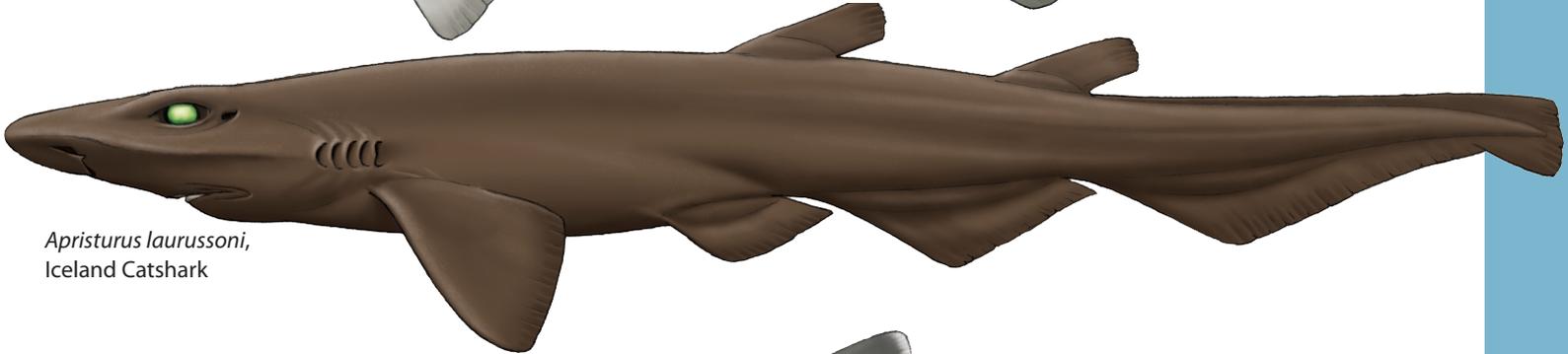
- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

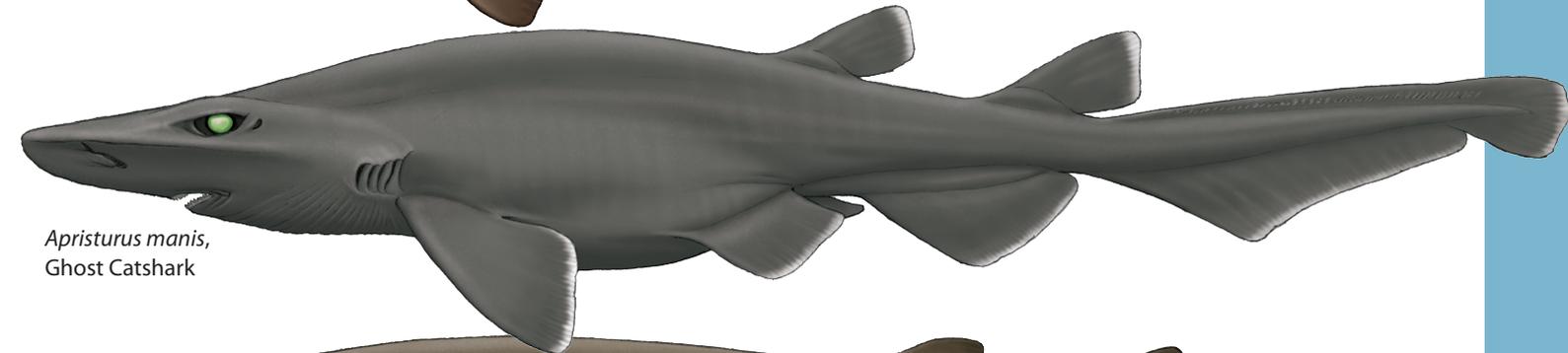
- Compagno, L. J. V. *et al.*; 2005. HarperCollins Publishers.
- Duffy, C. *et al.*; 2003. IUCN Red List.
- Lucifora, L. O. *et al.*; 2005. *ICES J. Mar. Sci.*
- Press, M.; Unknown. FLMNH.



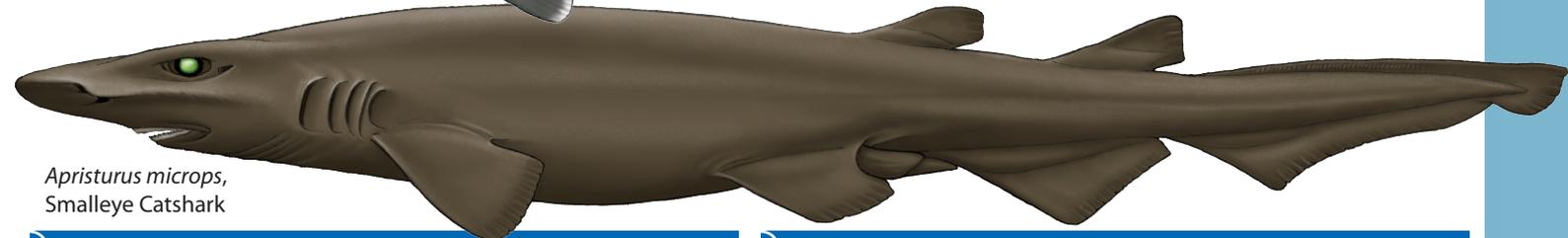
*Apristurus aphyodes*,  
White Ghost Catshark



*Apristurus laurussoni*,  
Iceland Catshark



*Apristurus manis*,  
Ghost Catshark



*Apristurus microps*,  
Smalleye Catshark

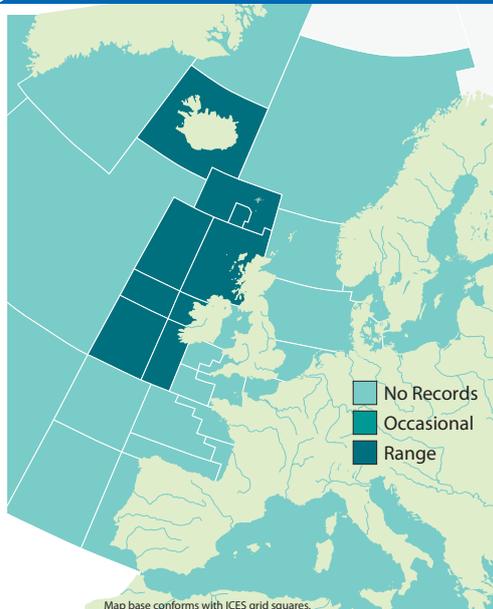
### SYNONYMS

*Scyllium laurussonii* (Saemundsson, 1922), *Apristurus laurussonii* (Saemundsson, 1922), *Apristurus atlanticus* (Koefoed, 1927) *Scylliorhinus atlanticus* (Koefoed, 1927), *Apristurus maderensis* (Cadenet & Maul, 1966), *Apristurus profundurum* (non Goode & Bean, 1896), *Parmaturus manis* (Springer, 1979), *Scylliorhinus microps* (Gilchrist, 1922), *Pentachus microps* (Gilchrist, 1922).

### COMMON NAMES

**White Ghost Catshark** (*Apristurus aphyodes*), **Iceland Catshark** (*Apristurus laurussoni*), **Ghost Catshark** (*Apristurus manis*), **Smalleye Catshark** (*Apristurus microps*), **Black Roughscale Catshark** (*Apristurus melanoasper*) (Not Illustrated).

### DISTRIBUTION



Demon Catsharks are found worldwide with at least four species known from the northeast Atlantic (Compagno *et al.*, 2005). The Black Roughscale Catshark, *Apristurus melanoasper*, has widely been accepted as a distinct species and is listed in the northeast Atlantic by George and Zidowitz (2006).

### APPEARANCE

- Long, laterally expanded snout and head
- Large nostrils with reduced, anterior nasal flaps.
- Labial furrows very long
- Small, spineless dorsal fins set far back
- Very large anal fin with elongated base. Separated from the caudal fin by only a notch.
- Uniform colouration ranging from white to black. (Compagno, 1984).

**SIMILAR SPECIES**

*Galeus atlanticus*, Atlantic Sawtail Catshark

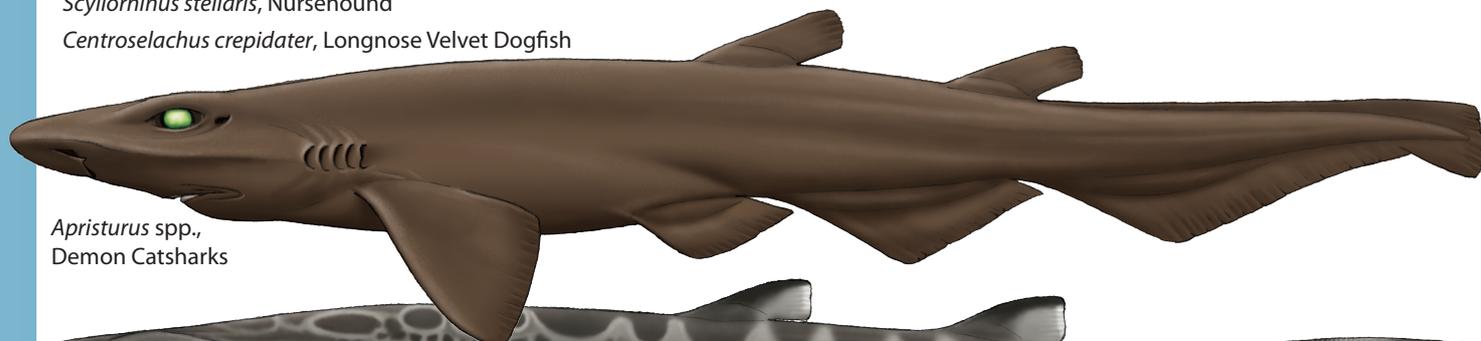
*Galeus murinus*, Mouse Catshark

*Galeus melastomus*, Blackmouth Catshark

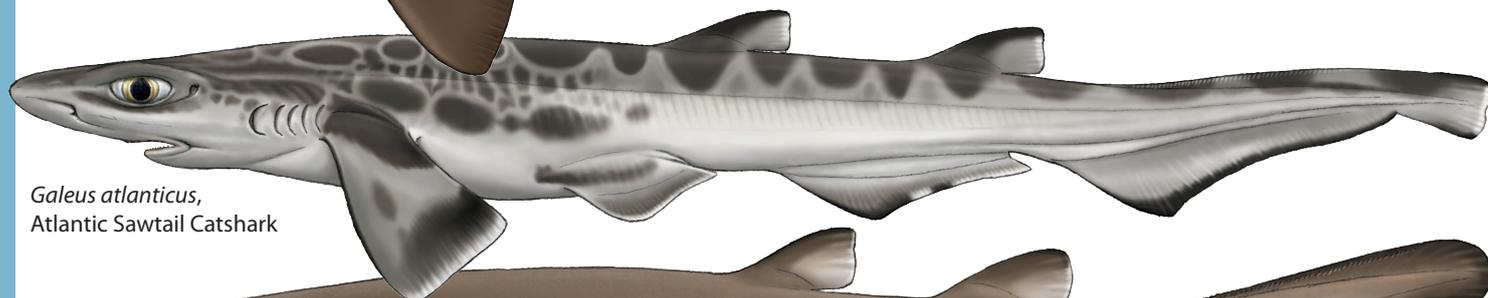
*Scyliorhinus canicula*, Smallspotted Catshark

*Scyliorhinus stellaris*, Nursehound

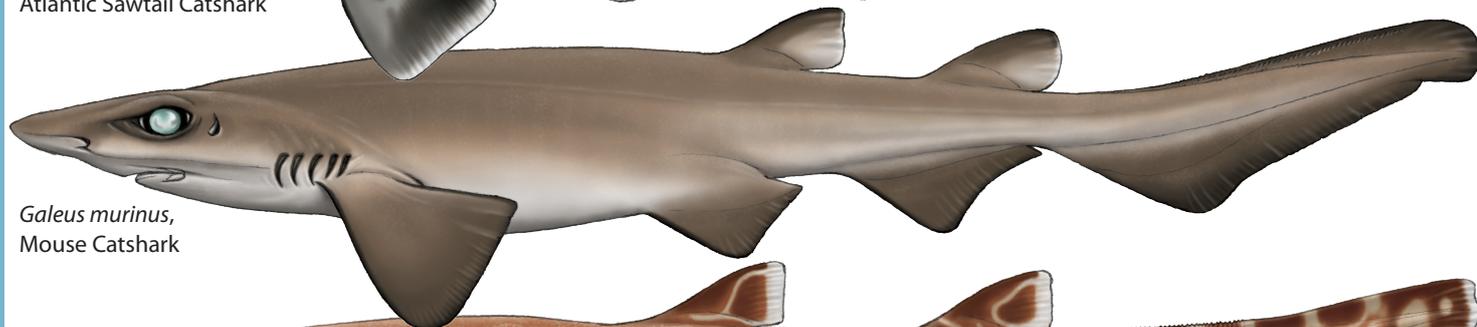
*Centroselachus crepidater*, Longnose Velvet Dogfish



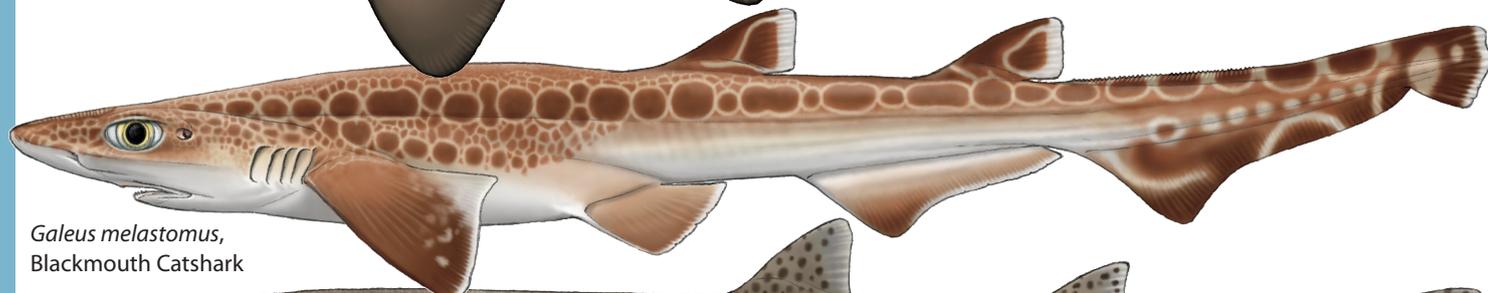
*Apristurus* spp.,  
Demon Catsharks



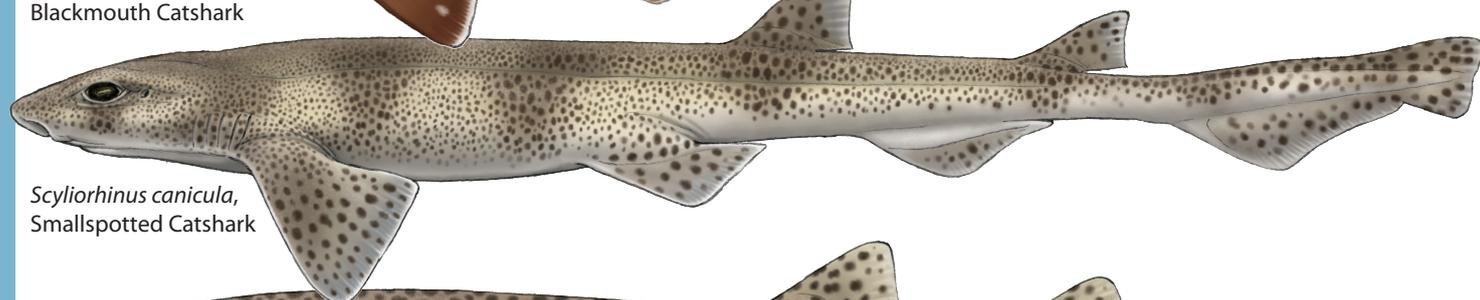
*Galeus atlanticus*,  
Atlantic Sawtail Catshark



*Galeus murinus*,  
Mouse Catshark



*Galeus melastomus*,  
Blackmouth Catshark



*Scyliorhinus canicula*,  
Smallspotted Catshark



*Scyliorhinus stellaris*,  
Nursehound



*Centroselachus crepidater*,  
Longnose Velvet Dogfish

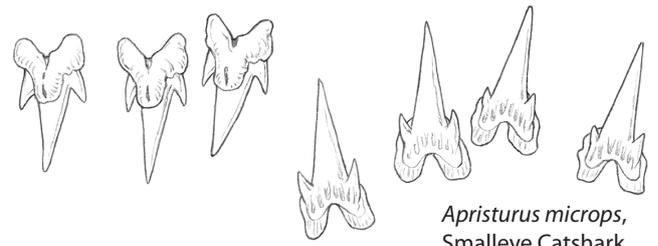
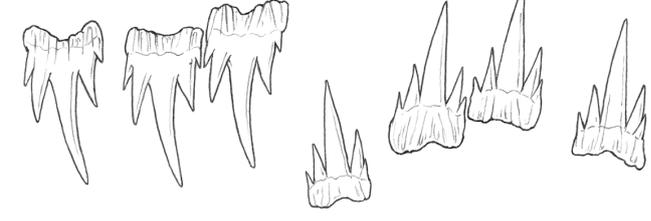
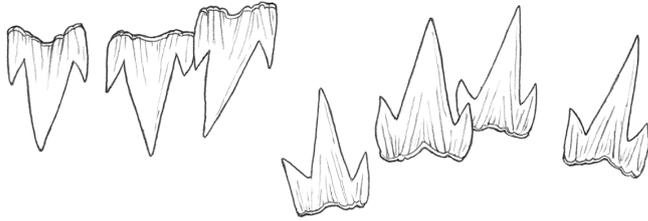
(Not to scale)

### TEETH

Prominent central cusp and one or more pairs of lateral cusplets on each tooth (Compagno *et al.*, 2005)

*Apristurus aphyodes*,  
White Ghost Catshark

*Apristurus manis*,  
Ghost Catshark



*Apristurus laurussoni*,  
Iceland Catshark

*Apristurus microps*,  
Smalleye Catshark

### ECOLOGY AND BIOLOGY

#### HABITAT

Depending on the species, Demon Catsharks can be found on continental slopes in the northeast Atlantic from 512 to 2,200 metres. They are all demersal found over soft substrates such as sand and mud. The Iceland Catshark is reportedly quite common on the upper continental slopes (Compagno *et al.*, 2005). The White Ghost Catshark, known from 30 specimens, occurs at bottom water temperatures of 3.67 to 9.57°C and salinities of 35.13 to 34.87 ppm (Duffy and Huvneers, 2004).

#### EGGCASE

- Unknown for many species.
- Average 50-68mm in length.
- Average 25-29mm in width.
- May have thick walls and weak, fibrous tendrils (Duffy and Huvneers, 2004).

Similar eggcase to the Blackmouth Catshark, *Galeus melastomus*.

#### DIET

The diet of the Demon Catsharks is poorly understood but the Smalleye Catshark is known to feed on small bony fishes, shrimp, squid and other small sharks (Compagno *et al.*, 2005). The Smalleye Catshark is known to migrate off the bottom to feed on midwater prey (Ebert, 2004b)

#### REPRODUCTION

Very little is known of the biology and reproduction of the Demon Catsharks, except that they are oviparous (Compagno *et al.*, 2005). Off South Africa gravid Smalleye Catsharks were found year round, suggesting that there is little or no seasonality to the reproductive cycle (Ebert *et al.*, 2006). It reportedly matures around 50cm in length (Ebert, 2004b). White Ghost Catsharks have been reported as adolescent at 40-46cm and mature at 47-50cm (Duffy and Huvneers, 2004). Female Iceland Catsharks are reported to mature above 59.2cm in length (Duffy and Huvneers, 2007). The Ghost Catshark matures larger at 75.8cm for females and 85.2cm for males (Ebert, 2004a).

## COMMERCIAL IMPORTANCE

The Demon Catsharks are of little commercial importance although they may be taken as bycatch across much of their range and discarded (Gibson *et al.*, 2006).

## THREATS, CONSERVATION, LEGISLATION

Sparsely distributed throughout large ranges, the Demon Catsharks are uncommon bycatch of deep-water trawl fisheries. As very little is known of their stock structure and natural abundance, it is unknown if this is having a detrimental effect on populations. With a trend for increasing deepsea fisheries effort, future catches should be closely monitored and managed to ensure no significantly population declines occur (Gibson *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

White Ghost Catshark: Data Deficient (2004).  
Iceland Catshark: Data Deficient (2007).  
Ghost Catshark: Least Concern (2004).  
Black Roughscale Catshark: Data Deficient (2008).  
Smalleye Catshark: Least Concern (2004).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

### REFERENCES

- COMPAGNO, L. J. V. 1984. Sharks of the World: An Annotated and Illustrated Catalogue of Shark Species Known to Date. Volume 4, Part 1. Hexanchiformes to Lamniformes. FAO. Rome, Italy.
- COMPAGNO, L., DANDO, M., FOWLER, S. 2005. Sharks of the World. HarperCollins Publishers Ltd. London, UK.
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- COTTON, C. 2009. Personal Communication.
- DUFFY, C., HUVENEERS, C. 2004. *Apristurus aphyodes*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.1. [www.iucnredlist.org](http://www.iucnredlist.org).
- DUFFY, C., HUVENEERS, C. 2007. *Apristurus laurussonii*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.1. [www.iucnredlist.org](http://www.iucnredlist.org).
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- EBERT, D. A., COMPAGNO, L. J. V., COWLEY, P. D. 2006. Reproductive biology of catsharks (Chondrichthyes: Scyliorhinidae) off the west coast of southern Africa. *ICES Journal of Marine Science*. Vol. 63 (6).
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- IGLÉSIAS, S. P., DU BUIT, M-H., NAKAYA, K. 2002. Egg Capsules Of Deep-Sea Catsharks From Eastern North Atlantic, With First Descriptions Of The Capsule Of *Galeus Murinus* And *Apristurus Aphyodes* (Chondrichthyes: Scyliorhinidae). *Cybium*, Vol. 26 (1): 59-63.

Text: Richard Hurst.

Illustrations: Marc Dando.

#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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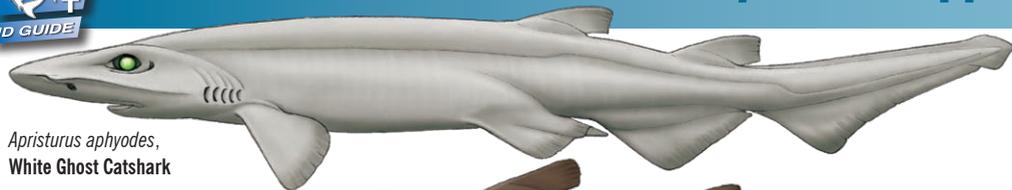
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**Email:** [enquiries@sharktrust.org](mailto:enquiries@sharktrust.org)

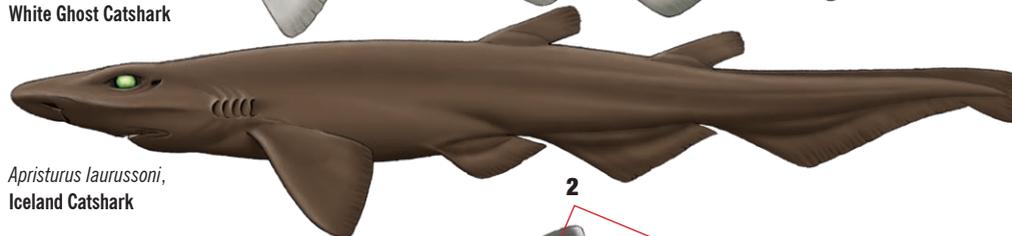
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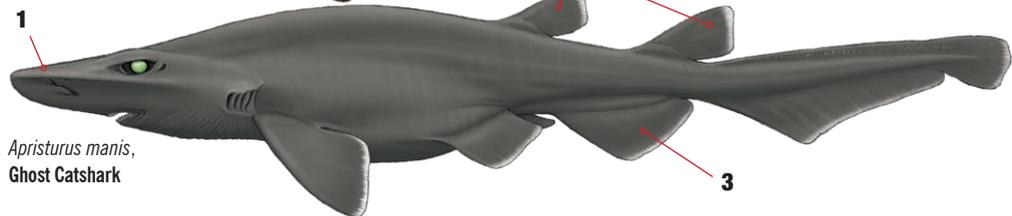
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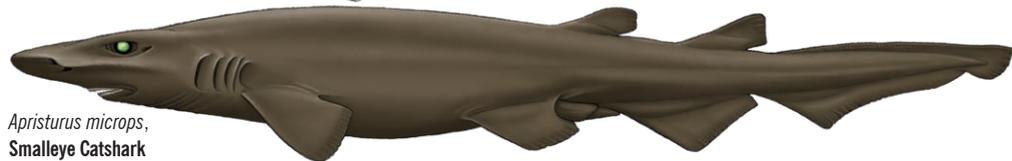
*Apristurus aphyodes*,  
White Ghost Catshark



*Apristurus laurussoni*,  
Iceland Catshark



*Apristurus manis*,  
Ghost Catshark



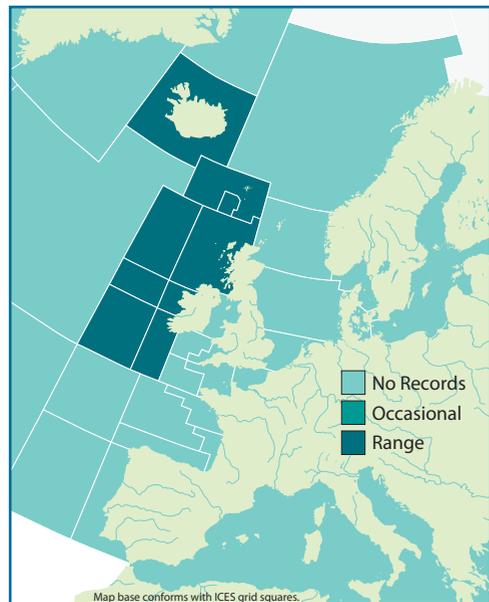
*Apristurus microps*,  
Smalleye Catshark

## SCIENTIFIC NAME

*Apristurus* (Garman, 1913).

## DISTRIBUTION

At least five species in northeast Atlantic<sup>ii</sup>.



## COMMON NAME

White Ghost Catshark, Iceland Catshark, Ghost Catshark, Smalleye Catshark, Black Roughscale Catshark (not shown).

## IDENTIFICATION

- 1 Long, laterally expanded snout with wide nostrils.
- 2 Two spineless dorsal fins set far back on the body.
- 3 Large anal fin with elongated base<sup>i</sup>.

## COLOUR

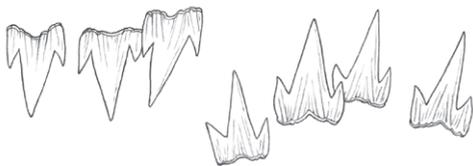
- Generally uniform in colour.
- Varies with species from black to white<sup>ii</sup>.

## BIOLOGY AND SIZE

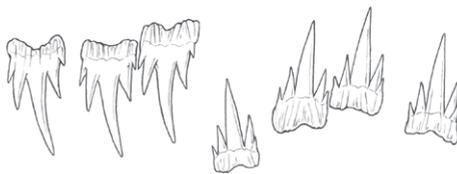
- Mature: 40–61cm. Max TL: 99cm.
- Oviparous, life history essentially unknown.
- Some species known to feed on decapod crustaceans, cephalopods, bony fish and chondrichthyans<sup>iii</sup>.



## TEETH



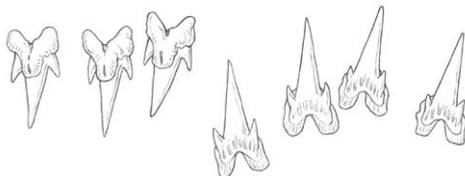
⊙ *Apristurus aphyodes*, **White Ghost Catshark**



⊙ *Apristurus manis*, **Ghost Catshark**



⊙ *Apristurus laurusosoni*, **Iceland Catshark**



⊙ *Apristurus microps*, **Smalleye Catshark**

- ⊙ Prominent central cusp.
- ⊙ One or more pairs of lateral cusplets<sup>ii</sup>.

## SIMILAR SPECIES



⊙ *Apristurus* sp., **Demon Catsharks**



⊙ *Galeus murinus*, **Mouse Catshark**



⊙ *Galeus melastomus*, **Blackmouth Catshark**



⊙ *Centrophorus squamosus*, **Leafscale Gulper Shark**



⊙ *Centroselachus crepidater*, **Longnose Velvet Dogfish**

## HABITAT

- ⊙ Deep sea group found from 560–2,200m.
- ⊙ Usually demersal, possibly prefer soft substrates<sup>ii</sup>.
- ⊙ Have been observed drifting almost vertically, head down, near the bottom<sup>iv</sup>.

## CONSERVATION STATUS

- ⊙ Little known group of species probably distributed beyond the range of most commercial fisheries<sup>ii</sup>.
- ⊙ **Red List status:** Not Evaluated.

## COMMERCIAL IMPORTANCE

- ⊙ Of no commercial importance due to rarity of capture.
- ⊙ Presumably utilised with other deep sea sharks for their liver oil and flesh.

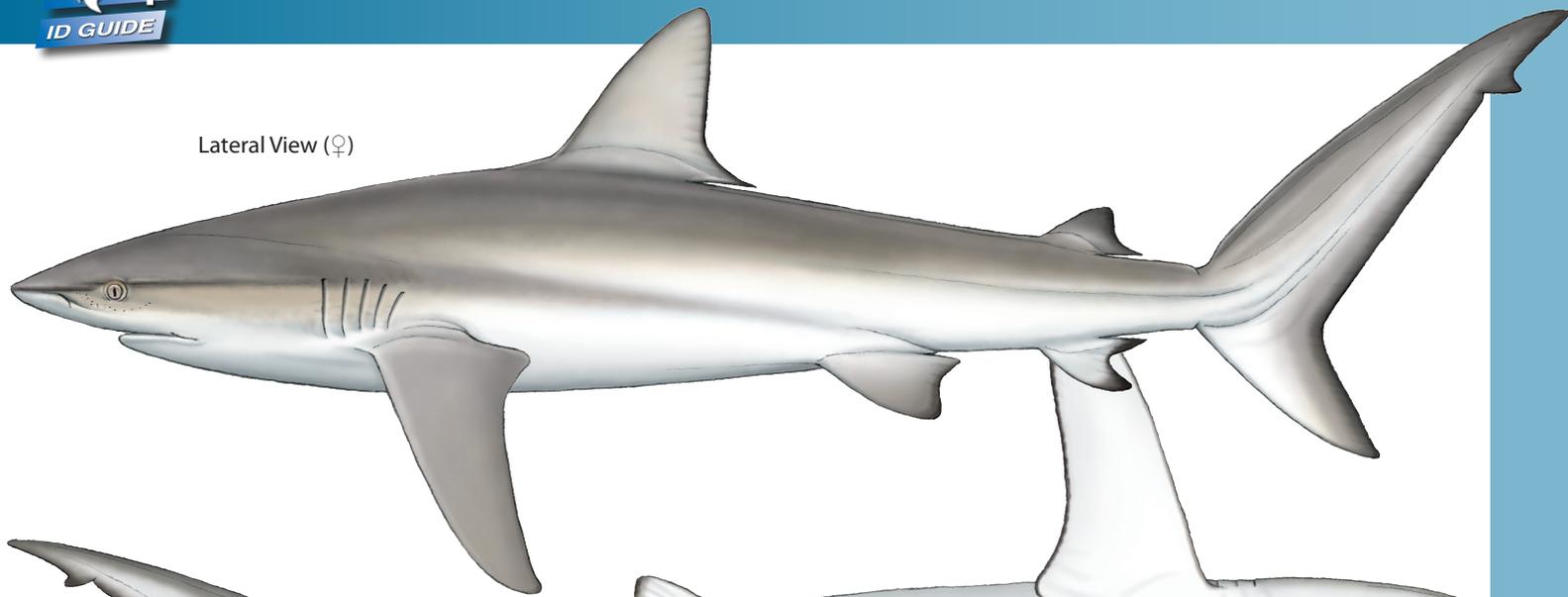
## HANDLING

- ⊙ Handle with care.
- ⊙ Sharp teeth.

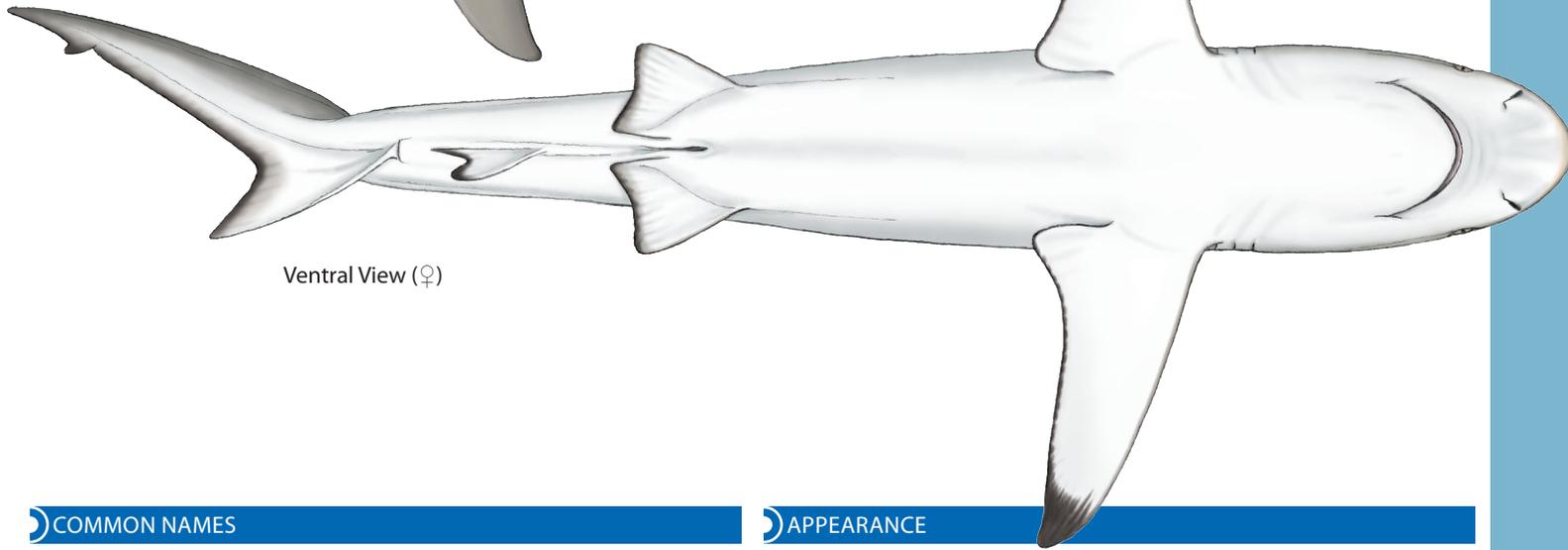
## REFERENCES

- Compagno, L. J. V.; 1984. *FAO*.
- Compagno, L. J. V. *et al*; 2005. HarperCollins Publishers.
- Cortés, E.; 1999. *ICES JMS*.
- Cotton, C.; 2009. *Pers. Comm*.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Dusky Shark**, Bay Shark, Black Whaler, Bronze Whaler, Brown Shark, Common Whaler, Dusky Ground Shark, Shovelnose Shark, Requin Sombre (Fr), Tiburón Arenero (Es).

### SYNONYMS

*Squalus obscurus* (LeSueur, 1818), *Prionodon obvelatus* (Valenciennes, in Webb & Berholt, 1844), *Galeolamna greyi* (Owen, 1853) *Carcharias macrurus* (Ramsay & Ogilby, 1887), *Galeolamna (Galeolamnoides) eblis* (Whitley, 1944), *Carcharhinus iranxae* (Fourmanoir, 1961), *Carcharhinus obscurella* (Deng, Xiong & Zhan, 1981).

### DISTRIBUTION



The Dusky Shark is found almost worldwide in tropical and warm temperate waters. Its distribution in the east Atlantic is patchy but it has been reported from Portugal to Sierra Leone, including the western Mediterranean (Compagno, 1984).

### APPEARANCE

- Short, broadly rounded snout.
- Low anterior nasal flaps.
- Fairly large eyes.
- Low interdorsal ridge.
- Large, falcate pectoral fins.
- Moderate sized first dorsal with short free rear tip and origin above pectoral free rear tips.
- Low second dorsal.
- No conspicuous marking on fins in adults.

The Dusky Shark is characterised by a snout that is slightly shorter than, or the same size as, the width of the mouth. The origin of the first dorsal fin is over the free rear tips of the large, curved pectoral fins. There is a low interdorsal ridge. It is bluish grey dorsally and white ventrally. In younger animals, the tips are dusky but this is inconspicuous in adults (Knickle, Unknown).



## SIMILAR SPECIES

*Carcharhinus brachyurus*, Copper Shark

*Carcharhinus brevipinna*, Spinner Shark

*Carcharhinus falciformis*, Silky Shark

*Carcharhinus plumbeus*, Sandbar Shark

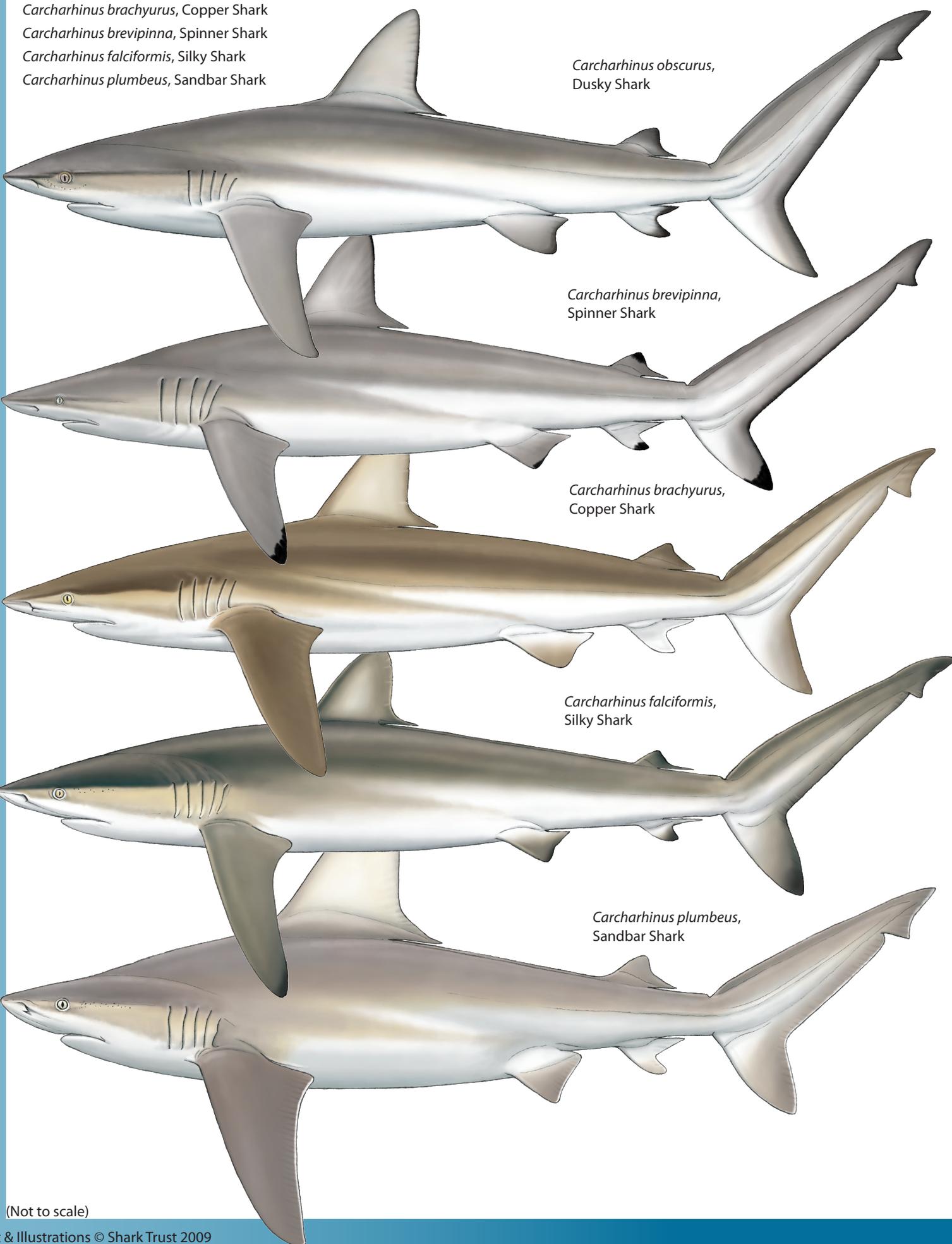
*Carcharhinus obscurus*,  
Dusky Shark

*Carcharhinus brevipinna*,  
Spinner Shark

*Carcharhinus brachyurus*,  
Copper Shark

*Carcharhinus falciformis*,  
Silky Shark

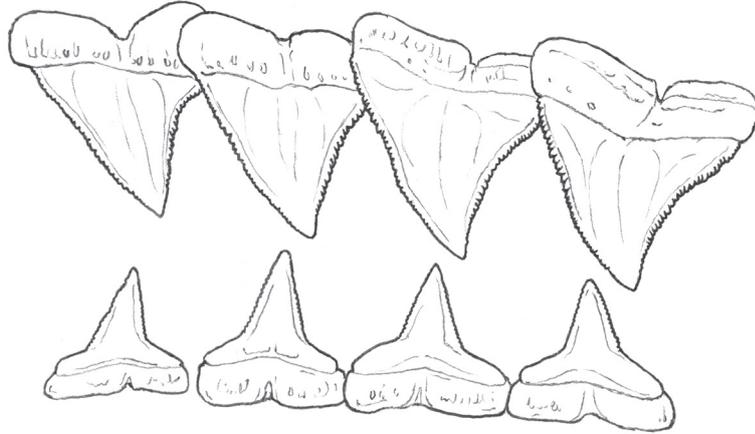
*Carcharhinus plumbeus*,  
Sandbar Shark



(Not to scale)

### TEETH

The upper teeth are triangular and slightly oblique with serrated edges, the lowers are erect, narrow cusped and more finely serrated (Knickle, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Dusky Shark ranges from the surf zone to well offshore and from the surface to at least 400m. It avoids areas of low salinity such as estuaries although young congregate in very shallow water. It is highly migratory moving towards the poles in warmer months and towards the equator during cooler months. Males and females undertake these migrations separately (Knickle, Unknown).

#### EGGCASE

N/A

### DIET

An opportunistic predator on a wide range of teleosts, elasmobranchs, crustaceans, molluscs, carrion and various other benthic organisms. Compagno (1984) lists the prey items as sardines, menhaden and herring, anchovies, eels, lizardfish, cuskeels, needlefish, mullet, barracuda, goatfish, groupers, porgies, grunts, croakers, bluefish, spadefish, jacks, hairtails, mackerel, tunas, soles, flounders and cither flatfishes, flatheads, and gurnards, as well as angelsharks, sawsharks, dogfish (*Centrophorus* and *Squalus*), catsharks (*Halaelurus*), smoothhounds (*Mustelus*), other grey sharks (*Carcharhinus limbatus* and *C. brevipinna*), skates, butterfly rays, crabs, lobsters, shrimp, octopi, cuttlefish, squid, starfish, barnacles, bryozoans, whale meat and occasional garbage (Compagno, 1984).

### REPRODUCTION

Male Dusky Sharks mature at around 280cm, females slightly larger. In the west Atlantic around Florida, mating occurs during the spring. The gestation period is not well understood. If there is no resting period between breeding, it could be as long as 16 months. If the species reproduces biennially, it is likely to be around 8 months. Embryos are nourished through a yolk-sac placenta. In the west Atlantic, litters of 6–10 young have been recorded with an average of 8. In the southeast Atlantic, litters up to 16 pups have been recorded with an average of 10. The size at birth is around 70–100cm (Knickle, Unknown).

## COMMERCIAL IMPORTANCE

The species is regularly taken on longlines, with set bottom nets and on handlines. Its fins are used for shark fin soup, its flesh fresh and preserved for human consumption, its hide for leather, its carcass for fishmeal and its liver can be rendered for vitamin rich oil (Compagno, 1984).

## THREATS, CONSERVATION, LEGISLATION

The Dusky Shark is among the slowest growing, latest maturing sharks. Small litters, long gestation periods and a large size at first sexual maturity all make it vulnerable to fishing pressure. It is taken across its range with other, more productive sharks in mixed species fisheries. Even if discarded, the mortality rate is thought to be high. Populations are hard to quantify due to inadequate reporting and species confusion but catch rates in the west Atlantic have declined significantly (Gibson *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Vulnerable (2007).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

### REFERENCES

- COMPAGNO, L. J. V. 1984. FAO Species Catalogue, Vol. 4, Part 1: Sharks of the World. An Annotated and Illustrated Catalogue of Shark Species Known to Date. FAO. Rome, Italy.
- GIBSON, C., VALENTI, S. V., FOWLER, S. L., FORDHAM, S. V. 2006. The Conservation Status of Northeast Atlantic Chondrichthyans: Report of the IUCN Shark Specialist Group Northeast Atlantic Regional Red List Workshop. Peterborough, UK.
- KNICKLE, C. Unknown. Dusky Shark. Florida Museum of Natural History. [www.flmnh.ufl.edu/fish/](http://www.flmnh.ufl.edu/fish/).
- MUSICK, J. A., Grubbs, R. D., Baum, J., Cortés, E. 2007. *Carcharhinus obscurus*. In: IUCN 2010. IUCN Red List of Threatened Species. [www.iucnredlist.org](http://www.iucnredlist.org).

Text: Richard Hurst.  
Illustrations: Marc Dando.

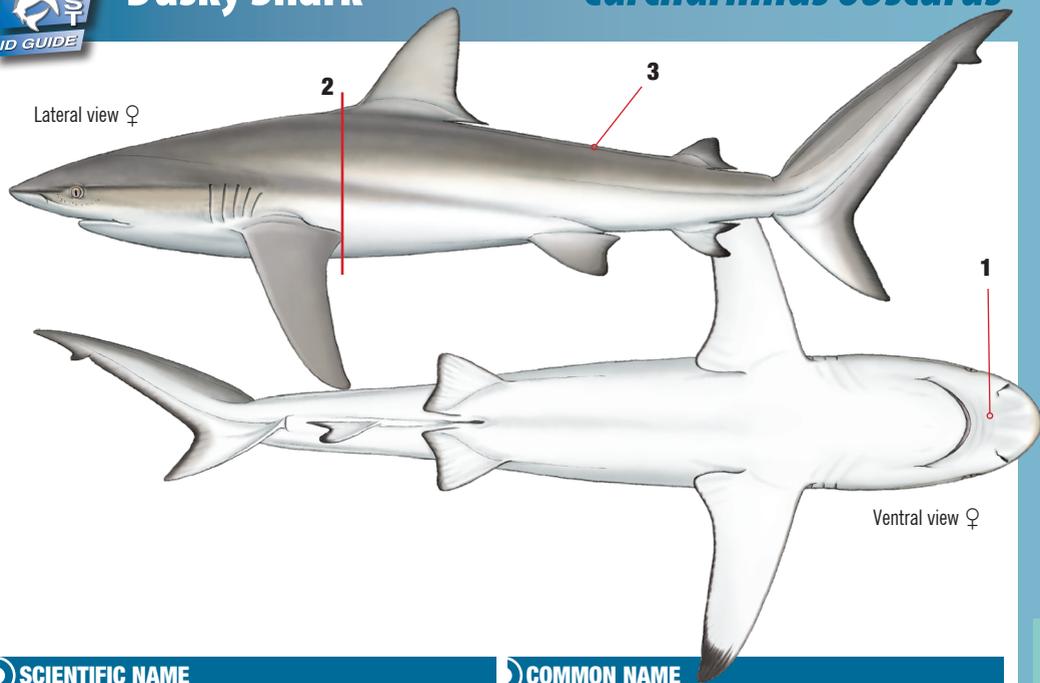
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## SCIENTIFIC NAME

*Carcharhinus obscurus* (LeSueur, 1818).

## DISTRIBUTION

Almost circumglobal distribution. East Atlantic from Spain and Portugal to Morocco, including the western Mediterranean<sup>i</sup>.



## COMMON NAME

**DUSKY SHARK**, Bay Shark, Black Whaler, Bronze Whaler, Brown Shark, Common Whaler, Dusky Ground Shark, Shovelnose Shark, Requin Sombre (Fr), Tiburón Arenero (Es).

## IDENTIFICATION

- 1 Snout shorter or as long as width of mouth.
- 2 First dorsal fin origin over or slightly ahead of pectoral fin rear tips.
- 3 Low interdorsal ridge<sup>ii</sup>.

## COLOUR

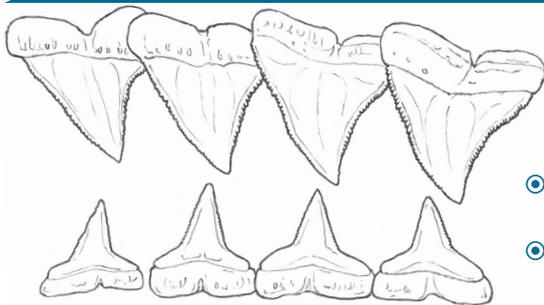
- Bluish grey dorsally.
- White ventrally.
- Fin tips dark in young sharks<sup>ii</sup>.

## BIOLOGY AND SIZE

- Born: 69–100cm. Mature: ~280cm ♂, 280–340cm ♀. Max TL: 400cm<sup>i</sup>
- Litters of 3–14 recorded. No apparent correlation between size of mother and size of litter.
- Primarily a piscivore but will feed on a variety of crustaceans and molluscs. Cetacean carrion recorded but apparently rare<sup>i</sup>.



## TEETH



- Upper teeth triangular and slightly oblique with serrated edges.
- Lower teeth erect, narrow-cusped and more finely serrated<sup>ii</sup>.

## SIMILAR SPECIES



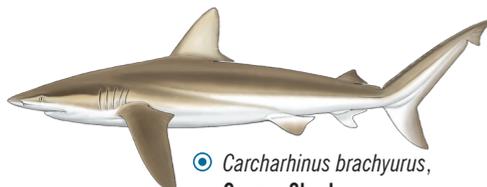
● *Carcharhinus obscurus*,  
Dusky Shark



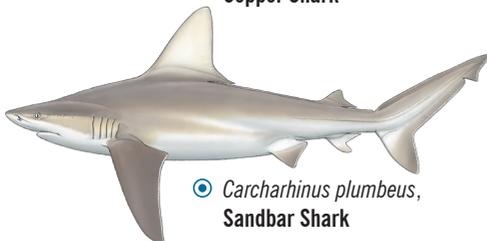
● *Carcharhinus brevipinna*,  
Spinner Shark



● *Carcharhinus falciformis*,  
Silky Shark



● *Carcharhinus brachyurus*,  
Copper Shark



● *Carcharhinus plumbeus*,  
Sandbar Shark

## HABITAT

- Surface to at least 400m. Surf zone to well offshore, but avoids areas of reduced salinity.
- Migratory in temperate and subtropical waters following optimal temperatures.
- Adults have been reported following ships offshore, presumably taking advantage of waste dumping<sup>iii</sup>.

## CONSERVATION STATUS

- One of the slowest growing and latest maturing sharks. Combined with low fecundity, this makes the species very vulnerable to fishing activities. Many adults are killed in beach nets designed to protect bathers<sup>iii</sup>.
- Red List status:** Vulnerable (2009).

## COMMERCIAL IMPORTANCE

- Commonly taken as bycatch on longlines in swordfish/tuna fisheries. Fins, meat, hide and liver can be utilised.
- Juveniles are targeted for their meat in Australia and New Zealand using gillnets.
- Sought by recreational anglers due to its large size and tenacity<sup>ii</sup>.

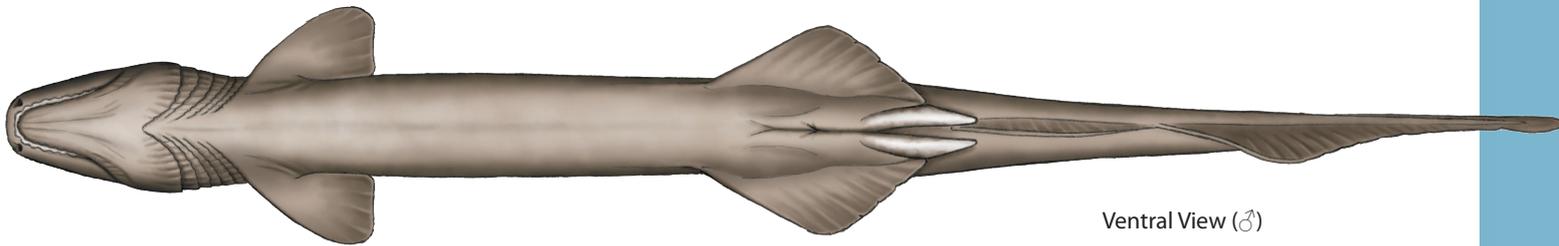
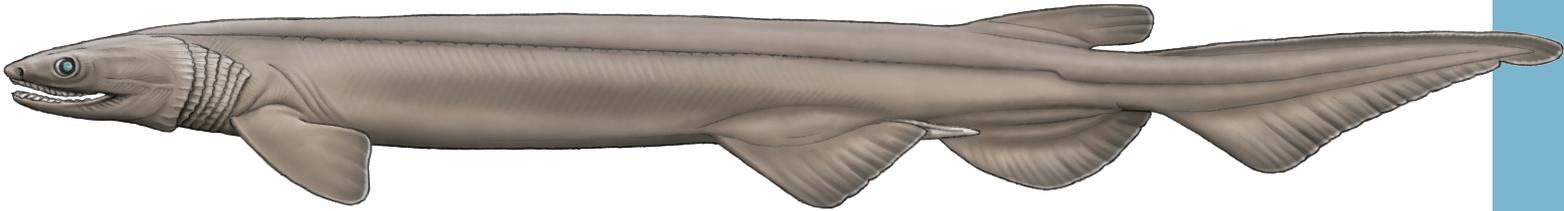
## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

- Compagno, L. J. V. *et al*; 2005. HarperCollins Publishers.
- Knickle, C; Unknown. FLMNH.
- Musick, J. A. *et al*; 2009. IUCN Red List.

Lateral View (♂)



Ventral View (♂)

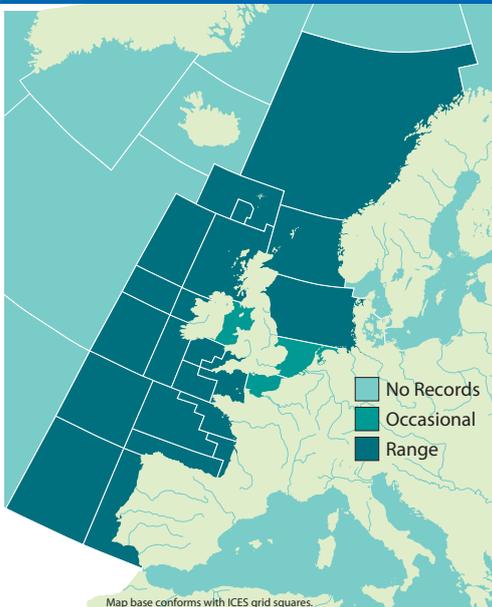
### COMMON NAMES

**Frilled Shark**, Frill-Gilled Shark, Lizard Shark, Scaffold Shark, Silk Shark, Requin Lézard (Fr), Tiburón Anguila (Es).

### SYNONYMS

*Chlamydoselache anguinea* (Garman, 1884), *Chlamydoselachus anguineum* (Garman, 1884), *Didymodus anguineus* (Garman, 1884).

### DISTRIBUTION



The Frilled Shark is widespread but with a patchy distribution. In the east Atlantic it is found from northern Norway to northern Namibia and possibly South Africa. It is also known in the western Indian Ocean, the western Pacific and the eastern Pacific (Compagno *et al.*, 2005).

### APPEARANCE

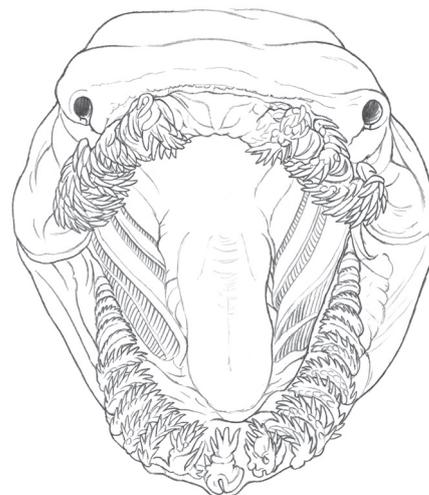
- Distinctive eel-like body shape.
- Flattened head.
- Large mouth with distinctive three-cusped teeth.
- Six large gill slits (first pair join across throat) with frilled edges.
- Extremely large anal fin, larger than single dorsal fin.
- Deep brown in colour.
- Maximum total length of 197cm.

The Frilled Shark is an extremely distinctive, eel-like species. The main diagnostic features are the frilled edges of the six gills (the first pair of which join beneath the throat), three-cusped teeth and slender appearance with a flat, snake-like head. Like other Hexanchiformes, only a single, rear set dorsal fin is present. The anal fin is larger than this single dorsal fin, a combination unique to the frilled sharks (*Chlamydoselachus anguineus* & *C. africana*). It is worth noting that the majority of elasmobranchs have only five gill slits, while the Hexanchiformes have six or seven. Colouration is dark brown with no obvious patterning (Compagno, 1984).

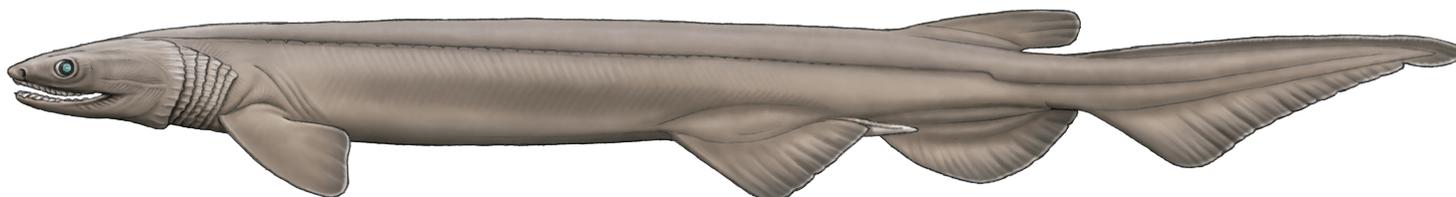
## SIMILAR SPECIES

*Hepranchias perlo*, Sharpnose Sevengill Shark

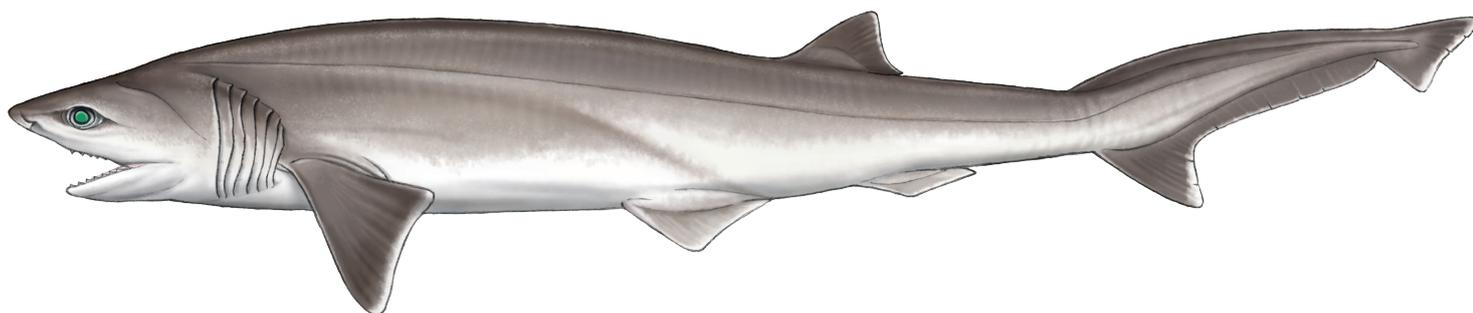
*Hexanchus nakamurai*, Bigeye Sixgill Shark



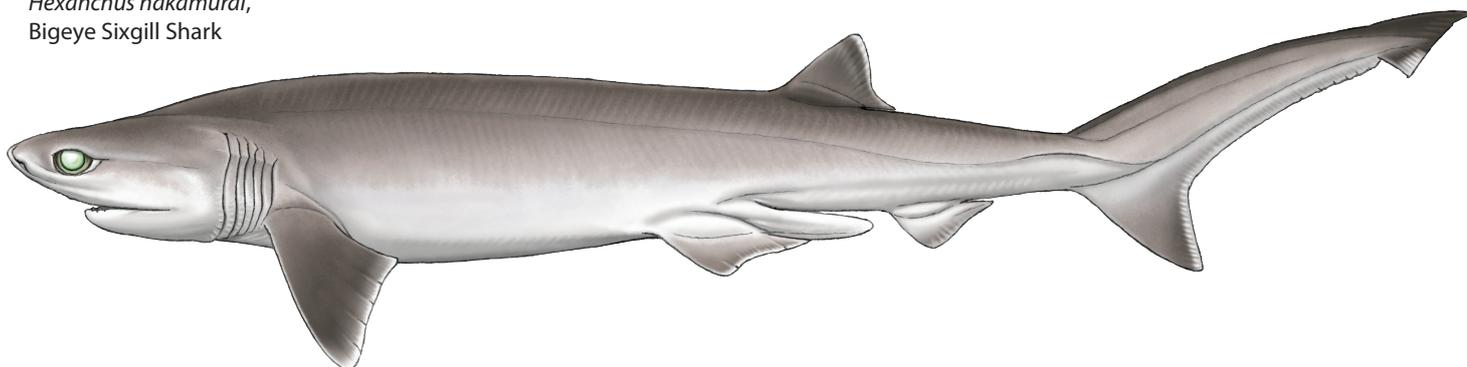
*Chlamydoselachus anguineus*,  
Frilled Shark



*Hepranchias perlo*,  
Sharpnose Sevengill Shark



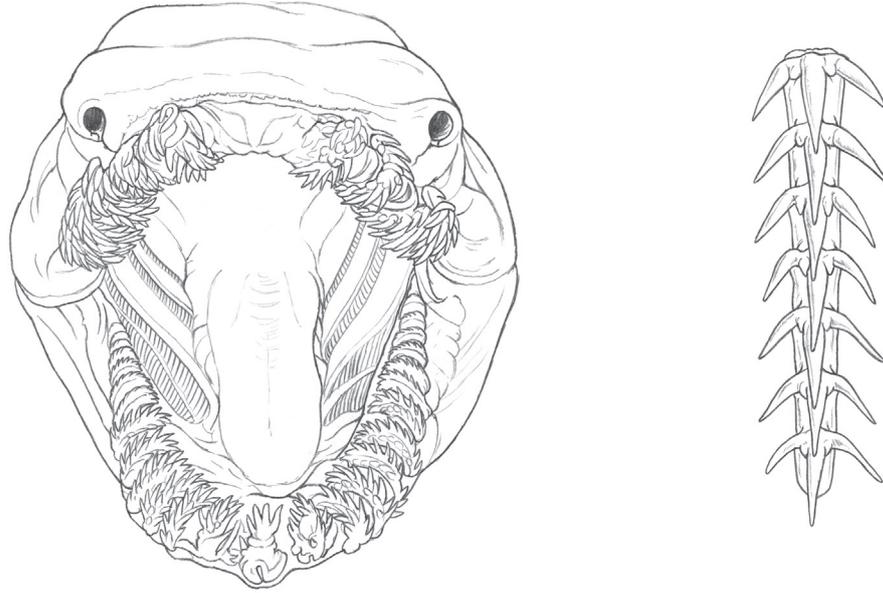
*Hexanchus nakamurai*,  
Bigeye Sixgill Shark



(Not to scale)

### TEETH

The teeth are distinctly tricuspid in both jaws. There is a pair of intermediate cusplets on each (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Frilled Shark is demersal or benthopelagic between 100 and 1,500 metres, most usually found between 500 and 1,000 metres. It is occasionally found pelagically (Paul and Fowler, 2003).

#### EGGCASE

N/A

#### DIET

The Frilled Shark is known to feed on deepwater squid and a variety of fish, including other sharks (Paul and Fowler, 2003).

#### REPRODUCTION

It is thought that male Frilled Sharks mature around 97-117cm in length. Females mature around 135-150cm in length. An ovoviparous species, there can be 6-12 pups in a litter which measure between 40 and 60cm in length at birth (Paul and Fowler, 2003). The gestation period is likely to be very long (1-2 years) but the life cycle is basically unknown (Compagno, 1984).

## COMMERCIAL IMPORTANCE

The Frilled Shark is taken occasionally as bycatch in deepwater trawl, longline and gillnet fisheries and either used for meat, fishmeal or discarded (Paul and Fowler, 2003).

## THREATS, CONSERVATION, LEGISLATION

Expanding deepwater fisheries across the range of the Frilled Shark are likely to have a negative impact on populations. Although little is known of its life history parameters, it is likely to mature late and have a long gestation period in common with other deepwater sharks. These factors make it extremely vulnerable to any increased pressure. There are currently no conservation measures in place for the Frilled Shark (Paul and Fowler, 2003).

## IUCN RED LIST ASSESSMENT

Near Threatened (2003).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Many needle-sharp teeth.
- Abrasive skin.

## REFERENCES

- COMPAGNO, L. J. V. 1984. Sharks of the World: An Annotated and Illustrated Catalogue of Shark Species Known to Date. Volume 4, Part 1. Hexanchiformes to Lamniformes. FAO. Rome, Italy.
- COMPAGNO, L., DANDO, M., FOWLER, S. 2005. Sharks of the World. HarperCollins Publishers Ltd. London, UK.
- PAUL, L., FOWLER, S. 2003. *Chlamydoselachus anguineus*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. www.iucnredlist.org.
- TANAKA, S., SHIOBARA, Y., HIOKI, S., ABE, H., NISHI, G., YANO, K., SUZUKI, K. 1990. The reproductive biology of the frilled shark, *Chlamydoselachus anguineus* from Suruga Bay, Japan. *Jap. J. Ichthyol.* Vol. 37 (3): 273–291.

Text: Richard Hurst.  
Illustrations: Marc Dando.

### Citation

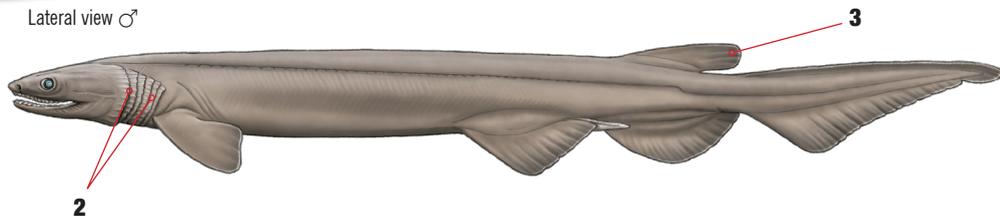
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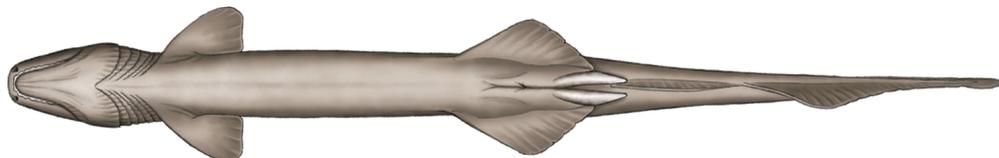
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Lateral view ♂



Ventral view ♂



## SCIENTIFIC NAME

*Chlamydoselachus anguineus* (Garman, 1884).

## DISTRIBUTION

Worldwide distribution but records incomplete. East Atlantic from Norway to at least northwest Africa. Confusion with the Southern African Frilled Shark, *Chlamydoselachus africana*, further south<sup>ii</sup>.



## COMMON NAME

**FRILLED SHARK**, Frill-Gilled Shark, Lizard Shark, Scaffold Shark, Silk Shark, Requin Lézard (Fr), Tiburón Anguila (Es).

## IDENTIFICATION

- 1 Thin, eel-like body and flattened, reptilian head.
- 2 Six large gill slits (1st pair joined ventrally) with frilled edges.
- 3 Single dorsal fin, smaller than anal fin<sup>i</sup>.

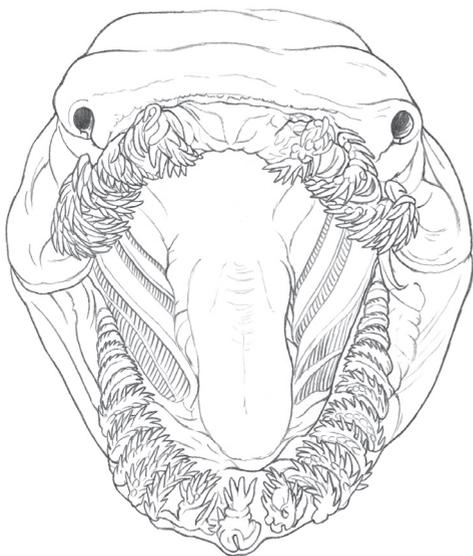
## COLOUR

- Deep brown to grey.
- No obvious pattern<sup>i</sup>.

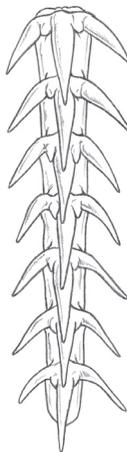
## BIOLOGY AND SIZE

- Born: 40–60cm<sup>iii</sup>. Mature: 130–135cm ♀, 92–163cm ♂<sup>ii</sup>. Max TL: 197cm<sup>i</sup>.
- Known to feed on deepwater squid and a variety of fish, including other sharks<sup>iii</sup>.
- Life history is basically unknown but the gestation period is likely to be long (1–2 years)<sup>i</sup> and litters of 6–12 pups have been recorded<sup>iii</sup>.
- Only the right uterus is functional<sup>iv</sup>. Embryos feed on huge uterine eggs<sup>ii</sup>.

## TEETH



- Tricuspid teeth in both jaws.
- Pair of intermediate cusplets on each!
- Clearly visible when the mouth is closed.



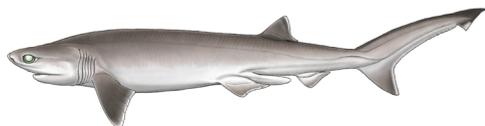
## SIMILAR SPECIES



- *Chlamydoselachus anguineus*, **Frilled Shark**



- *Heptranchias perlo*, **Sharpnose Sevengill Shark**



- *Hexanchus nakamurai*, **Bigeye Sixgill Shark**

## CONSERVATION STATUS

- Very few data although apparent low abundance and life history characteristics are likely to make it vulnerable to expanding deepwater fisheries<sup>iii</sup>.
- **Red List status:** Near Threatened (2003).

## COMMERCIAL IMPORTANCE

- Taken occasionally as bycatch in deepwater trawl, longline and gillnet fisheries.
- Usually discarded but the meat can be utilised and the carcass can be processed for fishmeal<sup>iii</sup>.

## HANDLING

- Handle with care.
- Many needle-sharp teeth.
- Abrasive skin.

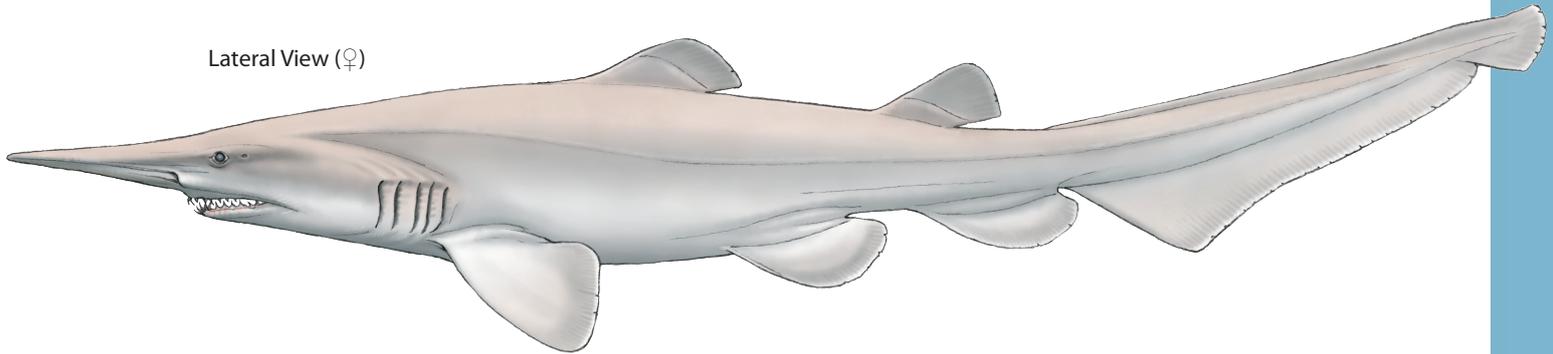
## REFERENCES

- Compagno, L. J. V.; 1984. FAO.
- Compagno, L. J. V. *et al*; 2005. HarperCollins Publishers.
- Paul, L. *et al*; 2003. IUCN Red List.
- Tanaka, S. Y. *et al*; 1990. *Jap. J. Ichthyol.*

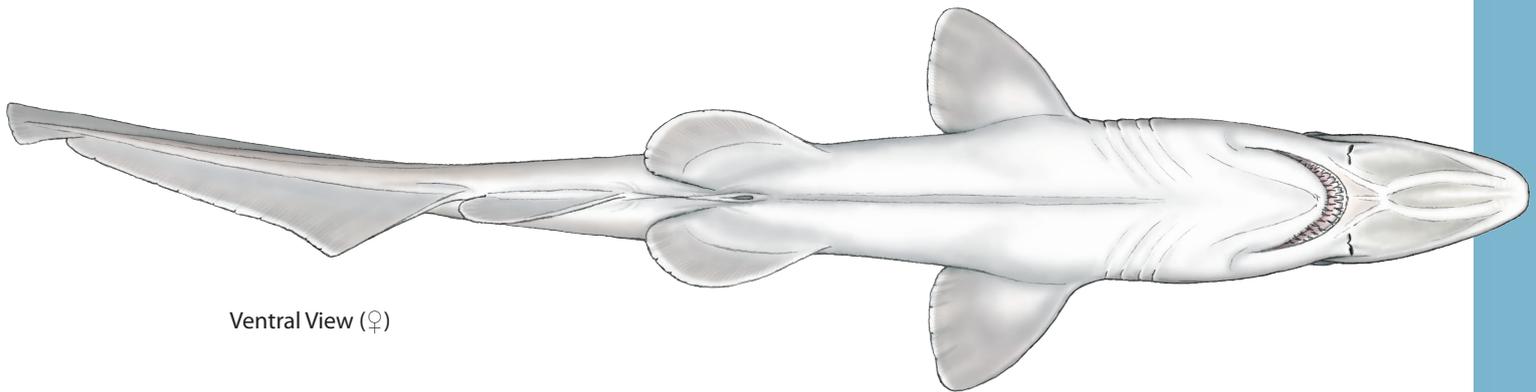
## HABITAT

- Demersal or benthopelagic, 100–1,500m. Most common 500–1,000m.
- Occasionally found pelagically<sup>iii</sup>.
- Confusion with the Southern African Frilled Shark, *Chlamydoselachus africana*, is likely on southwest African coasts<sup>i</sup>.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Goblin Shark**, Elfin Shark, Requin Lutin (Fr), Tiburón Duende (Es).

### SYNONYMS

*Scapanorhynchus owstoni* (Jordan, 1898), *Odontaspis nasutus* (de Braganza, 1904), *Scapanorhynchus jordani* (Hussakof, 1909), *Scapanorhynchus dofleini* (Engelhardt, 1912), *Scapanorhynchus mitsukurii* (White, 1937).

### DISTRIBUTION



The Goblin Shark has a wide but patchy distribution with occurrences in the Atlantic, Pacific and Indian Oceans. In the east Atlantic it is known from the Bay of Biscay to southern Portugal as well as Madeira, Senegal, the Gulf of Guinea and South Africa (Compagno, 2001).

### APPEARANCE

- Flat, blade-like, elongated snout.
- Tiny eyes.
- Five short, wide gill slits.
- Highly protrusible jaws, protrude upon death.
- Two spineless dorsal fins and an anal fin.
- Long caudal fin without ventral lobe.
- Pink-white with bluish fins. No distinguishing markings.
- Large, narrow, awl-shaped teeth. 26 uppers, 24 lowers.

The Goblin Shark is an unmistakable shark with a huge, flat snout and highly protrusible jaws. These jaws are controlled by a double set of ligaments at the mandibular joints. When retracted, these ligaments are stretched and function like a catapult when the jaws are released. This results in dead sharks having highly distinctive protruded jaws. (Jordan, Unknown). The eyes are tiny and the five gill slits are short, although they are wide and seem 'loose'. Two dorsal fins and an anal are present and there are no dorsal spines. The caudal fin is long and slender with no ventral lobe (Compagno, 2001).

The body is uniformly pale white or pinkish, caused by the blood vessels just under the translucent skin. The fins are bluish (Martin, Unknown). There are 26 upper teeth and 24 lower teeth. They are large, narrow, single-cusped and awl-shaped suggesting a diet of predominantly soft-bodied prey. The teeth further back are reduced (Jordan, Unknown).

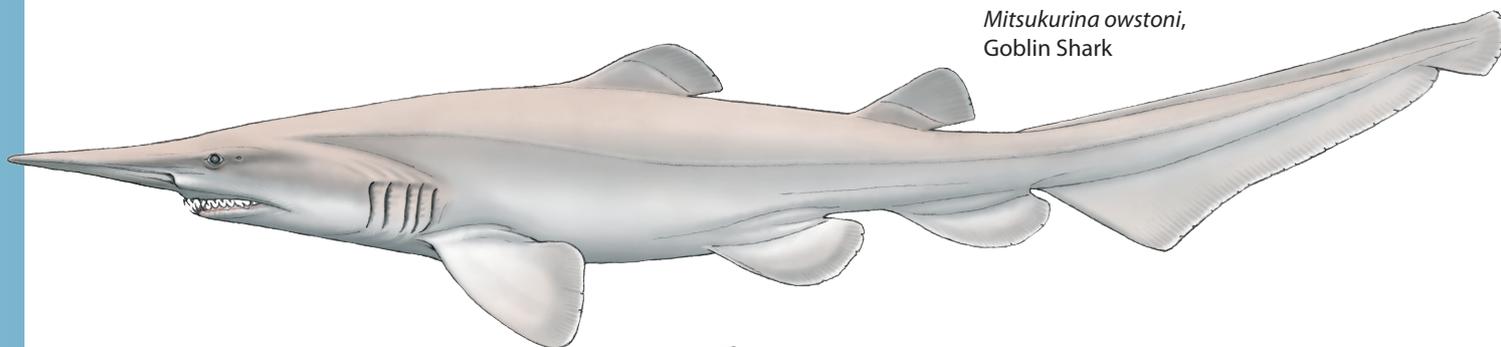
## SIMILAR SPECIES

*Carcharias taurus*, Sandtiger Shark

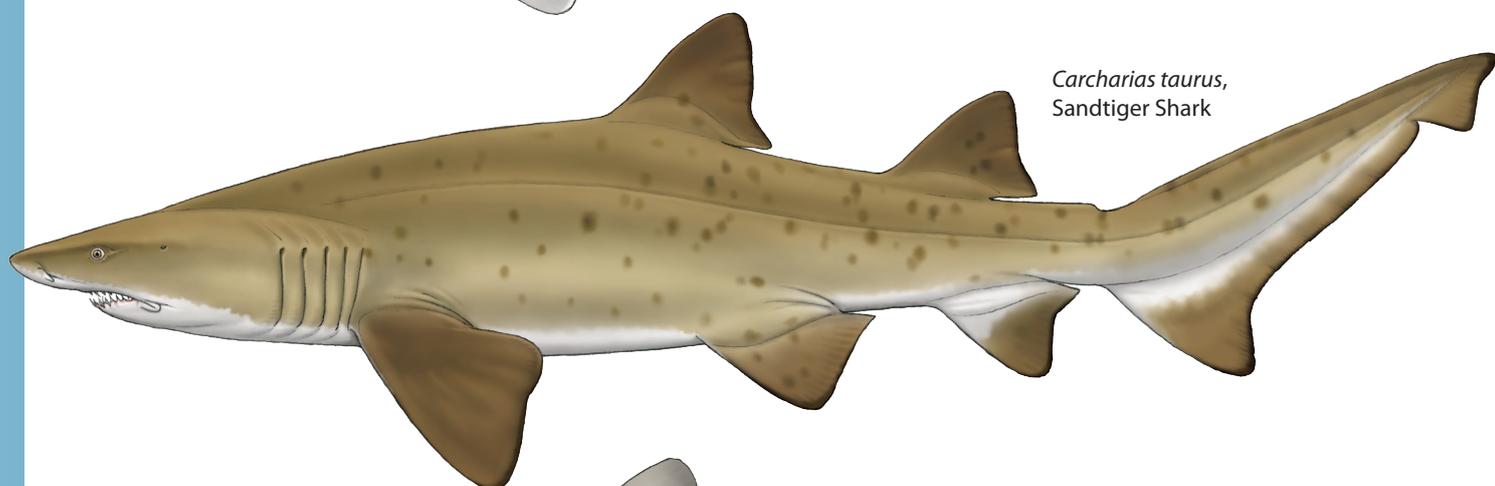
*Odontaspis ferox*, Smalltooth Sandtiger Shark

*Apristurus aphyodes*, White Ghost Catshark

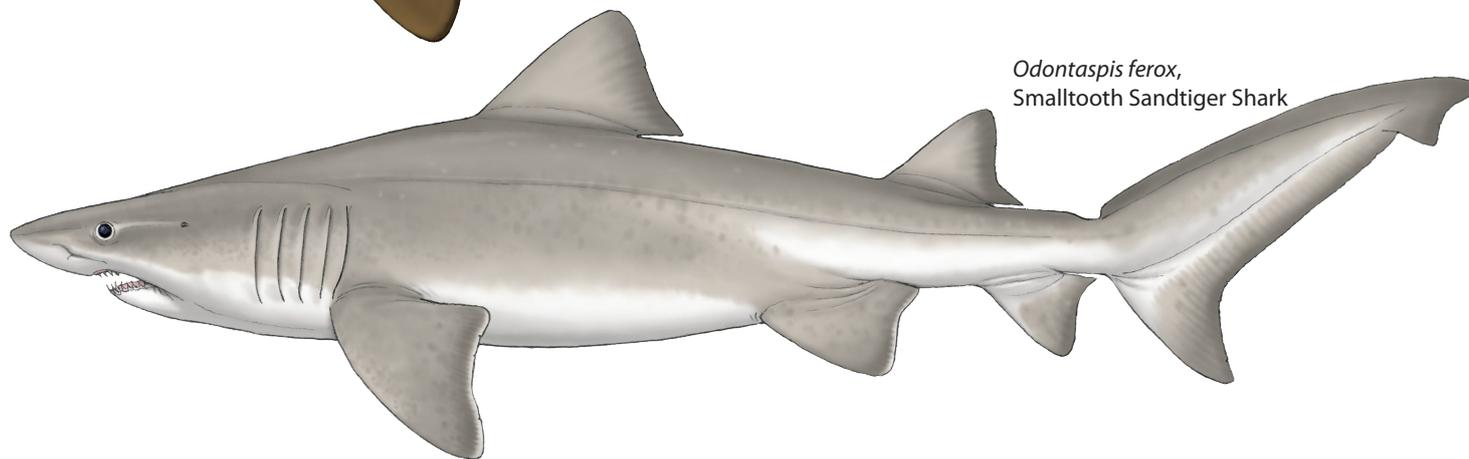
*Mitsukurina owstoni*,  
Goblin Shark



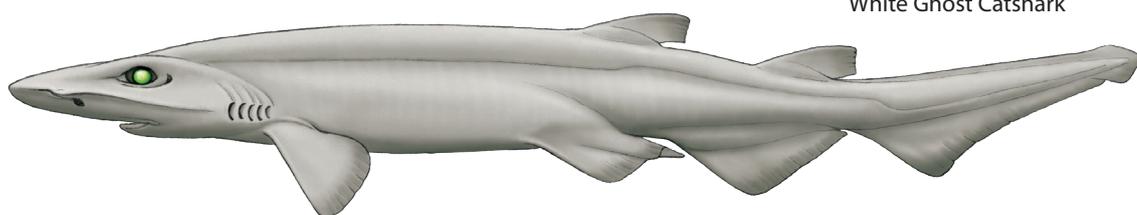
*Carcharias taurus*,  
Sandtiger Shark



*Odontaspis ferox*,  
Smalltooth Sandtiger Shark



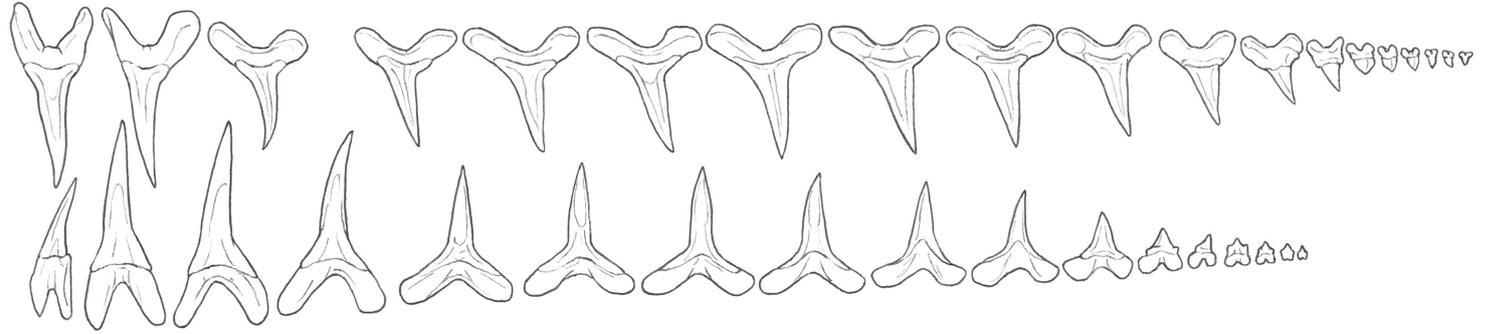
*Apristurus aphyodes*,  
White Ghost Catshark



(Not to scale)

### TEETH

The teeth are very long and narrow with single cusps in both jaws. There are 26 in the upper jaw and 24 in the lower jaw (Jordan, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Goblin Shark is a demersal and mesopelagic species on outer continental shelves, upper slopes and seamounts from 95–1,300m, although it is most common 270–960m. As the vast majority of those caught have been immature it has been suggested that the bulk of the population exists out of reach of commercial fisheries. It has been known to occur at the surface although this is extremely rare. Records from seamounts suggest that the species is also oceanic or semi-oceanic (Compagno, 2001).

#### EGGCASE

N/A

#### DIET

The dentition of the Goblin shark suggests that it eats soft bodied prey such as fish, shrimp and squid (Compagno, 2001). A large specimen taken near the surface off California had been feeding on squid. Juveniles taken off New Zealand and South Africa had been feeding on mid-water crustaceans, teleost fish and squid (Duffy et al., 2004).

#### REPRODUCTION

The life history and reproductive strategy of the Goblin Shark is poorly understood. Males become sexually mature at around 264cm total length. It is unknown at what size females become sexually mature. Extrapolating from knowledge of other members of the family, the embryos are probably nourished oophagously and the litter size is likely to be small. The smallest individual so far encountered was 88cm total length (Duffy *et al.*, 2004).

## COMMERCIAL IMPORTANCE

A rare bycatch of deepwater gillnet, longline and trawl fisheries, the Goblin Shark has little commercial value for traditional uses. The unusual jaws are sought by collectors however and can sell for US\$1,500-\$4,000, depending on the size and quality of the jaw (Duffy *et al.*, 2004).

## THREATS, CONSERVATION, LEGISLATION

A rare bycatch of deepwater fisheries, the biology and life history of the Goblin Shark are not well understood. In 2003, more than 100 were taken by fishermen off Taiwan in less than a week but it appears this is an isolated incident. Due to the small number of mature specimens taken as bycatch and the small numbers of animals encountered, it is believed the majority of the population exists beyond the range of commercial fisheries and is resistant to fishing pressure (Duffy *et al.*, 2004).

## IUCN RED LIST ASSESSMENT

Least Concern (2004).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

### REFERENCES

- COMPAGNO, L. J. V. 2001. Sharks of the World: An Annotated and Illustrated Catalogue of Shark Species Known to Date. Volume 2. Bullhead, Mackerel and Carpet Sharks (Heterodontiformes, Lamniformes and Orectolobiformes). FAO. Rome, Italy.
- DUFFY, C. A. J., EBERT, D. A., STENBERG, C. 2004. *Mitsukurina owstoni*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.1. [www.iucnredlist.org](http://www.iucnredlist.org).
- JORDAN, V. Unknown. Goblin Shark. Florida Museum of Natural History. [www.flmnh.ufl.edu/fish/](http://www.flmnh.ufl.edu/fish/).
- MARTIN, R. A. Unknown. Biology of the Goblin Shark (*Mitsukurina owstoni*). ReefQuest Centre for Shark Research. [www.elasmo-research.org](http://www.elasmo-research.org).

Text: Richard Hurst.  
Illustrations: Marc Dando.

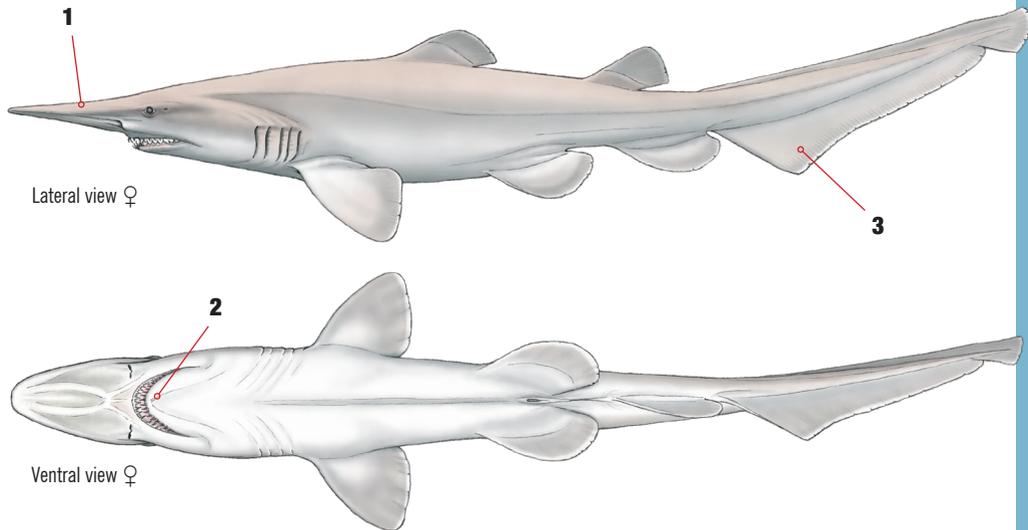
#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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Lateral view ♀

Ventral view ♀

### SCIENTIFIC NAME

*Mitsukurina owstoni* (Jordan, 1898).

### DISTRIBUTION

Widely distributed but little known. Found in the northeast Atlantic from the Bay of Biscay, Portugal and Madeira<sup>1</sup>.



### COMMON NAME

**GOBLIN SHARK**, Elfin Shark, Requin Lutin (Fr), Tiburón Duende (Es).

### IDENTIFICATION

- 1 Distinctive flat, elongated snout.
- 2 Long, protrusible jaws, extended when dead.
- 3 No ventral caudal lobe<sup>1</sup>.

### COLOUR

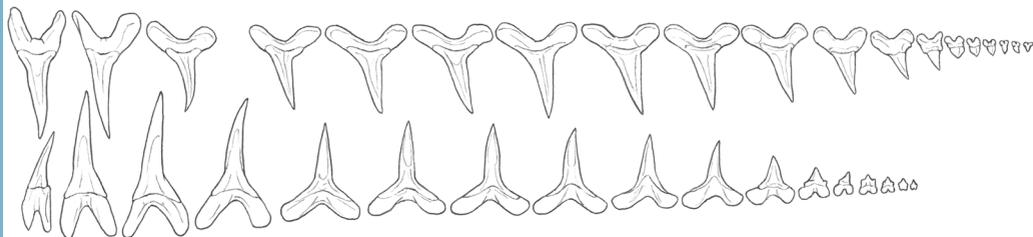
- Pinkish white when living.
- Blue tint to fins.
- Adults darker than juveniles<sup>iii</sup>.

### BIOLOGY AND SIZE

- Born: ~88cm, Mature: <335cm ♂, <264cm ♀, Max TL: 540–617cm (est.)<sup>iii</sup>.
- Protrusible jaws are held in against elastic ligaments whilst swimming and are released rapidly forward when capturing prey.
- Nothing is known of its reproduction or diet, although it is believed to be ovoviviparous and its dentition suggests soft bodied prey<sup>iii</sup>.

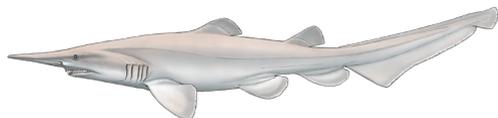


## TEETH

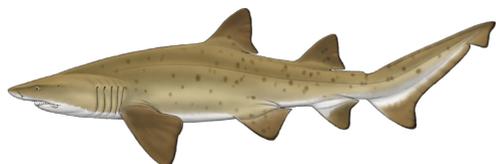


- Very long, narrow, single-cusped teeth in both jaws.
- 26 in the upper jaw, 24 in the lower<sup>iii</sup>.

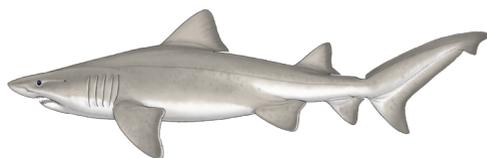
## SIMILAR SPECIES



*Mitsukurina owstoni*, **Goblin Shark**



*Carcharias taurus*, **Sandtiger Shark**



*Odontaspis ferox*, **Smalltooth Sandtiger Shark**



*Apristurus aphyodes*, **White Ghost Catshark**

## HABITAT

- Continental shelves and upper slopes to at least 1,000m. Rarely encountered in shallow water (<30m)<sup>ii</sup>.
- Fin arrangement suggests it is slow swimming and inactive<sup>i</sup>.

## CONSERVATION STATUS

- Although apparently rare, it has a wide distribution and is infrequently taken by fisheries<sup>ii</sup>.
- Red List status:** Least Concern (2004).

## COMMERCIAL IMPORTANCE

- Rare bycatch of deepwater fisheries using gillnets, longlines and trawls. Has also been found tangled in crab pot lines.
- Meat, fins, hides and livers may be utilised but this is not common.
- Jaws are valued by collectors and can be worth US \$1,500–4,000<sup>ii</sup>.

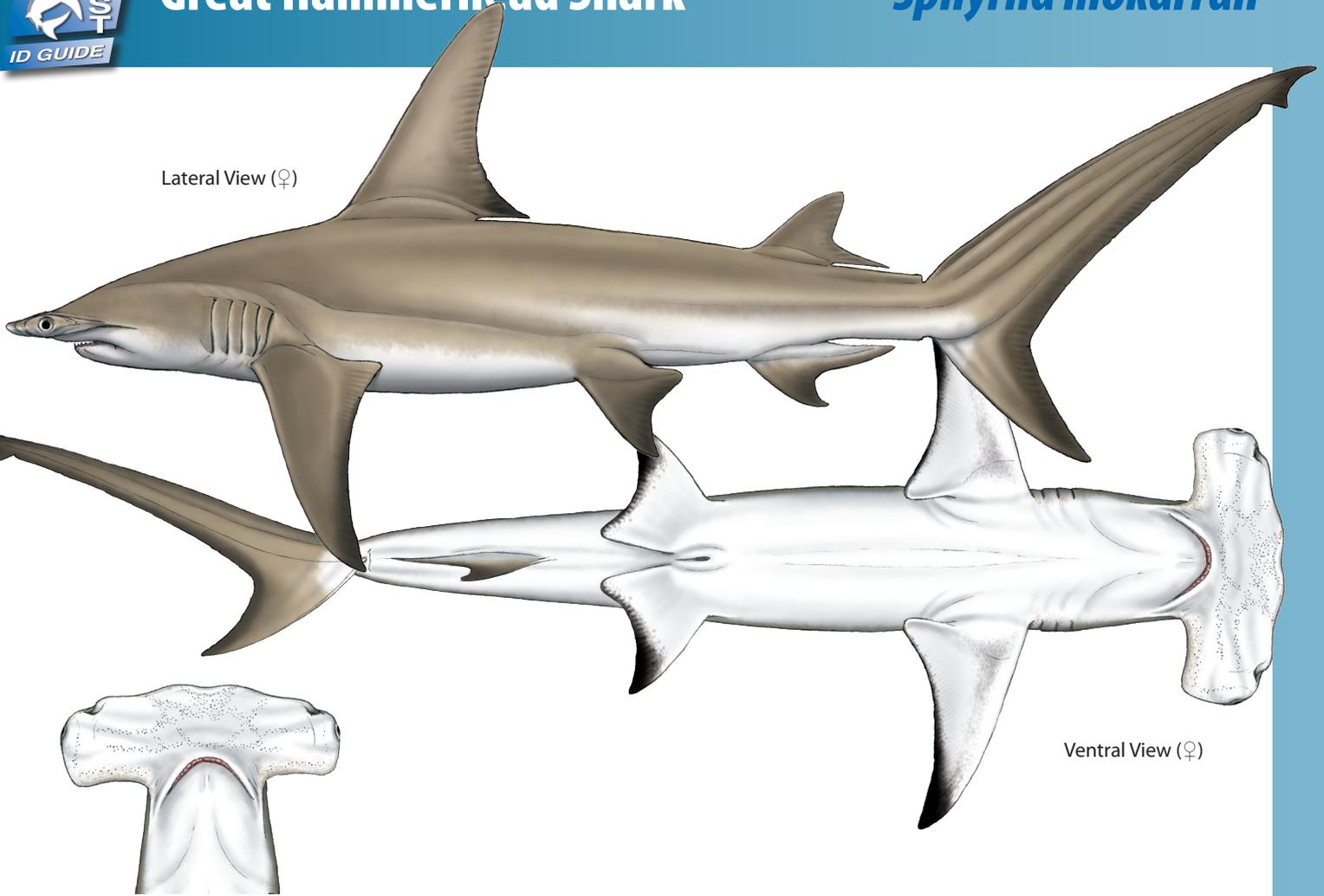
## HANDLING

- Handle with care.
- Needle-sharp teeth.
- Abrasive skin.

## REFERENCES

- Compagno, L. J. V.; 1984. FAO.
- Duffy, C. A. J. *et al*; 2004. IUCN Red List.
- Jordan, V; Unknown. FLMNH.

Lateral View (♀)



Ventral View (♀)

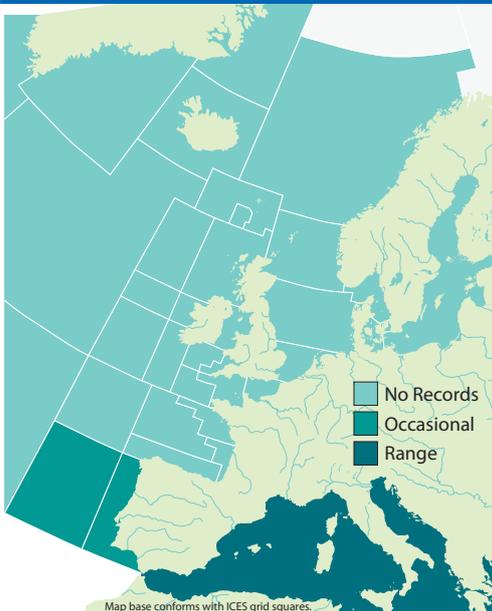
### COMMON NAMES

**Great Hammerhead Shark**, Squat-headed Hammerhead, Grand Requin-Marteau (Fr), Cornuda Gigante (Es).

### SYNONYMS

*Zygaena mokarran* (Rüppell, 1837), *Zygaena dissimilis* (Murray, 1887), *Sphyrna ligo* (Fraser-Brunner, 1950).

### DISTRIBUTION



The Great Hammerhead Shark is a virtually circum-global species in tropical and warm temperate coastal waters. In the east Atlantic it is found in Morocco and Senegal, possibly to Guinea and throughout the Mediterranean Sea (Compagno, 1984).

### APPEARANCE

- Anterior margin of head nearly straight.
- Deep median indentation.
- Indentations on each side of the head before eye.
- First dorsal fin extremely large and strongly falcate.
- High second dorsal fin with a strongly concave rear margin.
- Falcate pelvic fins.
- Deeply notched posterior anal margin.
- Dark brown to light grey or olive dorsally.
- Fades to white ventrally.
- No fin markings in adults.
- Juveniles may have dusky second dorsal fin tips.
- Maximum total length 550-610cm. Most adults not above 366cm.

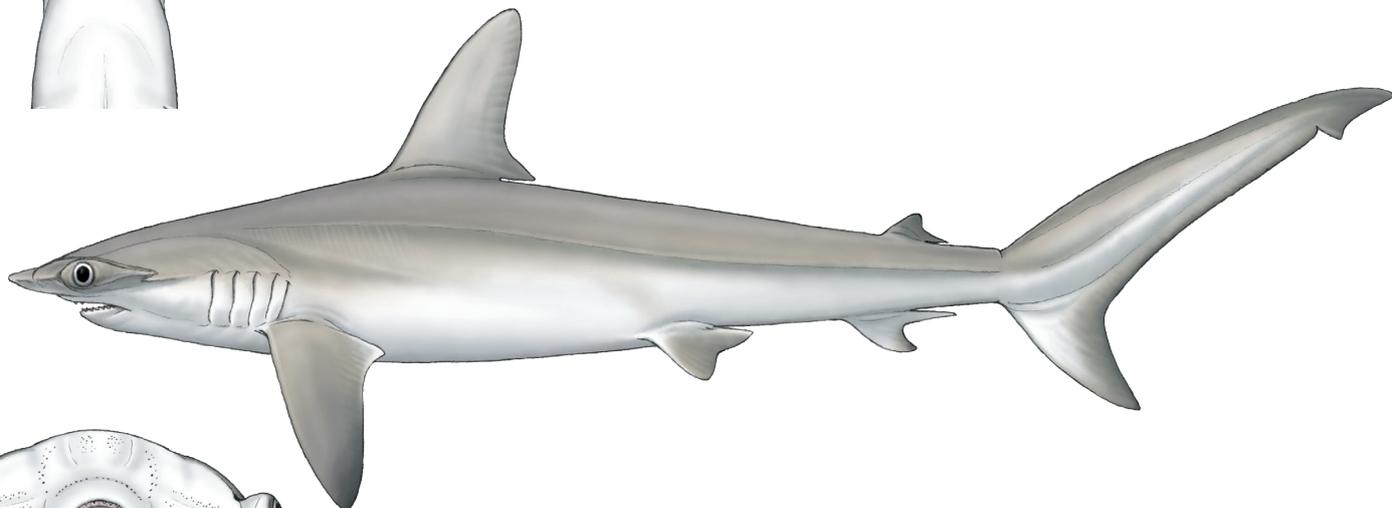
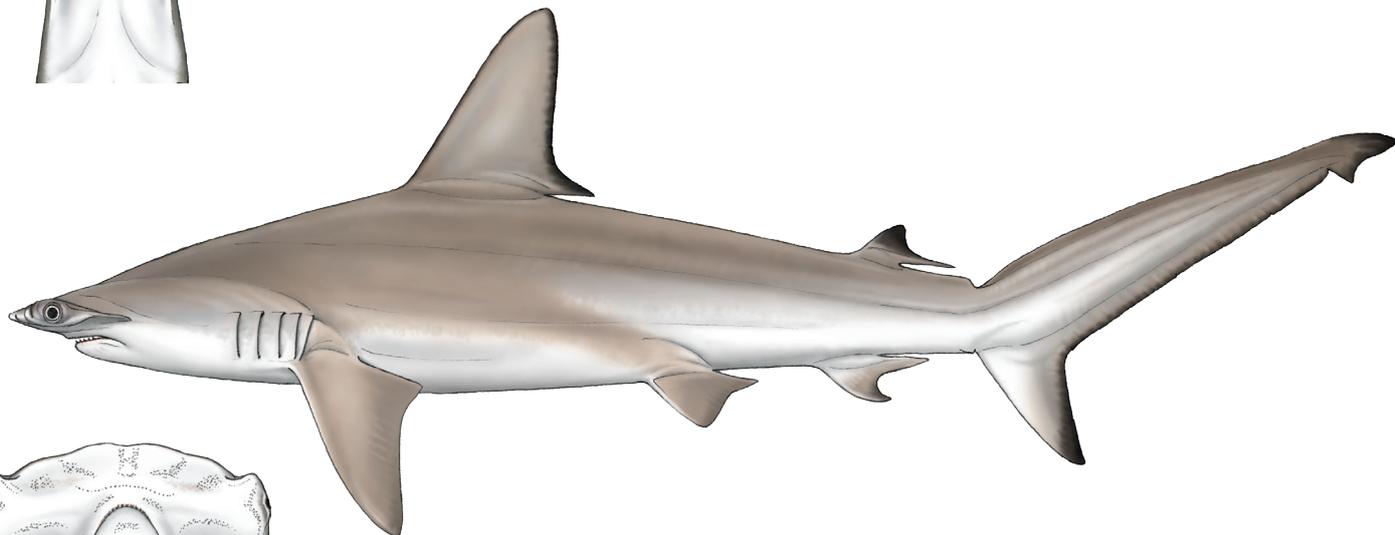
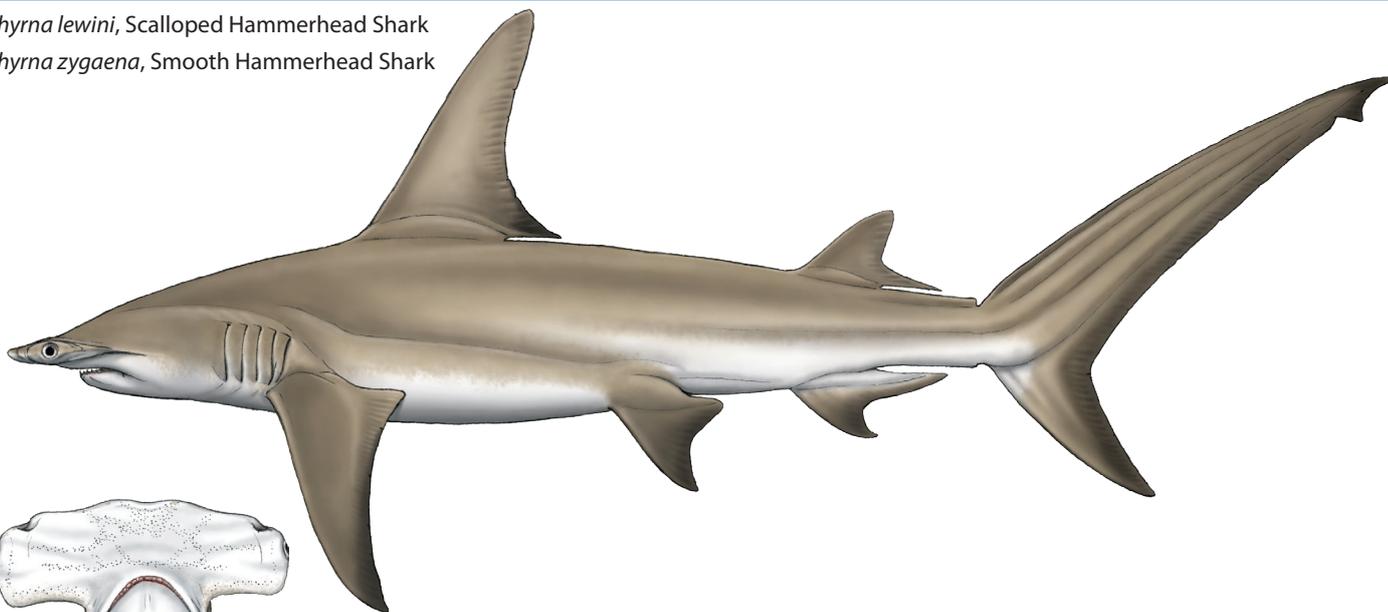
The Great Hammerhead Shark is a large shark with an unmistakable head shape and first dorsal fin. The leading edge of the cephalophoil has a median indentation and an indentation on each side of the head before the eye. The first dorsal fin is extremely high and strongly falcate, the second dorsal fin is also relatively high with a strongly concave rear margin. The pelvic fins are falcate and the posterior anal margin is deeply notched (Compagno, 1984).

Dorsally it is dark brown to light grey or olive. This fades to white ventrally. There are no fin markings in adults but juveniles may have a dusky second dorsal fin tip (Bester, Unknown). The maximum total length is 550-610cm, although the majority of adults of both sexes do not exceed 366cm (Compagno, 1984).

## SIMILAR SPECIES

*Sphyrna lewini*, Scalloped Hammerhead Shark

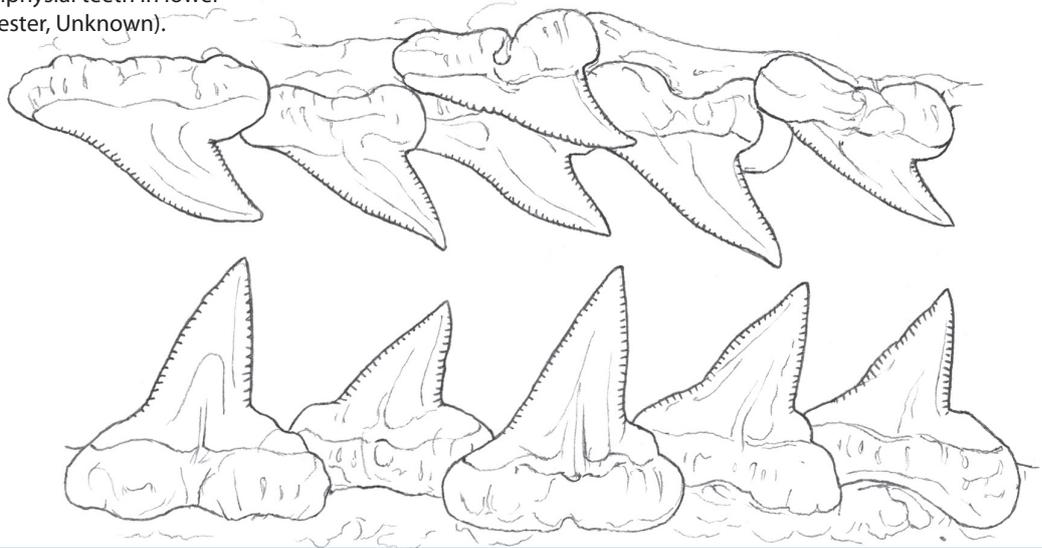
*Sphyrna zygaena*, Smooth Hammerhead Shark



(Not to scale)

### TEETH

The teeth are triangular and strongly serrated in both jaws. There are 2–3 symphyseal teeth in upper jaw with 17 teeth each side. There are 1–3 symphyseal teeth in lower jaw with 16–17 teeth each side (Bester, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

Predominantly a coastal shark over continental shelves and lagoons, the Great Hammerhead Shark can be found far offshore to depths of at least 300m. It migrates seasonally, moving towards the poles and cooler waters during the summer months and returning towards the equator during the winter (Bester, Unknown).

#### EGGCASE

N/A

#### DIET

An opportunistic predator, the Great Hammerhead Shark seems to prefer stingrays and other batoids, groupers and sea catfishes. Tarpons, sardines, toadfish, porgies, grunts, jacks, croakers, serranids, tongue-soles, boxfishes, porcupine fishes, smooth-hounds (*Mustelus* spp.) and other sharks, guitarfish, skates, stingrays, cownosed rays, crabs and squid have also been recorded. It appears not to be fazed by the stings of stingrays and catfish and they are often found embedded in its buccal cavity. One individual had around 50 spines in its mouth, throat and tongue (Compagno, 1984).

#### REPRODUCTION

Female Great Hammerhead Sharks mature at a total length of around 210cm, males larger at around 225cm. During the 11 month gestation period the embryos are nourished through a yolk-sac placenta. Parturition occurs during the spring or summer months with litters of 6–42 pups produced, each of which measures 60–70cm total length. The head of these pups is more rounded than that of the adults. Reproduction is biennial. Unlike most shark species, the Great Hammerhead Shark may routinely mate in the water column. Pairs have been observed ascending during courtship before mating at the surface (Bester, Unknown).

## COMMERCIAL IMPORTANCE

The Great Hammerhead Shark is taken as bycatch and as a target species in longline, fixed bottom net, hook-and-line and pelagic and bottom trawl fisheries. Its fins are highly prized for sharkfin soup, its flesh can be used fresh or preserved for human consumption, its hide can be used for leather, its liver for vitamin rich oil and its carcass can be processed for fishmeal (Denham *et al.*, 2007).

## THREATS, CONSERVATION, LEGISLATION

The Great Hammerhead Shark is a large, low fecundity coastal species with highly prized fins and high bycatch mortality. As such it is extremely vulnerable to fisheries pressure. In the east Atlantic, population declines of 80% may have occurred in 25 years. In the Gulf of Mexico and northwest Atlantic, declines of at least 90% have occurred and discard mortality is thought to be as high as 90%. In the southwest Indian Ocean, declines in catches of 79% were reported between 1978 and 2003. Its status elsewhere is difficult to quantify due to problems in species identification and illegal, unregulated and unreported fishing, but significant declines are likely to have occurred (Denham *et al.*, 2007).

## IUCN RED LIST ASSESSMENT

Endangered (2007).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Powerful jaws and sharp teeth.
- Abrasive skin.

### REFERENCES

- BESTER, C. Unknown. Great Hammerhead. Florida Museum of Natural History. [www.flmnh.ufl.edu/fish/](http://www.flmnh.ufl.edu/fish/).
- COMPAGNO, L. J. V. 1984. FAO Species Catalogue, Vol. 4, Part 1: Sharks of the World. An Annotated and Illustrated Catalogue of Shark Species Known to Date. FAO. Rome, Italy.
- DENHAM, J., STEVENS, J., SIMPFENDORFER, C. A., HEUPEL, M. R., CLIFF, G., MORGAN, A., GRAHAM, R., DUCROCQ, M., DULVY, N. D., SEISAY, M., ASBER, M., VALENTI, S. V., LITVINOV, F., MARTINS, P., LEMINE OULD SIDI, M., TOUS, P., BUCAL, D. 2007. *Sphyrna mokarran*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.1. [www.iucnredlist.org](http://www.iucnredlist.org).

Text: Richard Hurst.  
Illustrations: Marc Dando.

#### Citation

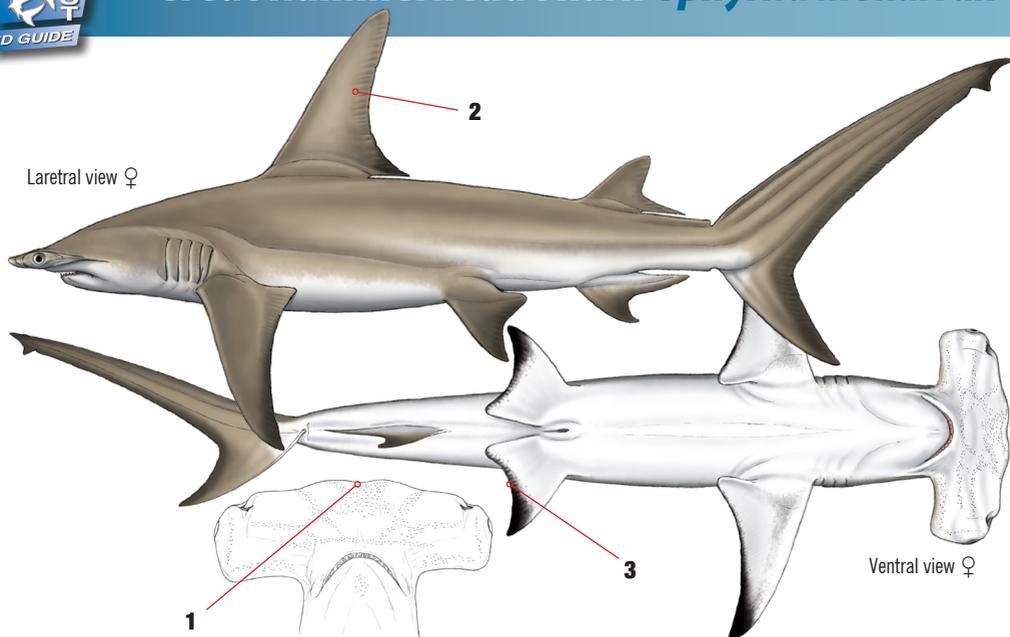
Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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# Great Hammerhead Shark *Sphyrna mokarran*



Lateral view ♀

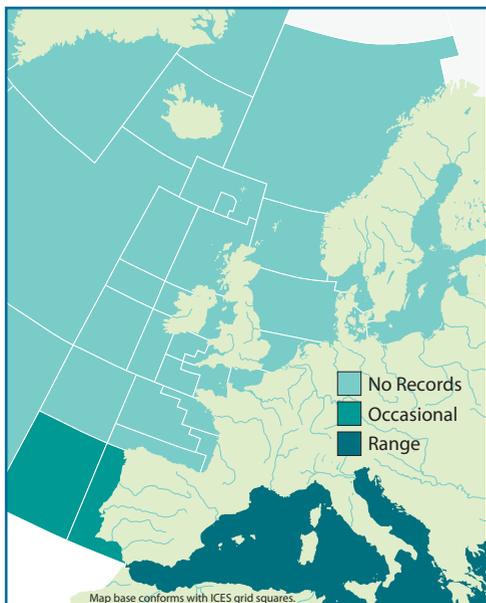
Ventral view ♀

## SCIENTIFIC NAME

*Sphyrna mokarran* (Rüppell, 1837).

## DISTRIBUTION

Circumtropical, extending into warm temperate waters. East Atlantic from the Mediterranean to Senegal, possibly Gambia and Guinea<sup>ii</sup>.



## COMMON NAME

**GREAT HAMMERHEAD SHARK**, Squat-headed Hammerhead, Grand Requin-Marteau (Fr), Cornuda Gigante (Es).

## IDENTIFICATION

- 1** Anterior margin of head nearly straight with a weak median indentation.
- 2** Extremely tall, curved, first dorsal fin.
- 3** Rear margins of pelvic fins concave<sup>i</sup>.

## COLOUR

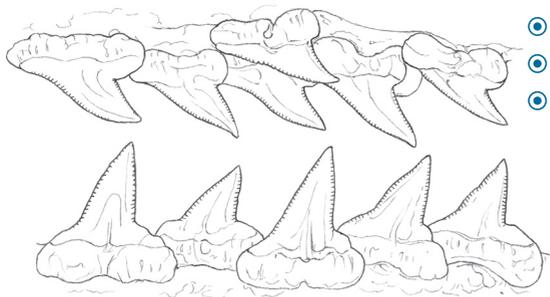
- Dark brown to light grey or olive dorsally.
- Fades to white ventrally.
- May be dusky markings on fin tips, more pronounced in juveniles<sup>i</sup>.

## BIOLOGY AND SIZE

- Born: 50–70cm. Mature: 250–300cm ♀, 234–269cm ♂. Max TL: >550–610cm<sup>iii</sup>.
- Litters of 6–42 pups have been recorded after a gestation period of 7–11 months<sup>i</sup>. Reproduce biennially<sup>iii</sup>.
- Preys on a wide variety of teleost and elasmobranch fish, with stingrays and other batoids prominent among stomach contents. Also takes cephalopods, molluscs and crustaceans<sup>ii</sup>.

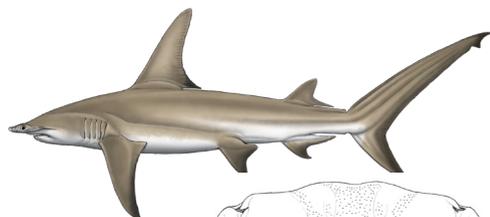


## TEETH

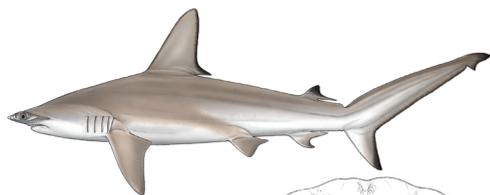
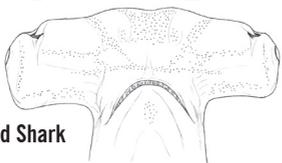


- Triangular and strongly serrated in both jaws.
- 2–3 symphyseal teeth in upper jaw with 17 each side.
- 1–3 symphyseal teeth in lower jaw with 16–17 each side!

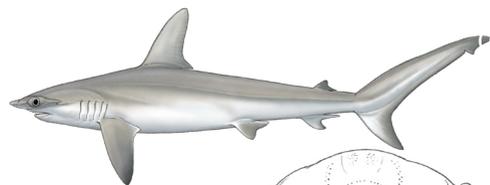
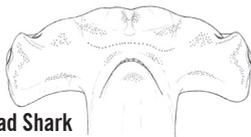
## SIMILAR SPECIES



- *Sphyrna mokarran*,  
Great Hammerhead Shark



- *Sphyrna lewini*,  
Scalloped Hammerhead Shark



- *Sphyrna zygaena*,  
Smooth Hammerhead Shark



## HABITAT

- From near-surface to at least 80m. Close inshore to well offshore.
- Recorded from continental shelves, island terraces, in passes and lagoons of coral atolls and over deep water.
- Apparently nomadic and migratory, it does not form large schools in the manner of the Scalloped Hammerhead Shark, *Sphyrna lewini*<sup>ii</sup>.

## CONSERVATION STATUS

- Suffers very high bycatch mortality and only reproduces every two years making it vulnerable to population depletion. Serious declines have been observed across much of its range<sup>iii</sup>.
- **Red List status:** Endangered (2007).

## COMMERCIAL IMPORTANCE

- Mainly a bycatch species but highly valued for its fins meaning many are retained.
- The meat is rarely consumed by humans but hides, livers and carcasses are all utilised<sup>iii</sup>.
- Popular game fish with recreational anglers due to its large size, particularly off the east coast of the USA<sup>i</sup>.

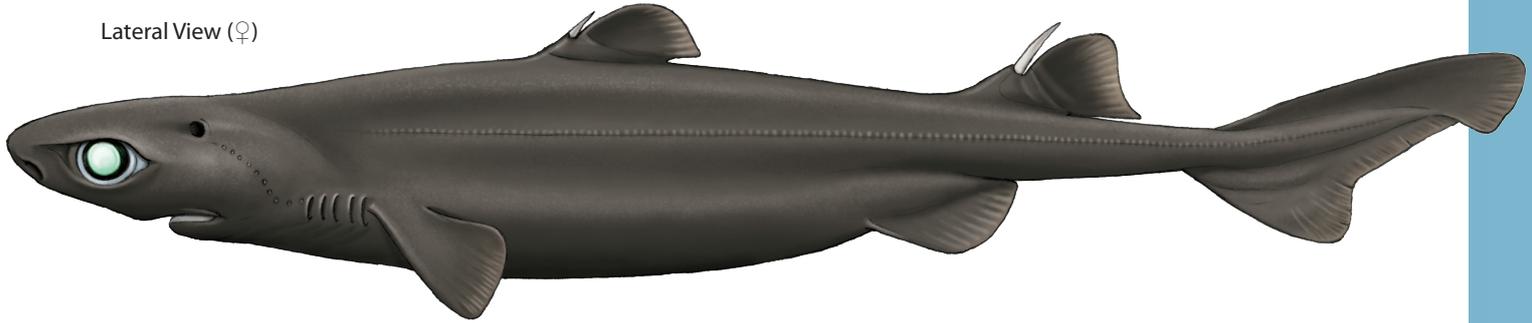
## HANDLING

- Handle with care.
- Powerful jaws and sharp teeth.
- Abrasive skin.

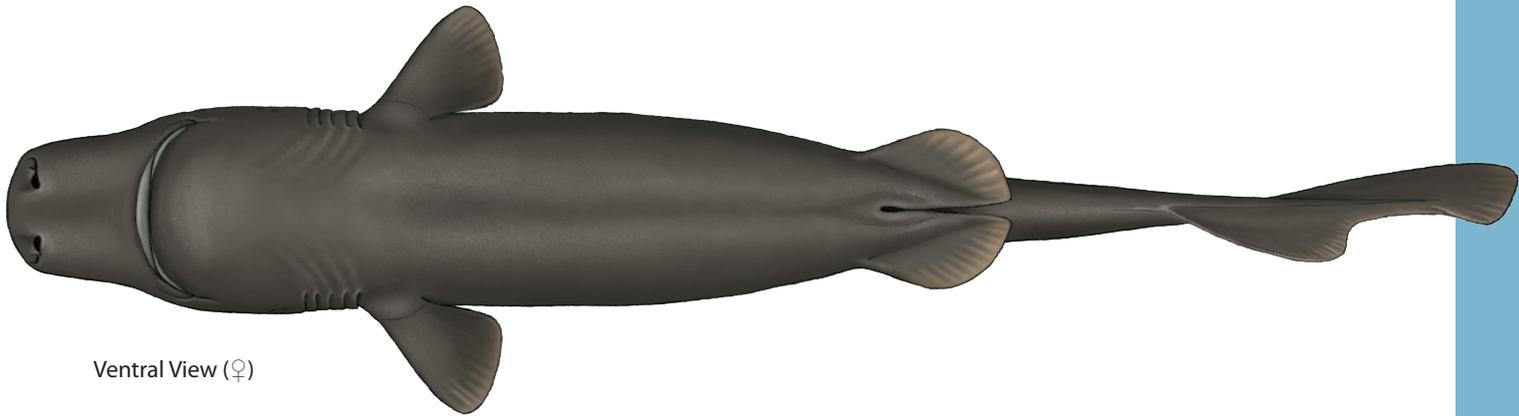
## REFERENCES

- i. Bester, C; Unknown. FLMNH.
- ii. Compagno, L. J. V; 1984. FAO.
- iii. Denham, J. et al; 2007. IUCN Red List.

Lateral View (♀)



Ventral View (♀)



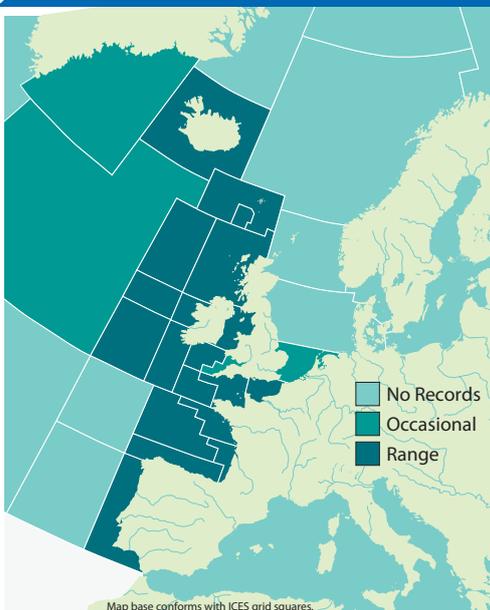
### COMMON NAMES

Great Lanternshark, Sagre Rude (Fr), Tollo Lucero Raspa (Es).

### SYNONYMS

None.

### DISTRIBUTION



In the east Atlantic, the Great Lanternshark is encountered from southern Iceland to at least Gibraltar and possibly as far as Mauritania. It is also found in the west Atlantic. It has been reported from the Kyushu-Palau Ridge in the Pacific. If this identification is correct it constitutes a considerable range expansion (Compagno, 1984).

### APPEARANCE

- Short snout.
- First dorsal fin set well behind pectoral fins.
- Second dorsal fin larger than first.
- Both dorsal fins have well developed spines.
- No anal fin.
- Moderately long, thick upper caudal fin.
- Lateral trunk denticles with thick cups.
- Uniformly blackish in colour.

The Great Lanternshark is the largest species of *Etmopterus* and can be distinguished from the other 30 species by its lateral trunk denticles, which are well developed with fairly thick cups (Freitas and Biscotto, 2007).

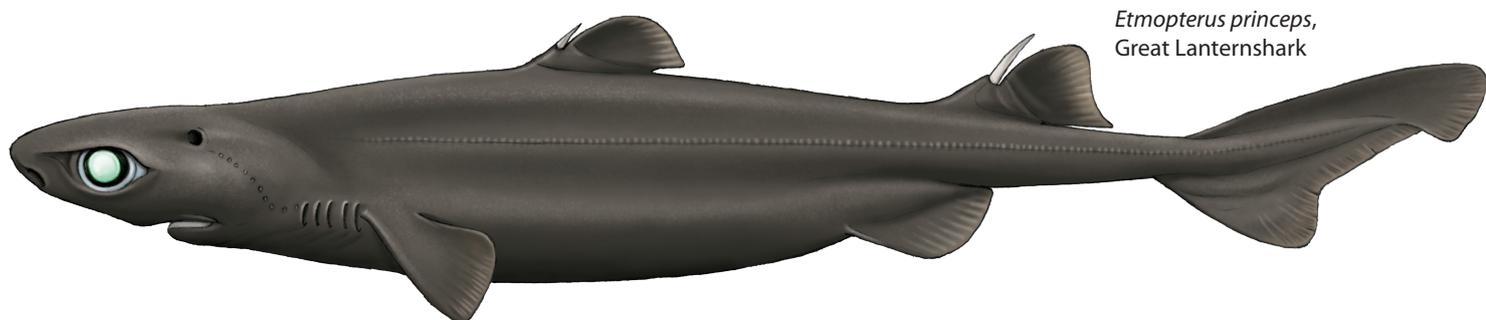
It is a stocky shark with a short snout. The first dorsal fin is set well behind the pectoral fins. The second is set behind the pelvic fins and is slightly larger than the first. Both have large, well developed spines associated. There is no anal fin. The dorsal lobe of the caudal fin is moderately long and thick. The ventral lobe is smaller. The colouration is a uniform blackish with no pattern. The maximum recorded length is 75cm (Compagno, 1984).

## SIMILAR SPECIES

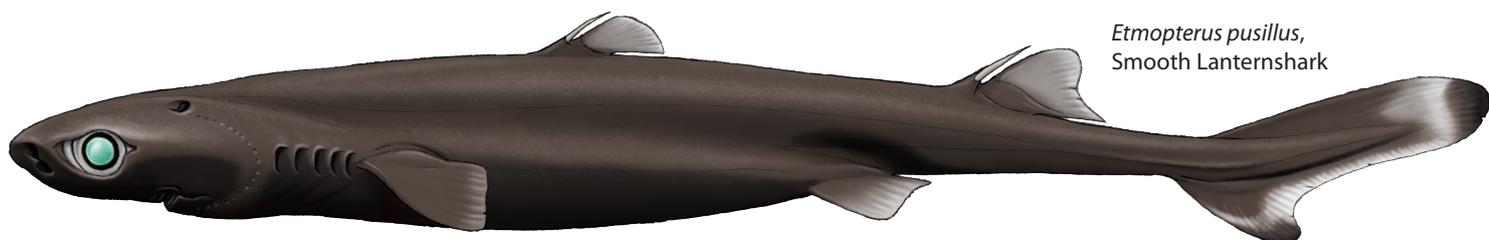
*Etmopterus pusillus*, Smooth Lanternshark

*Etmopterus spinax*, Velvet Belly Lanternshark

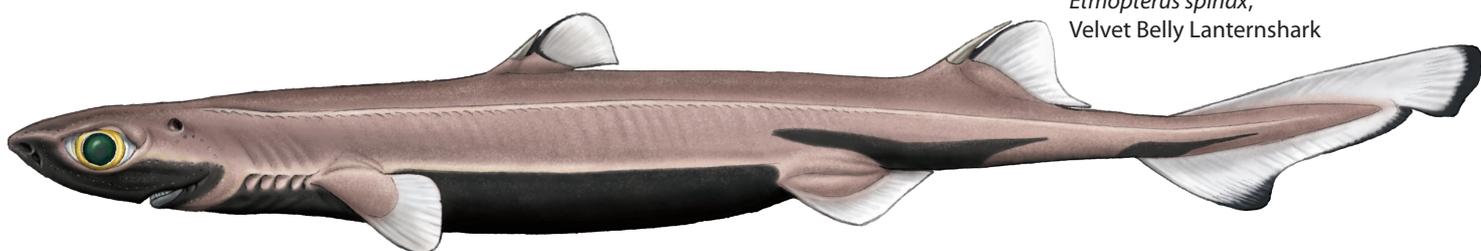
*Centroscyllium fabricii*, Black Dogfish



*Etmopterus princeps*,  
Great Lanternshark



*Etmopterus pusillus*,  
Smooth Lanternshark



*Etmopterus spinax*,  
Velvet Belly Lanternshark

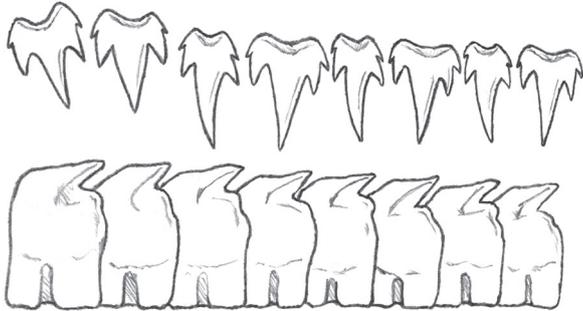


*Centroscyllium fabricii*,  
Black Dogfish

(Not to scale)

### TEETH

There are generally less than three pairs of cusplets on the upper teeth (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Great Lanternshark is found on the continental slope from 350 to 2,213 metres and on the lower continent rise of the northeast Atlantic from 3,750 to 4,500m (Herndon and Burgess, 2007). Very little else is known, although some studies have suggested that it may segregate by size, with smaller specimens found in deeper water (Jakobsdóttir, 2001).

#### EGGCASE

N/A

#### DIET

Unknown.

#### REPRODUCTION

Males reach sexual maturity at around 55cm in length, the size at maturity for females is unknown (Herndon and Burgess, 2007). It is an ovoviviparous species (Carpenter, 2009). Nothing else is known.

## COMMERCIAL IMPORTANCE

The Great Lanternshark may be fished in the northeast Atlantic but details are uncertain. It is presumably taken as bycatch in deep-sea mixed trawl fisheries (Herndon and Burgess, 2007).

## THREATS, CONSERVATION, LEGISLATION

The Great Lanternshark is subject to bycatch mortality across its range and may be under considerable fishing pressure. However, species specific information is not available. Given that its biology and population status are essentially unknown, the impacts anthropogenic pressure is having on the species cannot be quantified and may be significant (Herndon and Burgess, 2007).

In ICES sub-areas V, VI, VII, VIII and IX a Total Allowable Catch (TAC) of 1,646 tons (2008) applies to the deepwater sharks *Centroscymnus coelolepis*, *Centrophorus granulosus*, *C. squamosus*, *Deania calceus*, *Dalatias licha*, *Etmopterus princeps*, *E. spinax*, *Centrosyllium fabricii*, *Galeus melastomus*, *G. murinus* and all *Apristurus* spp. Additionally, these species have a TAC of 20 tons in sub-area X and a TAC of 49 tons (including *Deania histricosa* and *D. profundorum*) in sub-area XII (CPOA Shark, 2009).

## IUCN RED LIST ASSESSMENT

Data Deficient (2005).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large dorsal spines.
- Abrasive skin.

### REFERENCES

- CARPENTER, K. E. 2009. *Etmopterus princeps*. FishBase. [www.fishbase.org](http://www.fishbase.org).
- COMPAGNO, L. J. V. 1984. Sharks of the World: An Annotated and Illustrated Catalogue of Shark Species Known to Date. Volume 4, Part 1. Hexanchiformes to Lamniformes. FAO. Rome, Italy.
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- COTTON, C. 2009. Personal Communication.
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- FREITAS, M., BISCOTTO, M. 2007. Four Chondrichthyes New for the Archipelago of Madeira and Adjacent Seamounts (N.E. Atlantic Ocean). *Museu Municipal do Funchal (História Natural)*. 31. XII. No. 221.
- HERNDON, A. P., BURGESS, G. H. 2006. *Etmopterus princeps*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. [www.iucnredlist.org](http://www.iucnredlist.org).
- JAKOBSDÓTTIR, K. B. 2001. Biological aspects of two deep-water squalid sharks: *Centroscyllium fabricii* (Reinhardt, 1825) and *Etmopterus princeps* (Collett, 1904) in Icelandic waters. *Fisheries Research*, 51 (2-3): 247-265.

Text: Richard Hurst.  
Illustrations: Marc Dando.

#### Citation

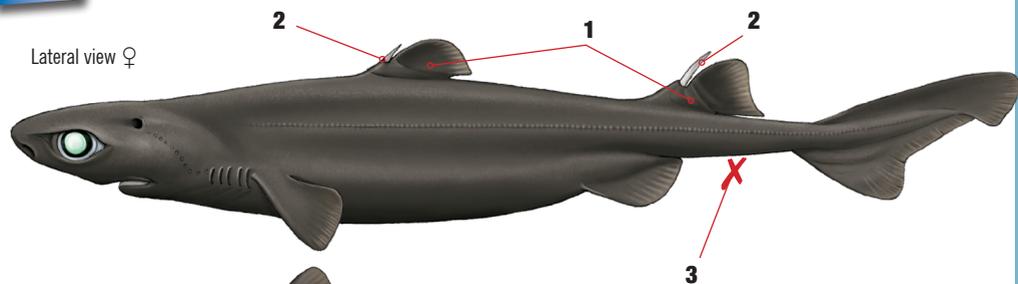
Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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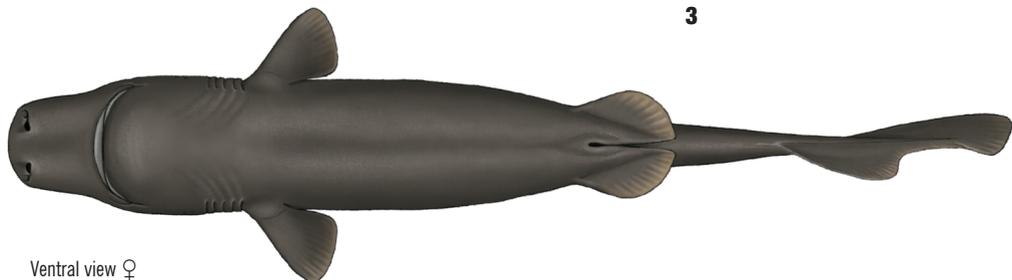
For more ID materials visit [www.sharktrust.org/ID](http://www.sharktrust.org/ID).

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Lateral view ♀



Ventral view ♀

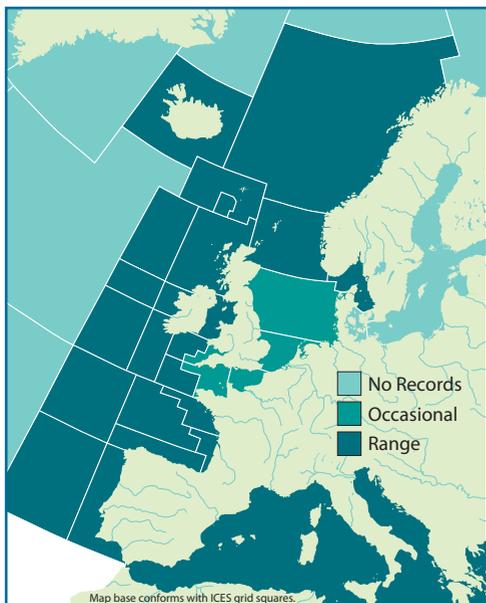


## SCIENTIFIC NAME

*Etmopterus princeps* (Collett, 1904).

## DISTRIBUTION

Widespread in the North Atlantic. East Atlantic from Iceland to Gibraltar, possibly to Mauritania. Reported from the Pacific.



## COMMON NAME

**GREAT LANTERNSHARK**, Sagre Rude (Fr), Tollo Lucero Raspa (Es).

## IDENTIFICATION

- 1 Second dorsal fin larger than first.
- 2 Large dorsal spines.
- 3 No anal fin<sup>i</sup>.
- 4 Large lateral denticles with thick cusps<sup>v</sup>.

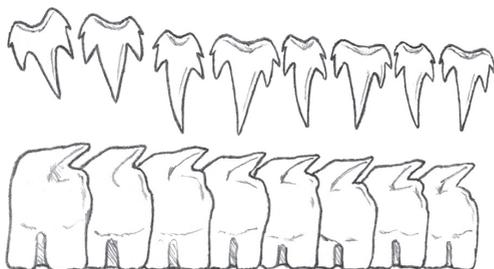
## COLOUR

- Uniform blackish colouring.
- No patterns or markings<sup>i</sup>.

## BIOLOGY AND SIZE

- Mature: 62cm ♀, 55cm ♂.  
Max TL: 96cm ♀, 71cm ♂<sup>iii</sup>.
- Ovoviviparous. Litters of 6-16 recorded but usually 12<sup>iii</sup>.
- Diet made up equally of fish and cephalopods with a small amount of crustaceans<sup>ii</sup>.

## TEETH



- Upper teeth with 5 cusps and cusplets.
- Lower teeth with oblique cusps<sup>i</sup>.

## SIMILAR SPECIES



- *Etmopterus princeps*, **Great Lanternshark**



- *Etmopterus pusillus*, **Smooth Lanternshark**



- *Etmopterus spinax*, **Velvet Belly Lanternshark**



- *Centroscyllium fabricii*, **Black Dogfish**

## HABITAT

- Continental shelf from 350–2,213m.
- Lower continental rise from 3,750–4,500m in the northeast Atlantic<sup>vii</sup>.
- Segregate by sex<sup>iv</sup>. Possibly also segregate by size with smaller individuals found deeper<sup>viii</sup>.

## CONSERVATION STATUS

- Subject to bycatch mortality across its range and may be under considerable fishing pressure<sup>ii</sup>. Species specific data lacking but it appears to be abundant on the Mid-Atlantic Ridge<sup>iv</sup>.
- **Red List status:** Data Deficient (2005).

## COMMERCIAL IMPORTANCE

- Taken as bycatch in bottom trawls across its range.
- May be utilised in the Northeast Atlantic but details are unknown<sup>vi</sup>.
- 2010 – Subject to a zero TAC in EU waters.

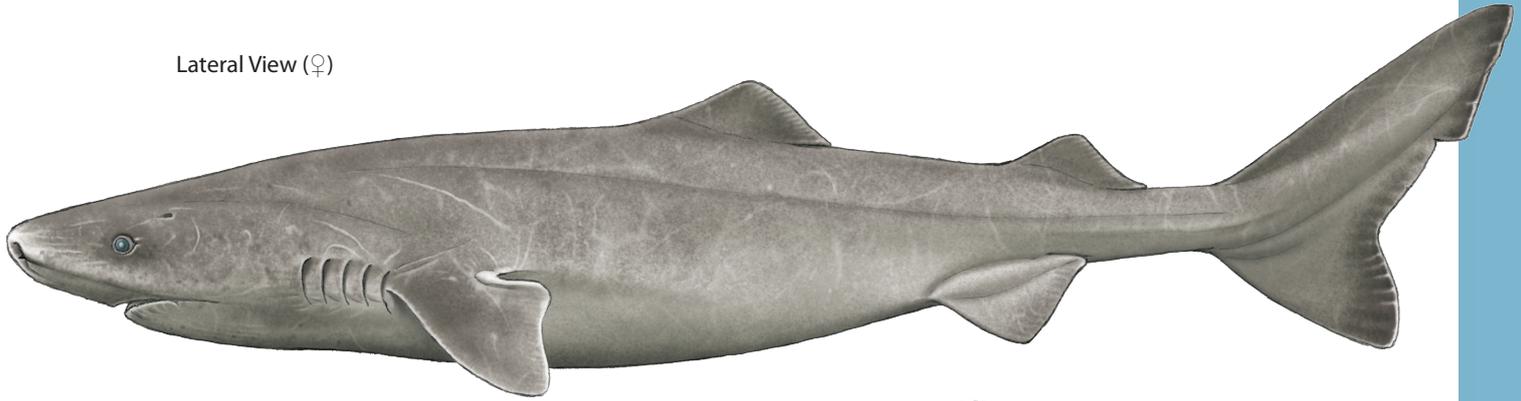
## HANDLING

- Handle with care.
- Large dorsal spines.
- Abrasive skin.

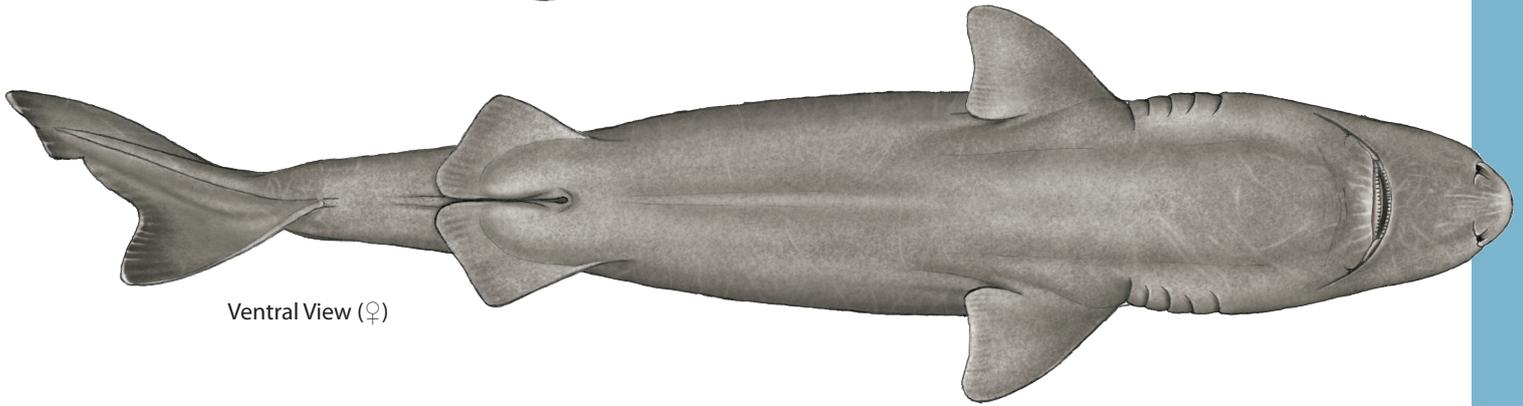
## REFERENCES

- i. Compagno, L. J. V.; 1984. FAO
- ii. Cortés, E; 1999. *ICES JMS*.
- iii. Cotton, C; 2009. Pers. Comm.
- iv. Dyb, J. E. *et al*; 2004. Møreforskning.
- v. Frietas, M. *et al*; 2007. Museu Municipal do Funchal.
- vi. Herndon, A. P; 2006. IUCN Red List.

Lateral View (♀)



Ventral View (♀)



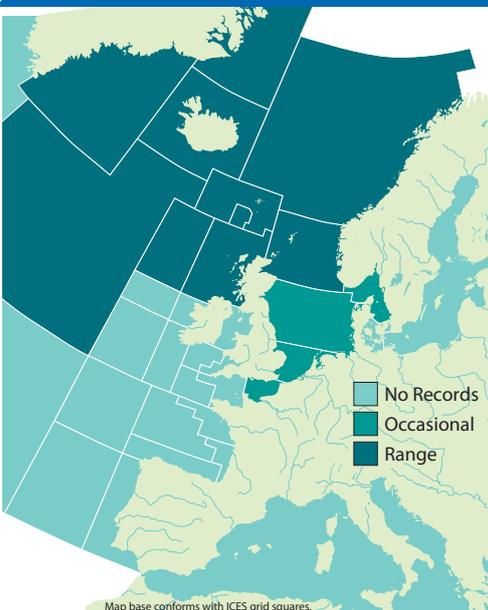
### COMMON NAMES

**Greenland Shark**, Sleeper Shark, Large Sleeper Shark, Ground Shark, Gray Shark, Gurry Shark, Laimargue du Groenland (Fr), Tollo de Groenlandia (Es).

### SYNONYMS

*Squalus microcephalus* (Bloch and Schneider, 1801), *Squalus carcharias* (Gunnerus, 1766), *Squalus squatina* (Pallas, 1814), *Squalus norwegianus* (Blainville, 1816), *Squalus/Somniosus brevipinna* (LeSueur, 1818), *Squalus borealis* (Scoresby, 1820), *Scymnus gunneri* (Thienemann, 1828), *Scymnus glacialis* (Faber, 1829), *Scymnus micropterus* (Valenciennes, 1832), *Leiodon echinatum* (Wood, 1846), *Somniosus antarcticus* (Whitley, 1939).

### DISTRIBUTION



The Greenland Shark is known in the east Atlantic from the Seine River mouth, France to Spitsbergen Island, Russia. It is also known from similar latitudes in the west Atlantic. Reports from the South Atlantic and Antarctic are thought to be misidentifications of the Southern Sleeper Shark, *Somniosus antarcticus* (Kyne et al., 2006).

### APPEARANCE

- Short rounded snout and a heavy cylindrical body.
- Very small eyes.
- First dorsal fin set behind pectoral fins.
- Second dorsal fin set slightly behind pelvic fins.
- All pre-caudal fins small.
- No anal fin.
- Heterocercal caudal fin with long ventral lobe.
- Medium grey to brown.
- Sometimes pattern of transverse dark bands.
- Also sometimes small dark spots/blotches and small light spots.
- To more than 640cm in length, possibly up to 730cm.

The Greenland Shark is a massive species with a heavy cylindrical body and short rounded snout. Its precaudal fins are all small. The dorsal fins are spineless and equally sized, the first of which is closer to the pelvic fins than pectoral fins. There is no anal fin and no keels are present on the caudal fin (Compagno, 1984).

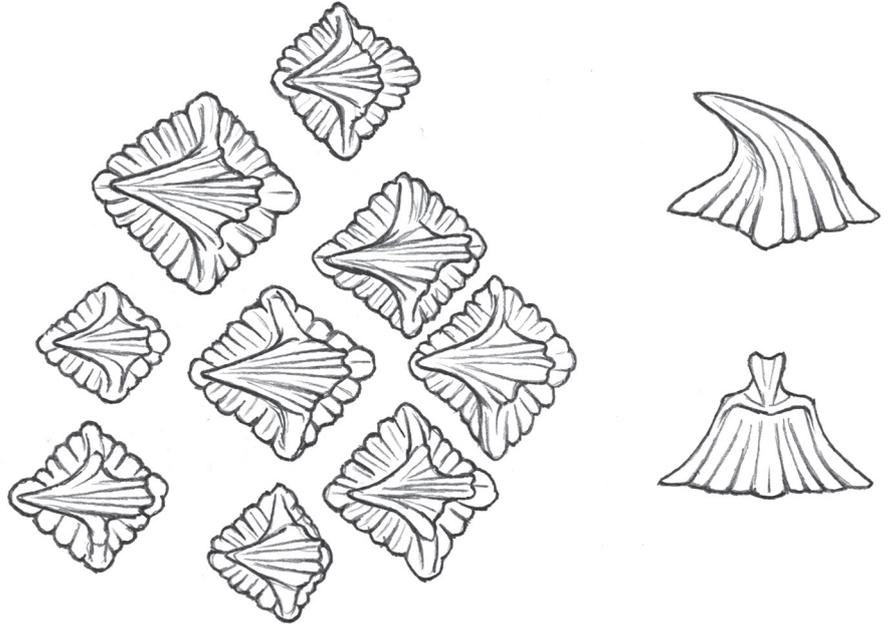
It varies between a uniform black, brown and grey colour, although it may be marked with dark lines or white spots along its back and sides (Eagle, Unknown). It reaches a maximum total length of at least 640cm, possibly to 730cm (Compagno et al., 2005).

## SIMILAR SPECIES

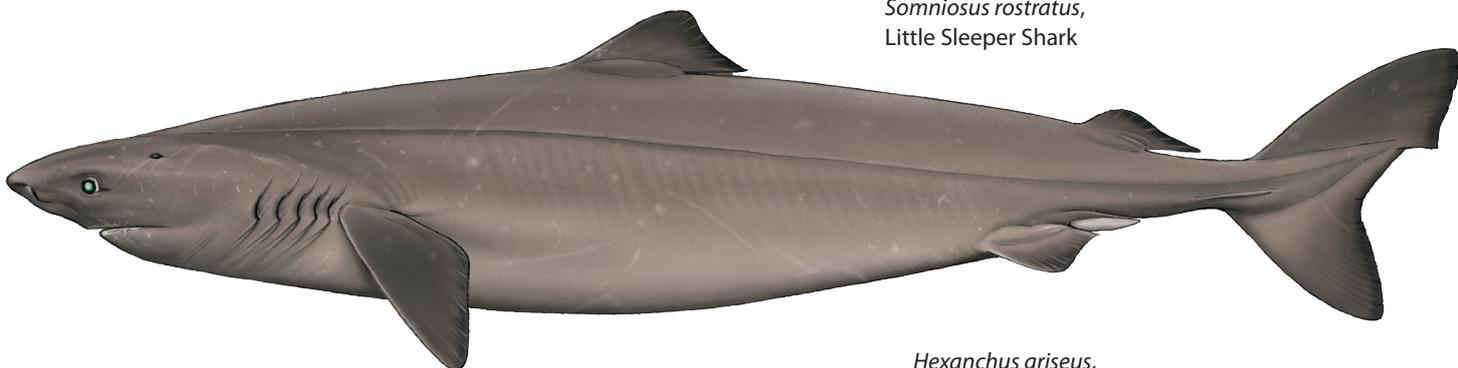
*Somniosus rostratus*, Little Sleeper Shark

*Hexanchus griseus*, Bluntnose Sixgill Shark

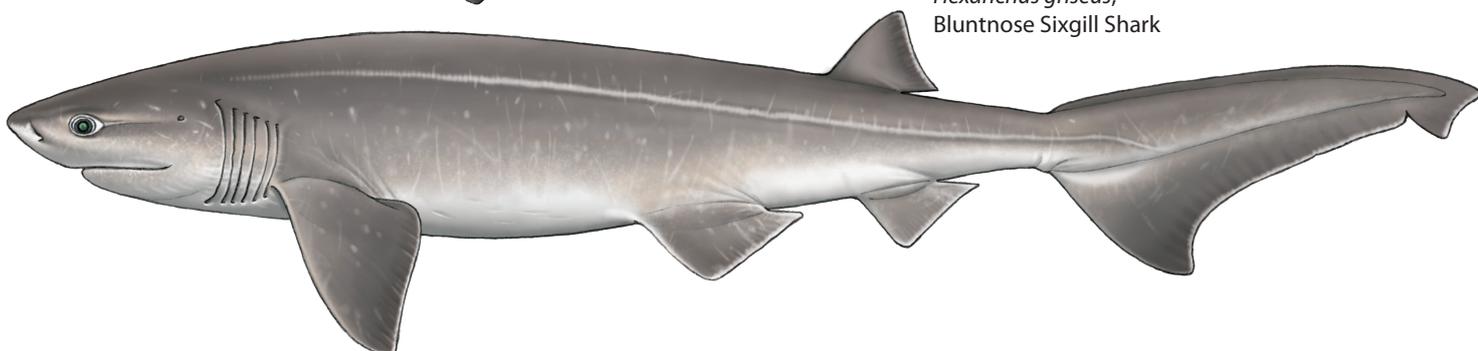
Dermal Denticles of *Somniosus microcephalus*



*Somniosus microcephalus*,  
Greenland Shark



*Somniosus rostratus*,  
Little Sleeper Shark

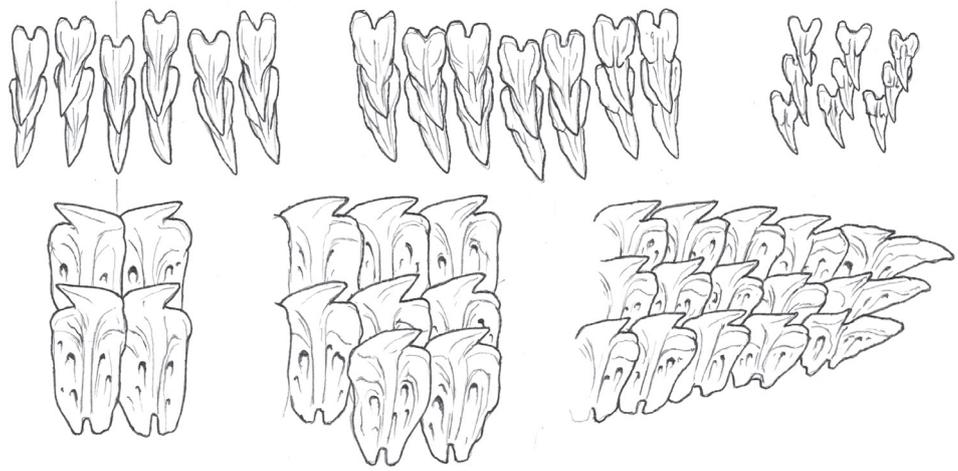


*Hexanchus griseus*,  
Bluntnose Sixgill Shark

(Not to scale)

### TEETH

The upper teeth are very thin, pointed and lack serrations, ranging in number from 48–52. The lower teeth are interlocking, broad and square with short, smooth cusps which point outward. These range in number from 50–52 (Eagle, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Greenland Shark is found from surface waters in shallow estuaries and bays to depths of at least 1,200m in continental shelf and slope waters. In 1988, a 6m long male was observed at 2,200m on the wreck of the SS Central America off the coast of Savannah, Georgia (Eagle, Unknown). It has been reported from higher latitudes that the species moves into shallower waters during the colder months, retreating to deeper water when the oceans warm in the summer. At lower latitudes the species is believed to remain on the continental shelves during the colder months, moving into shallower water during the spring and summer (Kyne *et al.*, 2006).

Tracking studies from Baffin Island, Canada have shown that daily movements from deeper waters during the morning to shallower waters in the afternoon and at night also occur. These movements are possibly related to preying on seals. It has been recorded in water from 0.6–12°C (Kyne *et al.*, 2006).

#### DIET

Fish are an important food item for the Greenland Shark and known species that are preyed upon include herring, spiny eels, salmon, char, smelt, cod, ling, pollock, haddock, Atlantic and Greenland Halibut, wolf-fish, redfish, sculpins, lumpfish, and skates and their egg-cases. Marine mammals are also important with seals and small cetaceans found in the stomachs of specimens, the latter probably taken as carrion. Other common prey includes sea birds, squids, crabs, amphipods, marine snails, brittle stars, sea urchins, and jellyfish. The Greenland Shark is an indiscriminate scavenger and feeds on offal and carrion whenever available. Parts of drowned horses and in one case a whole reindeer have been found in larger specimens (Compagno, 1984).

#### REPRODUCTION

Very little is known of the Greenland Sharks reproduction biology. Until very recently it was believed to be an oviparous species as no gravid females had been observed. It is now known to be ovoviviparous with litters of approximately 10. The pups are born measuring ~37–38cm in length. The size and age at maturity, the gestation period and the reproductive periodicity are all unknown (Kyne *et al.*, 2006).

#### PARASITISM

The majority of Greenland Sharks are parasitised by the copepod *Ommatokoita elongata*, up to 98.9% of individuals in surveyed populations. It was recorded that 100% of sharks had associated *O. elongata* parasites in a recent tagging study off Baffin Island, Canada. However in some areas this parasitism is less prevalent. Studies of Greenland Shark behaviour in the mouth of the St. Lawrence River have found no individuals with copepod parasites on either eye. This study also revealed that sharks with no parasites reacted in a way to closely approaching divers that had not been observed in parasitised animals. Details of these displays have been described by Harvey-Clark, Gallant and Batt (2005).

When an *O. elongata* female in the nauplius stage encounters a Greenland Shark it infects the cornea of an eye. As this copepod matures, it embeds an anchoring device into the cornea and permanently tethers itself to it, causing corneal lesions which can seriously disrupt the sharks' vision. It has often been speculated that these parasites are bioluminescent and attract potential prey to the shark, making it a mutualistic rather than parasitic relationship. This could explain how such an apparently sluggish shark is able to regularly feed on much faster prey such as marine mammals and fish. However, such bioluminescence has never been observed and this theory is controversial. It may simply be that the Greenland Shark relies on senses other than sight to hunt, allowing it to ambush faster prey in the poor visibility of the deep Arctic Ocean (Benz and Dippenaar, 1998).

## COMMERCIAL IMPORTANCE

The Greenland Shark was historically targeted for its liver oil in Norway, Iceland and Greenland. In the 1910's, catches of the Greenland Shark reached 32,000 animals a year in Greenland alone. It is still taken as bycatch in trawl, gillnet and trap fisheries throughout its range as well as being an important target species for artisanal fisheries in the Arctic where it is fished through ice (Kyne *et al.*, 2006). These traditional fisheries utilise the skin for making boots and the lower teeth as knives for cutting hair, as well as eating the flesh after extensive preparation to remove poisons (Eagle, Unknown).

## THREATS, CONSERVATION, LEGISLATION

The Greenland Shark is an extremely long lived and slow growing species, tagging studies have shown that medium sized sharks grow at around 1cm a year. While its population dynamics and biology are poorly understood, such a large and slow growing shark is likely to be extremely vulnerable to fishing pressure. While massive fisheries for the species have existed previously, it is now only occasionally taken as bycatch. Artisanal fisheries for this species still exist in the north of its range where it can be relatively easily fished through ice holes due to its sluggish nature. Catches of the Greenland Shark must be carefully monitored if potentially significant declines in populations as are to be avoided (Kyne *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Near Threatened (2005).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Massive, powerful shark.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

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Text: Richard Hurst.  
Illustrations: Marc Dando.

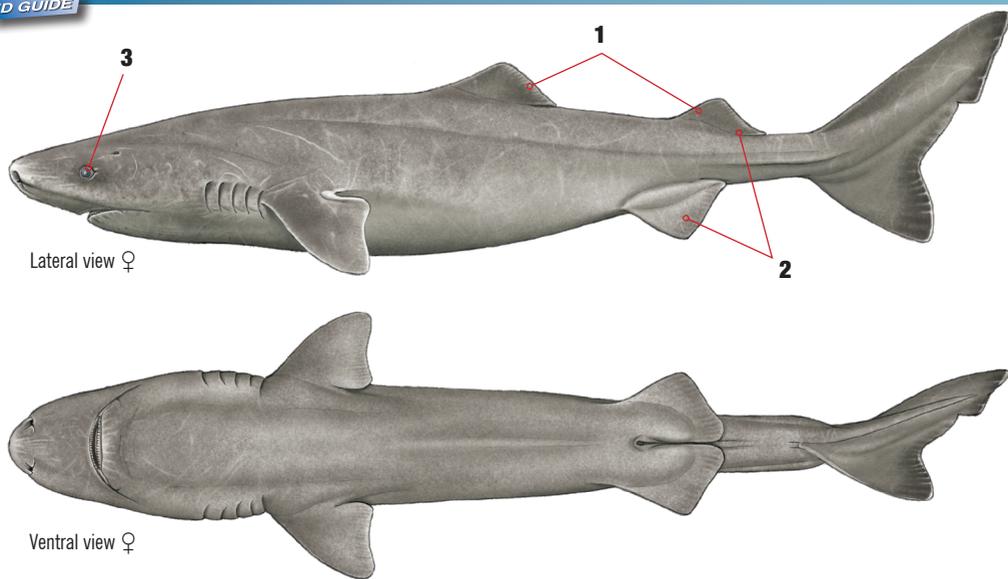
### Citation

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Lateral view ♀

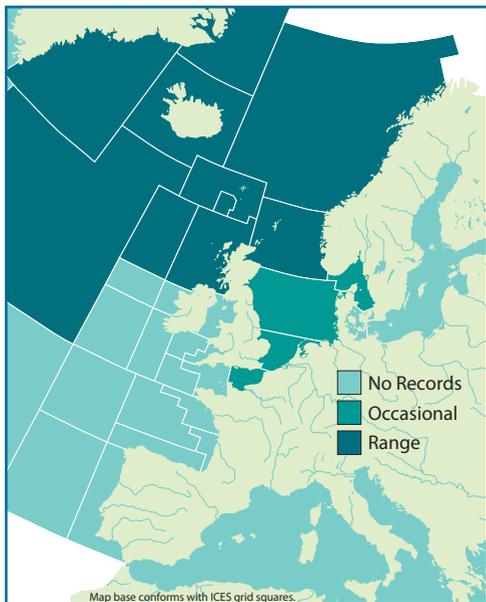
Ventral view ♀

## SCIENTIFIC NAME

*Somniosus microcephalus* (Bloch & Schneider, 1801).

## DISTRIBUTION

Found across the North Atlantic. East Atlantic from Russia to France<sup>v</sup>. Single record from the Azores.



## COMMON NAME

**GREENLAND SHARK**, Sleeper Shark, Large Sleeper Shark, Ground Shark, Gray Shark, Gurry Shark, Laimargue du Groenland (Fr), Tollo de Groenlandia (Es).

## IDENTIFICATION

- 1 Heavily cylindrical body with two, spineless dorsal fins.
- 2 All precaudal fins small, no anal fin.
- 3 Tiny eyes, commonly with visible parasite attached<sup>l</sup>.

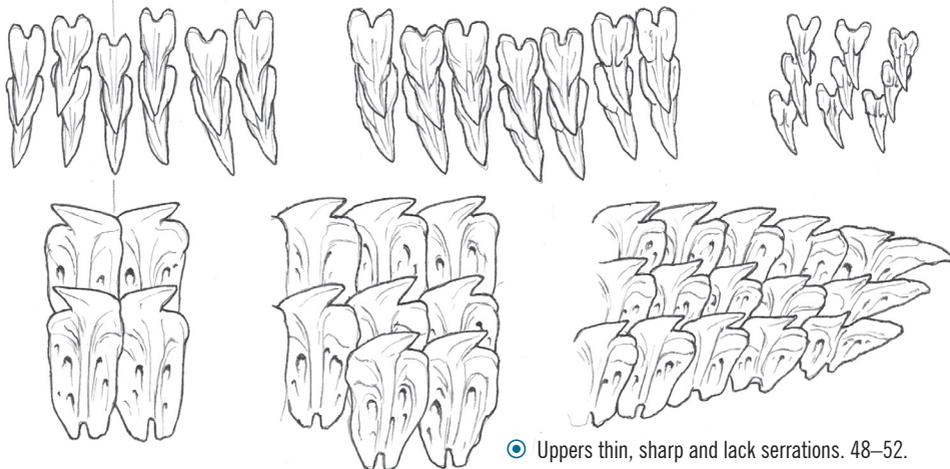
## COLOUR

- Medium grey to brown.
- Rough pattern of small dark spots/blotches and small light spots.
- Sometimes transverse dark bands<sup>iii</sup>.

## BIOLOGY AND SIZE

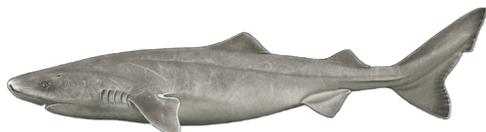
- Born: 37–38cm<sup>iv</sup>. Max TL: 640cm, possibly to 730cm<sup>i</sup>.
- Until recently believed to be oviparous, now known to be ovoviviparous. Average litter size appears to be 10<sup>v</sup>.
- Feeds predominantly on teleost fish with some cephalopods and crustaceans. Land animals and sea birds are commonly reported from stomach contents indicating scavenging<sup>l</sup>.

## TEETH



- Uppers thin, sharp and lack serrations. 48–52.
- Lovers interlocking, broad and square with short, smooth cusps. 50–52<sup>iii</sup>.

## SIMILAR SPECIES



○ *Somniosus microcephalus*, **Greenland Shark**



○ *Somniosus rostratus*, **Little Sleeper Shark**



○ *Hexanchus griseus*, **Bluntnose Sixgill Shark**

## HABITAT

- From shallows to 1,200m, one record to 2,200m<sup>iii</sup>.
- Have been recorded from 0.6–12°C<sup>iv</sup>.
- At high latitudes, they migrate inshore during the colder months. This behaviour is reversed at lower latitudes<sup>v</sup>.

## CONSERVATION STATUS

- Probably a long lived and slow growing species, its biology and population structure are poorly understood. Likely to be extremely vulnerable to fishing pressure<sup>v</sup>.
- **Red List status:** Near Threatened (2005).

## COMMERCIAL IMPORTANCE

- Historically targeted for its liver oil by large-scale industrial fisheries in Norway, Iceland and Greenland.
- Still taken as bycatch in trawl, gillnet and trap fisheries, usually discarded<sup>iv</sup>.
- Targeted by artisanal fishers in the Arctic who utilise the flesh and hide, as well as the lower teeth for knives<sup>iii</sup>.
- 2010 – Subject to a zero TAC in EU waters.

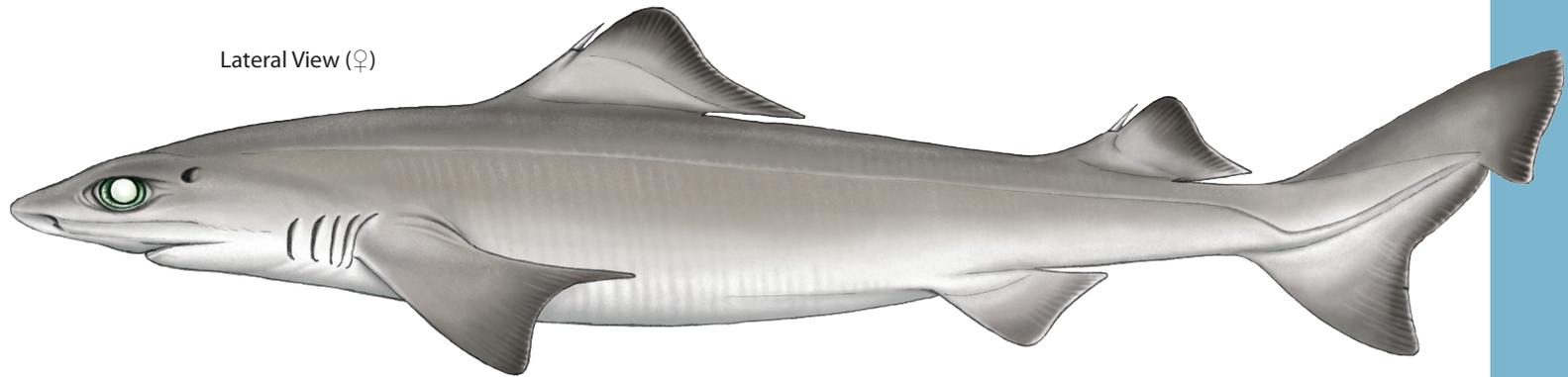
## HANDLING

- Handle with care.
- Massive, powerful shark.
- Sharp teeth.
- Abrasive skin.

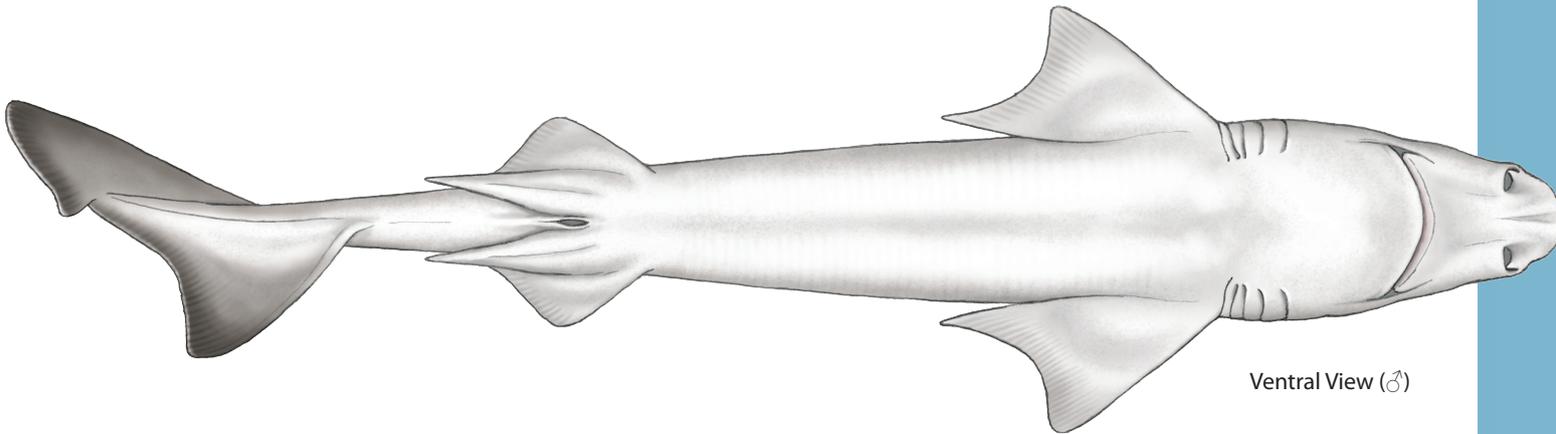
## REFERENCES

- i. Compagno, L. J. V.; 1984. FAO.
- ii. Compagno, L. J. V. *et al*; 2005. HarperCollins Publishers.
- iii. Eagle, D; Unknown. FLMNH.
- iv. Kyne, P. M. *et al*; 2006. IUCN Red List.

Lateral View (♀)



Ventral View (♂)



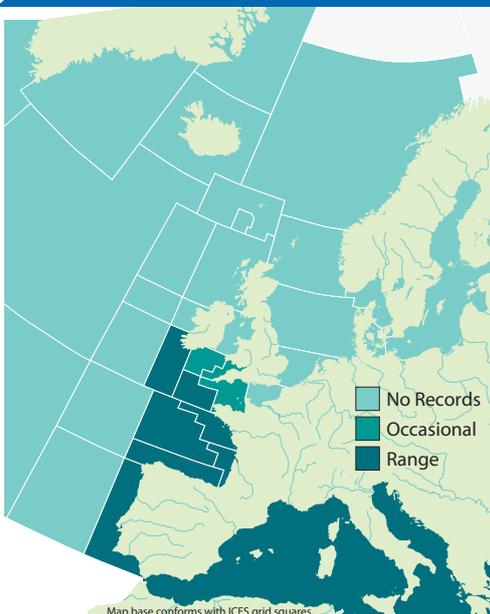
## COMMON NAMES

**Gulper Shark**, Rough Shark, Squale-Chagrin Commun (Fr), Quelvacho (Es).

## SYNONYMS

*Squalus granulosus* (Bloch and Schneider, 1801), *Acantllorhinus granulosus* (Blainville, 1816), *Spinax ugatus* (Bonaparte, 1834), *Centrophorus bragancae* (Regan, 1906), *Centrophorus atromarginatus* (Garman, 1913), *Centrophorus machenquensis* (Maul, 1955).

## DISTRIBUTION



The Gulper Shark can be found from southwest England to South Africa, including the Mediterranean Sea. It is also found in the western Atlantic, the Indian Ocean and the western Pacific (Jennings, Unknown).

## APPEARANCE

- Long, slender dogfish.
- Up to 150cm total length.
- Two dorsal fins bearing long grooved spines.
- Second dorsal fin smaller than first.
- No anal fin.
- Long snout with short anterior nasal flap.
- Dermal denticles non-overlapping, widely spaced and block like.

The Gulper Shark is a slender dogfish with a long snout and large, green eyes. Both dorsal fins have long grooved spines. The second dorsal fin is smaller than the first with a base around  $\frac{3}{4}$  of the length. There is no anal fin. The upper lobe of the caudal fin is long and well developed, the lower lobe is shorter and sturdy (Jennings, Unknown).

The dermal denticles are widely spaced and block-like with crowns sessile on bases without pedicels. These crowns are broad and transversely rhomboidal in adults. It is the subtle differences between dermal denticles which allows positive identification between species in the family Centrophoridae (Jennings, Unknown).

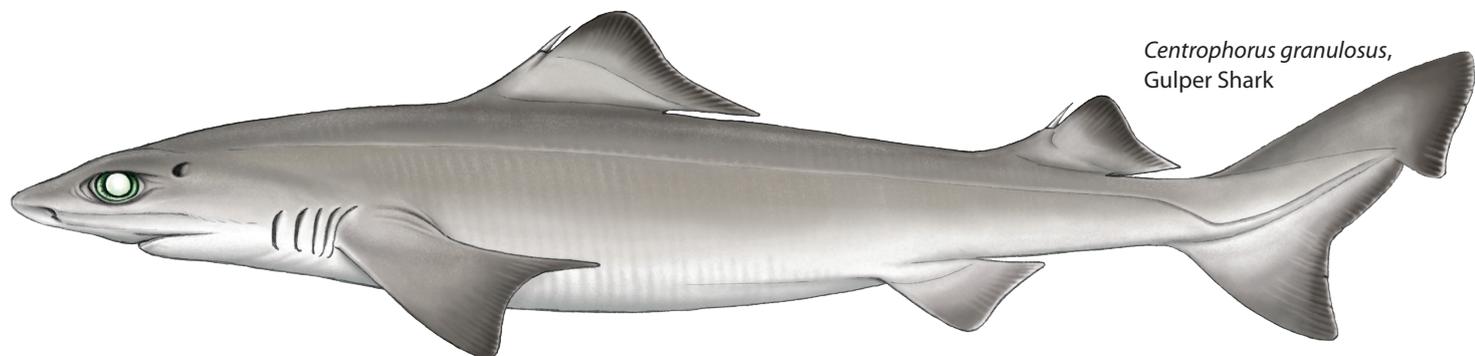
The dorsal surface colouration varies from olive-grey, sandy-grey, grey-brown to brown. The ventral surface is similar but lighter. There are no obvious patterns or markings on adults, juveniles may be lighter and have dusky white tips on the dorsal and caudal fins (Jennings, Unknown).

## SIMILAR SPECIES

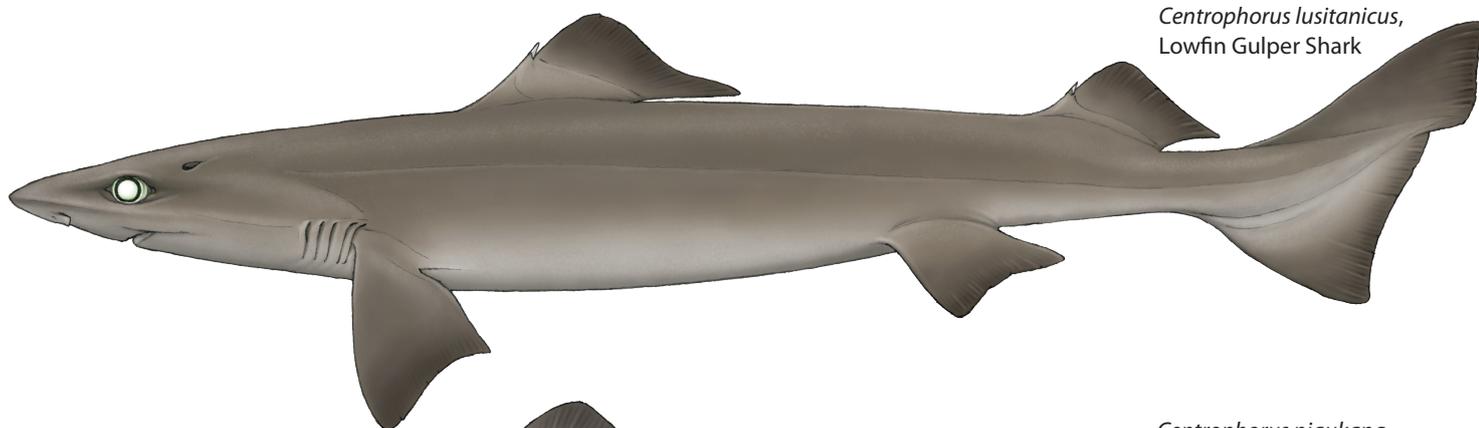
*Centrophorus lusitanicus*, Lowfin Gulper Shark

*Centrophorus niaukang*, Taiwan Gulper Shark

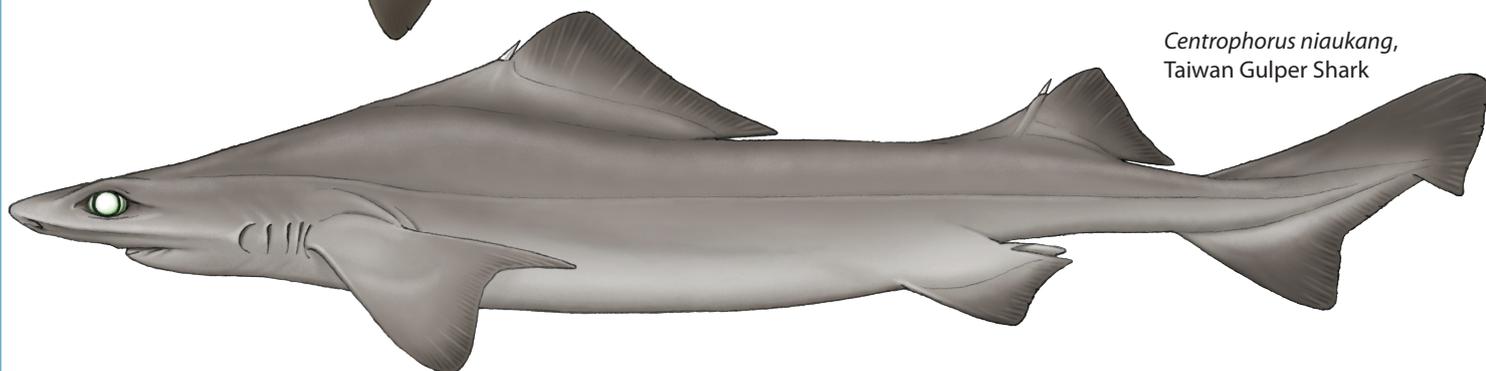
*Centrophorus squamosus*, Leafscale Gulper Shark



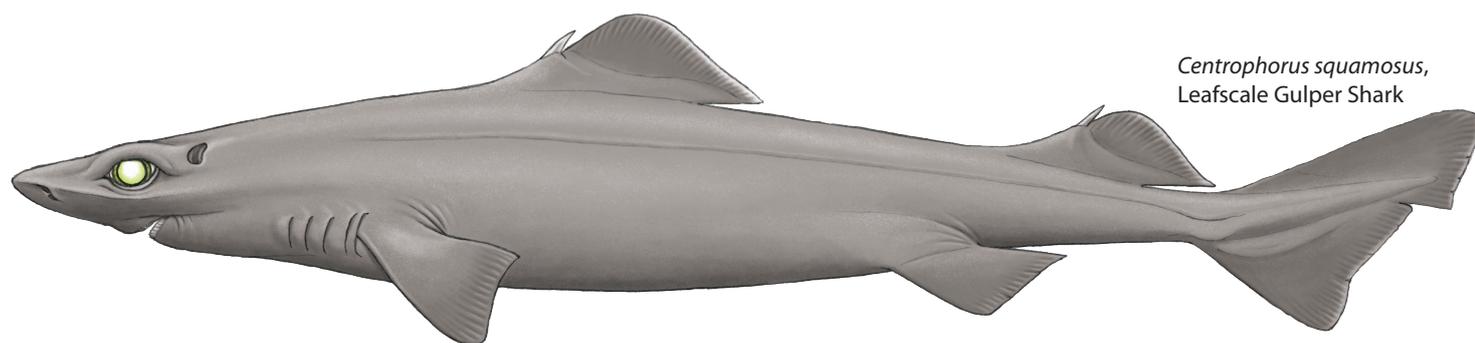
*Centrophorus granulosus*,  
Gulper Shark



*Centrophorus lusitanicus*,  
Lowfin Gulper Shark



*Centrophorus niaukang*,  
Taiwan Gulper Shark

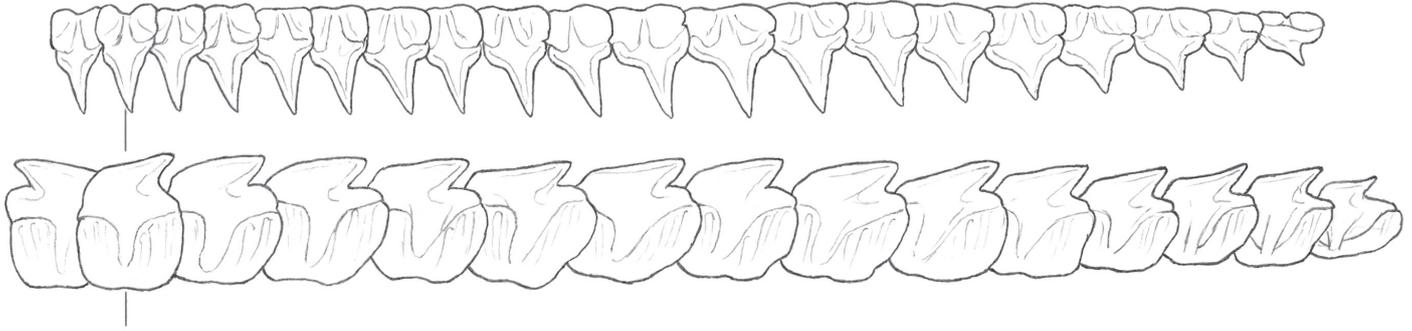


*Centrophorus squamosus*,  
Leafscale Gulper Shark

(Not to scale)

### TEETH

The teeth are blade-like and unicuspidate, the uppers larger than the lower. The upper teeth are symmetrical to nearly symmetrical along the centre of the jaw. The lower teeth have finely serrated or smooth cutting edges (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Gulper Shark is a deep water species found from 100–1,490m, most common between 300–800m. Bathydemersal, it is normally found either on or near the substrate. It is thought to form schools due to its abundance in certain hauls and not others. It is also known to appear at baited cameras several at a time and not individually as would be expected from solitary animals. These schools are believed to be segregated by size and sex, with the majority of individuals in the lower half of the depth range juveniles (Gullart *et al.*, 2006). In the intermediate depths (550–800m) males seem to dominate whilst in the upper part of its range, females dominate (200–400m) (Golani and Pisanty, 2000).

#### EGGCASE

N/A

#### DIET

The diet of the Gulper Shark is poorly understood but it is thought to prey on hake, lanternfish, squid and epigonids, as well as a variety of other benthic and mesopelagic bony fish and invertebrates (Gullart *et al.*, 2006).

#### REPRODUCTION

Little is known of the reproduction of the Gulper Shark except that it is ovoviviparous with a gestation period of approximately 2 years. At birth the single pup measures 30–42cm in length (Jennings, Unknown). Immature males of 45–58cm are known and fully mature males of 80–94cm are also known, suggesting a total length at maturity of 60–80cm for males. Immature females up to 96cm in total length have been found (Carpenter, 2009).

## COMMERCIAL IMPORTANCE

The Gulper Shark is taken as bycatch throughout its range by bottom trawls, pelagic trawls and hook and line. Some deepwater longline fisheries do target the Gulper Shark. It can be smoked, dried or salted for human consumption and can be processed for fishmeal and liver oil (Jennings, Unknown).

## THREATS, CONSERVATION, LEGISLATION

The Gulper Shark is believed to have the lowest reproductive potential of all elasmobranchs. Females do not reach maturity until 12–16 years of age, there is only a single pup to a litter and the gestation period is around 2 years with occasional resting periods. This makes it extremely vulnerable to fishing pressure. The IUCN has listed the species as critically endangered in the northeast Atlantic meaning a population decline of 80–95% from virgin biomass has been observed due to overfishing with bottom trawls, long lines, fixed bottom nets, hook and line and pelagic trawls (Gullart *et al.*, 2006).

In ICES sub-areas V, VI, VII, VIII and IX a Total Allowable Catch (TAC) of 1,646 tons (2008) applies to the deepwater sharks *Centroscymnus coelolepis*, *Centrophorus granulosus*, *C. squamosus*, *Deania calcea*, *Dalatias licha*, *Etmopterus princeps*, *E. spinax*, *Centroscyllium fabricii*, *Galeus melastomus*, *G. murinus* and all *Apristurus* spp. Additionally, these species have a TAC of 20 tons in sub-area X and a TAC of 49 tons (including *Deania histricosa* and *D. profundorum*) in sub-area XII (CPOA Shark, 2009).

The only current conservation action in the Mediterranean is a restriction on bottom trawling below 1,000m. However, the Gulper Shark is most commonly found within this depth (to 800m) so this legislation is likely to at best preserve only a small percentage of the virgin biomass (Gullart *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Vulnerable (2006).

Critically Endangered in northeast Atlantic.

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large, venomous dorsal spines.
- Abrasive skin and sharp teeth.

## REFERENCES

- CARPENTER, K. E. 2009. *Centrophorus granulosus*, Gulper Shark. Fishbase. [www.fishbase.org](http://www.fishbase.org).
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Text: Richard Hurst.  
Illustrations: Marc Dando.

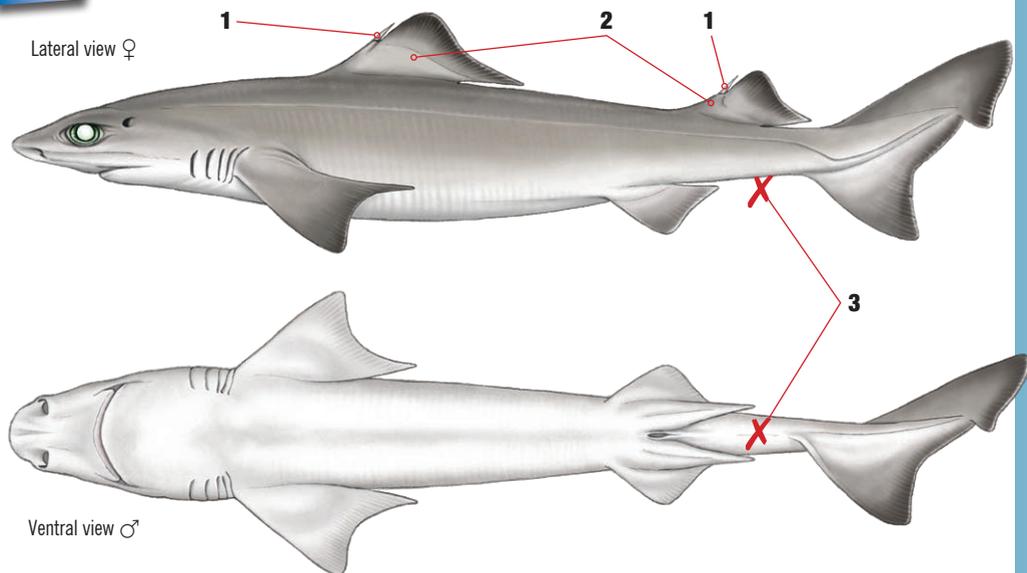
### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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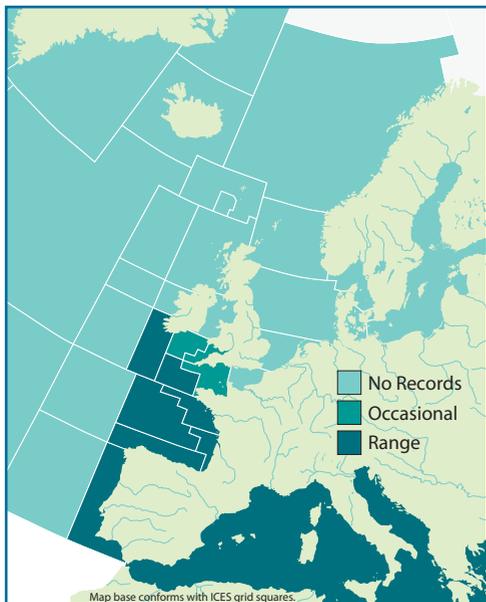


## SCIENTIFIC NAME

*Centrophorus granulosus* (Bloch & Schneider, 1801)

## DISTRIBUTION

Found worldwide but distribution unclear due to species confusion. East Atlantic from southwest England to South Africa, including the Mediterranean Sea<sup>i</sup>.



## COMMON NAME

**GULPER SHARK**, Rough Shark, Squale-Chagrin Commun (Fr), Quelvacho (Es).

## IDENTIFICATION

- 1 Long, grooved dorsal spines.
- 2 First dorsal fin larger than second.
- 3 No anal fin<sup>i</sup>.

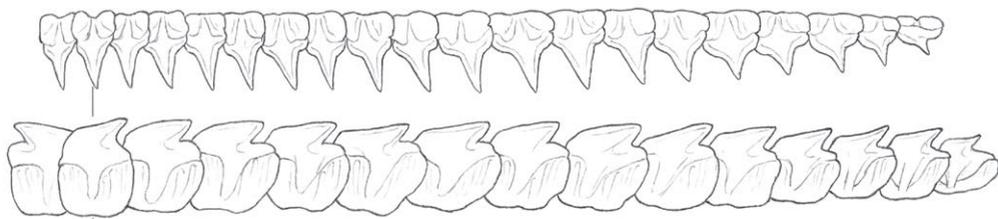
## COLOUR

- Olive grey to light brown dorsally.
- Similar but lighter ventrally.
- Juveniles may be lighter with black tips on dorsal and caudal fins<sup>ii</sup>.

## BIOLOGY AND SIZE

- Born: 30–42cm. Mature: ~95cm ♀, 60–80cm ♂<sup>iv</sup>. Max TL: 105–110cm<sup>ii</sup>.
- Extremely low reproductive potential. Two pups per litter with a possible gestation of 2–3 years<sup>v</sup>.
- Eats mostly bony fish with some squid, crustaceans and chondrichthyan<sup>iii</sup>.

## TEETH



- Uppers are blade-like and unicuspidate.
- Lowers oblique with finely serrated or smooth cutting edges!

## SIMILAR SPECIES



- Centrophorus granulosus*, **Gulper Shark**



- Centrophorus niaukang*, **Taiwan Gulper Shark**



- Centrophorus lusitanicus*, **Lowfin Gulper Shark**



- Centrophorus squamosus*, **Leafscale Gulper Shark**

## HABITAT

- 100–1,490m, most common 300–800m.
- Believed to form schools<sup>v</sup>.
- Segregate by size and sex, although details differ between locations<sup>vi</sup>.

## CONSERVATION STATUS

- Extremely vulnerable to fishing pressure due to life history characteristics. Populations may have decreased 80–95% in northeast Atlantic<sup>v</sup>.
- Red List status:** Vulnerable (2006). Critically Endangered in northeast Atlantic.

## COMMERCIAL IMPORTANCE

- Taken as bycatch throughout its range in bottom trawl, pelagic trawl and line fisheries.
- Targeted for its flesh and liver oil<sup>v</sup>.
- 2010 – Subject to a zero TAC in EU waters.

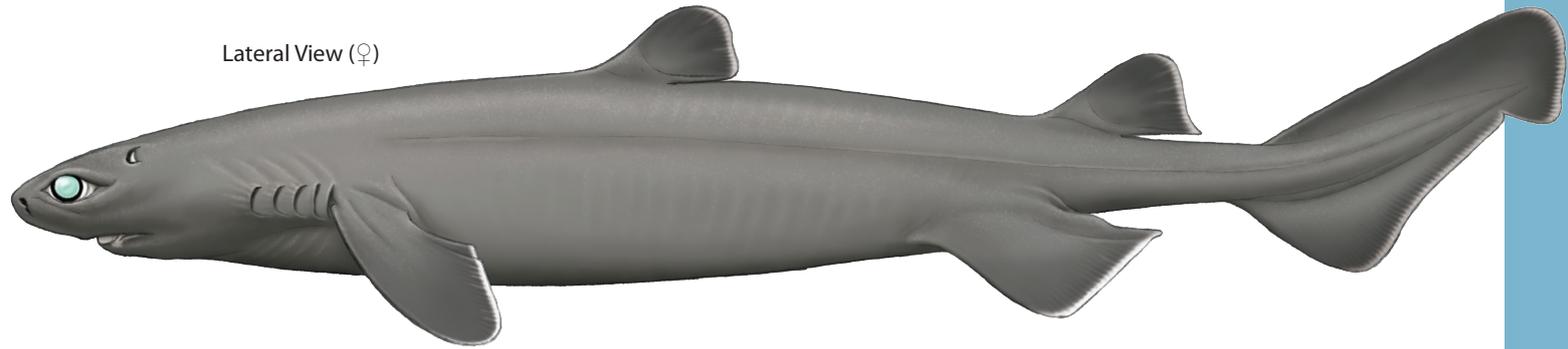
## HANDLING

- Handle with care.
- Large dorsal spines.
- Abrasive skin and sharp teeth.

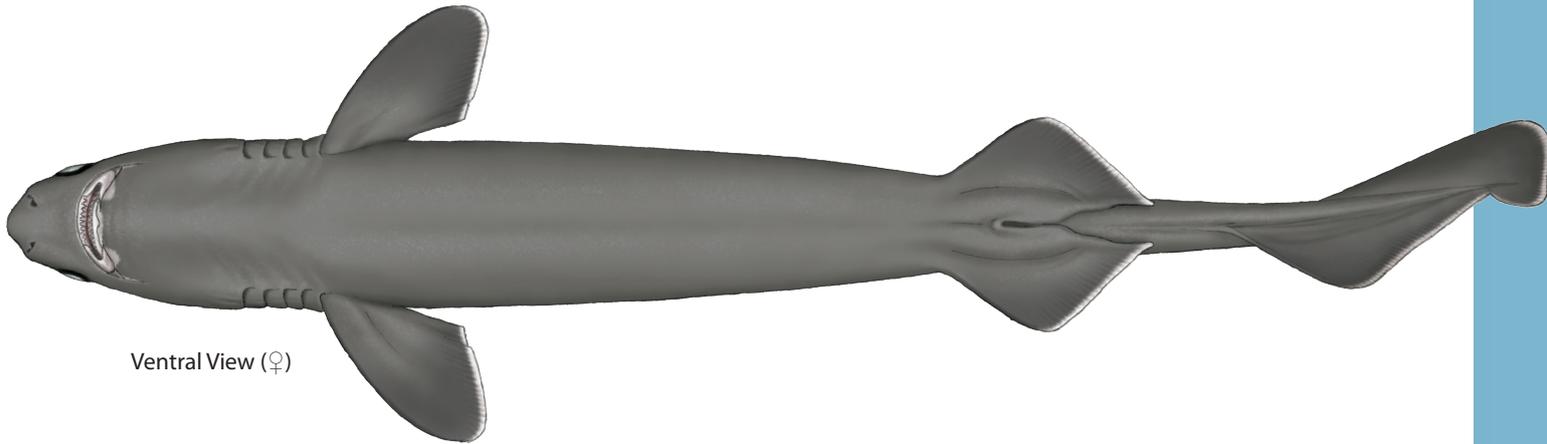
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- Golani, D. *et al*; 2000. *Acta Adriatica*.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Kitefin Shark**, Black Shark, Darkie Charlie, Seal Shark, Squale Liche (Fr), Carcho (Es), Chokoladehaj (Dk), Schokoladenhai (De), Valse Doornhaai (NI).

### SYNONYMS

*Dalatias tachiensis* (Shen & Ting, 1972), *Pseudoscymnus boshuensis* (Herre, 1935), *Scymnorhinus brevipinnis* (Smith, 1936), *Scymnorhinus licha* (Bonnaterre, 1788), *Scymnorhinus phillippsi* (Whitley, 1931), *Scymnus vulgaris* (Cloquet, 1822), *Squalus americanus* (Gmelin, 1789), *Squalus licha* (Bonnaterre, 1788), *Squalus nicaeensis* (Risso, 1810), *Squalus scymnus* (Voigt, 1832), *Dalatias sparophagus* (Rafinesque, 1810), *Scymnus aquitanensis* (de la Pylaie, 1835).

### DISTRIBUTION



A widespread but sporadically distributed species. Encountered in the east Atlantic from Scotland and the southern North Sea to Cameroon, including the western Mediterranean. Also known from the western Atlantic Ocean, the western Indian Ocean and the Pacific Ocean (Compagno, 1984).

### APPEARANCE

- Moderately sized shark with a short, blunt snout.
- No spines associated with dorsal fins.
- No anal fin.
- No obvious lower caudal lobe.
- Teeth in lower jaw distinctively triangular and serrated.
- Colouration from greyish black to reddish brown.
- Often poorly defined black spots on dorsal surface.
- Fin margins white or translucent and tail tipped black.
- 180cm maximum length.

The Kitefin Shark is a moderately sized deep-sea shark with a slender trunk and short, blunt snout. The gill openings are short and the mouth is mildly arched with thick lips. The first dorsal fin originates just behind the pectoral fins and is slightly smaller than the second. There are no associated spines and no anal fin. The tail has a well developed upper half with a large terminal lobe. The lower half of the tail is small, almost non-existent as a definite lobe (Bester and Burgess, Unknown).

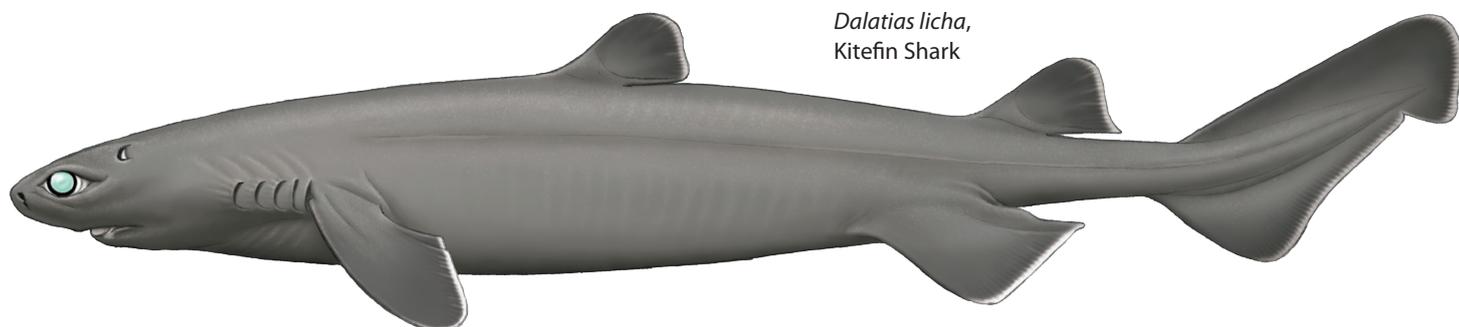
The colouration does not vary significantly, usually deep brown to greyish black. The only patterns on the dorsal surface are poorly defined black spots, white or translucent margins to the fins and a black tip to the tail (Bester and Burgess, Unknown).

## SIMILAR SPECIES

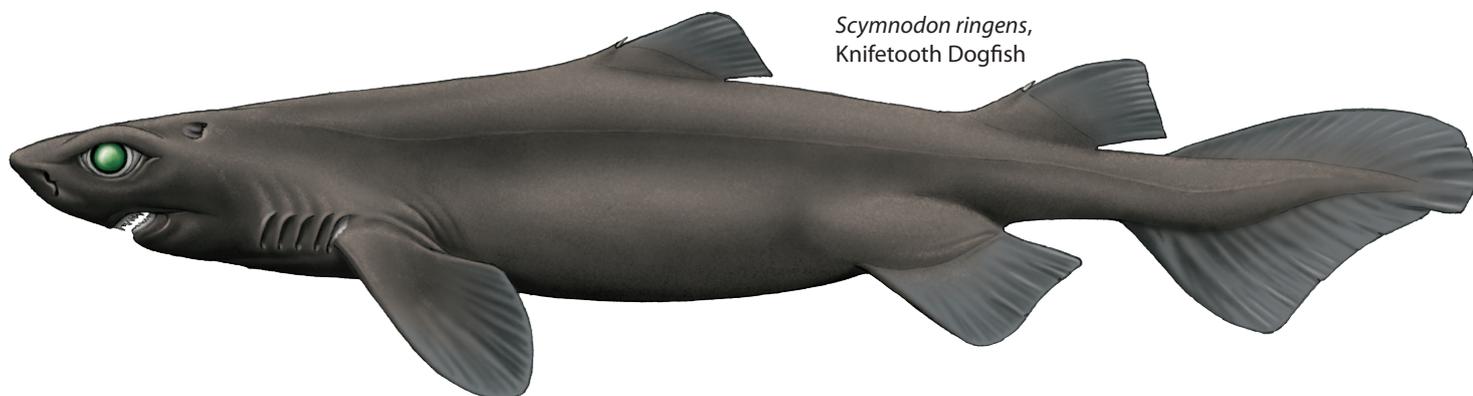
*Scymnodon ringens*, Knifetooth Dogfish

*Centroscymnus coelolepis*, Portuguese Dogfish

*Zameus squamulosus*, Velvet Dogfish



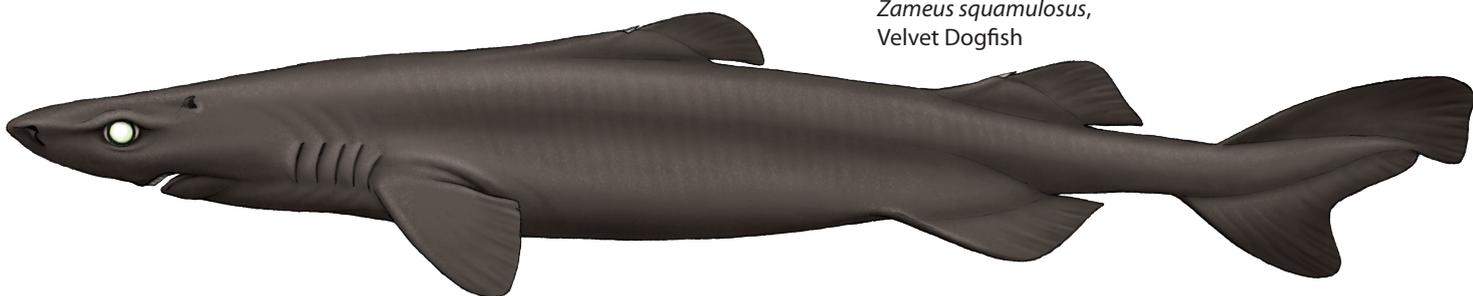
*Dalatias licha*,  
Kitefin Shark



*Scymnodon ringens*,  
Knifetooth Dogfish



*Centroscymnus coelolepis*,  
Portuguese Dogfish

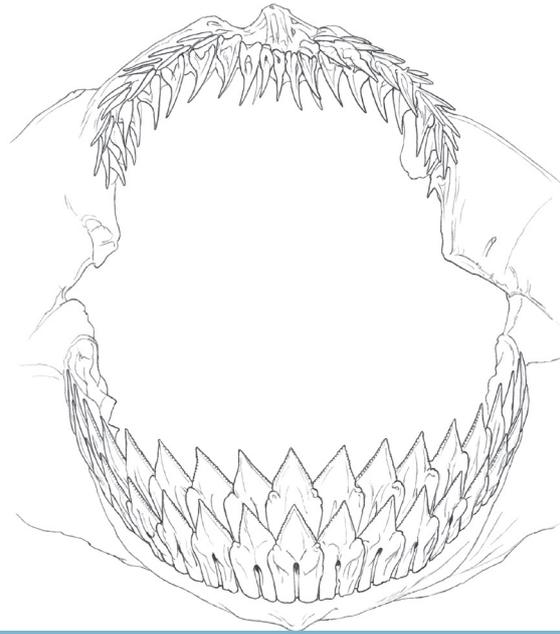
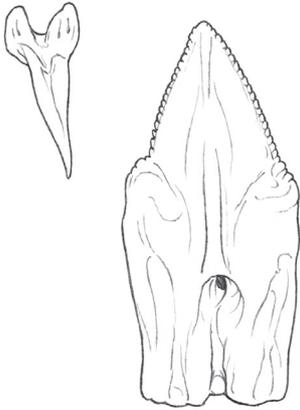


*Zameus squamulosus*,  
Velvet Dogfish

(Not to scale)

### TEETH

The teeth of the Kitefin Shark are a useful identification tool as it is the only known species from the North Atlantic with triangular, serrated lower teeth combined with no anal fin. Its upper teeth are slender and awl shaped, curving outward toward the corners of the mouth (Bester and Burgess, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Kitefin Shark occurs on the outer continental shelf to at least 1,800 metres, although it has been found as shallow as 37m. It is most common below 200m. It is normally encountered either on or near the substrate but readily ranges well off the bottom and is often caught in the water column. It does not appear to form schools or aggregations (Bester and Burgess, Unknown).

#### EGGCASE

N/A

#### DIET

The Kitefin Shark feeds on a huge variety of prey including smelt (Argentinidae), viperfishes, scaly dragonfishes, barracudinas, greeneyes, lanternfishes, gonostomatids, cod, ling, whiting and other gadids, hake, grenadiers, deepwater scorpionfishes, bonito, gempylids, epigonids, and chaunacid anglers, but also skates, catsharks (*Galeus*), spiny dogfish (*Squalus, Etmopterus* and *Centrophorus*), squid, octopi, amphipods, isopods, shrimp and lobsters, polychaetes and siphonophores. The presence of fast, pelagic species such as bonito suggests either scavenging or a means of ambush not yet recorded, such as that employed by the related Cookiecutter Sharks (*Isistius*). Young Kitefin Sharks eat more cephalopods than adults which seem to prefer crustaceans and other sharks (Compagno, 1984).

#### REPRODUCTION

Mature males have been found measuring 77–121cm in length. Mature females have been found measuring 117–159cm in length. An ovoviparous species, the Kitefin Shark gives birth to litters of 10–16 young each measuring about 30cm in length (Bester and Burgess, Unknown). Very little else is known of its life history parameters except that the size of the female is related to the number of pups in a litter, meaning that larger females are more valuable to population recovery (Capacé *et al.*, 2008).

## COMMERCIAL IMPORTANCE

Sought for its squalene-rich liver oil and flesh in Japan, its liver oil in South Africa and to be ground into fishmeal in the east Atlantic. There is currently no commercial interest in the west Atlantic (Bester and Burgess, Unknown).

## THREATS, CONSERVATION, LEGISLATION

Records from the Portuguese and Azores directed fisheries for the Kitefin Shark suggest that it is extremely vulnerable to anthropogenic pressures. Off the Azores, it was targeted for its liver oil from the early 1970's. This was a small scale artisanal fishery using hand lines and catches peaked at a total of 2,239 tons in 1981. In the mid 1980's, a large industrial fleet joined the fishery using bottom gillnets. In 1991, 900 tons were landed. This had fallen by 98% to 18 tons in 1998, the year in which the fishery became uneconomical and ceased (Perrotta, 2004).

This situation is not unique to the Azores with deepwater fisheries expanding in both depth range and fishing effort around the world. Due to the life history characteristics of deep-sea sharks (including the Kitefin Shark) such as late maturity, long gestation periods and few young, populations are unlikely to recover for many years if irresponsibly exploited (Compagno and Cook, 2008).

In ICES sub-areas V, VI, VII, VIII and IX a Total Allowable Catch (TAC) of 1,646 tons (2008) applies to the deepwater sharks *Centroscymnus coelolepis*, *Centrophorus granulosus*, *C. squamosus*, *Deania calcea*, *Dalatias licha*, *Etmopterus princeps*, *E. spinax*, *Centroscyllium fabricii*, *Galeus melastomus*, *G. murinus* and all *Apristurus* spp. Additionally, these species have a TAC of 20 tons in sub-area X and a TAC of 49 tons (including *Deania histricosa* and *D. profundorum*) in sub-area XII (CPOA Shark, 2009).

## IUCN RED LIST ASSESSMENT

Near Threatened (2008).  
Vulnerable in northeast Atlantic.

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

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Text: Richard Hurst.  
Illustrations: Marc Dando.

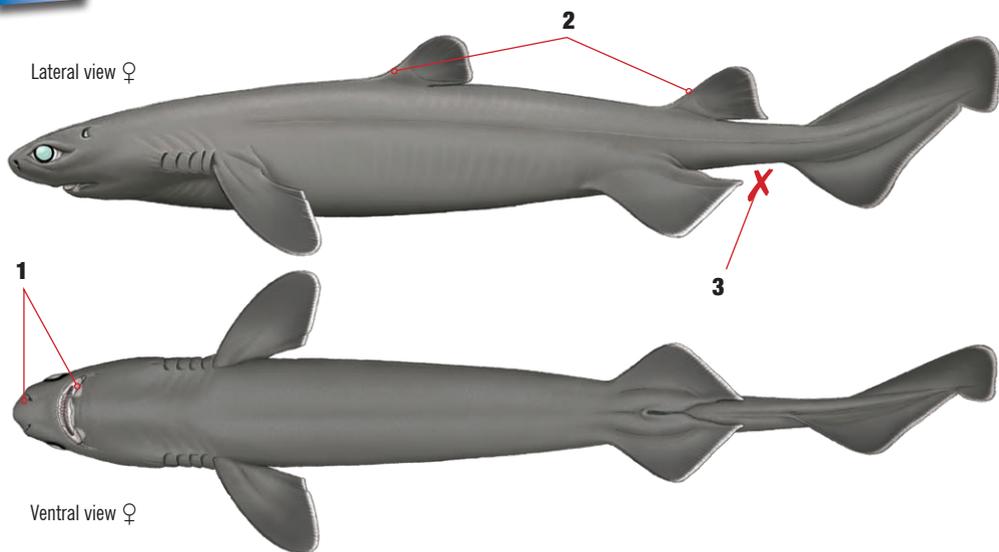
### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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### SCIENTIFIC NAME

*Dalatias licha* (Bonnaterra, 1788).

### DISTRIBUTION

Patchy distribution worldwide. East Atlantic from Scotland to Cameroon, including the western Mediterranean<sup>iii</sup>.



### COMMON NAME

**KITEFIN SHARK**, Black Shark, Darkie Charlie, Seal Shark, Squalo Liche (Fr) Carrocho (Es).

### IDENTIFICATION

- 1 Short, blunt snout with thick lips.
- 2 Dorsal fins almost equal in size with no spines.
- 3 No anal fin<sup>iii</sup>.

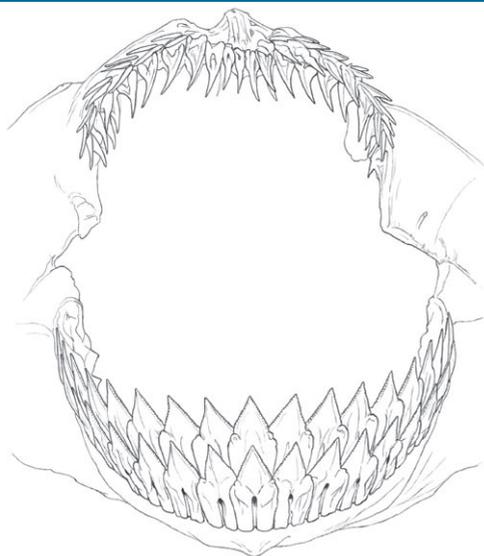
### COLOUR

- Greyish black to red brown.
- Poorly defined black spots on back.
- Fin margins white or translucent. Black tipped caudal fin<sup>i</sup>.

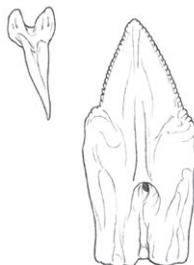
### BIOLOGY AND SIZE

- Born: 30cm. Mature: 117–159cm ♀, 77–121cm ♂. Max TL: 180cm<sup>i</sup>.
- Feed predominately on bony fish, along with squid, crustaceans and chondrichthyans<sup>v</sup>.
- Large, pelagic fish such as tuna and bonito recorded from stomachs contents, presumably scavenged<sup>iii</sup>.

## TEETH



- Triangular, serrated lower teeth.
- Slender, awl shaped upper teeth sloping toward the corners of the mouth<sup>ii</sup>.



## HABITAT

- 37–1,800m. Most common below 200m.
- Usually demersal but often caught in the water column.
- Does not appear to form schools or aggregations<sup>i</sup>.

## CONSERVATION STATUS

- Extremely vulnerable to fishing pressure<sup>iv</sup>. When targeted by an industrial fleet in the Azores, landings declined by 98% in 7 years<sup>vi</sup>.
- Red List status:** Near Threatened (2008). Vulnerable in the northeast Atlantic.

## COMMERCIAL IMPORTANCE

- Targeted for its liver oil throughout its range, particularly by Japan and South Africa.
- Primarily used for fishmeal in the East Atlantic.
- No commercial interest in the West Atlantic<sup>i</sup>.
- 2010 – Subject to a zero TAC in EU waters.

## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

- Bester, C. *et al*; Unknown. FLMNH.
- Bigelow, H. B. *et al*; 1953. US Government Printing Office.
- Compagno, L. J. V.; 1984. FAO.
- Compagno, L. J. V. *et al*; 2008. IUCN Red List.
- Cortés, E.; 1999. *ICES JMS*.
- Perrotta, R. G.; 2004. *Rev. Invest. Desarr. Pesq.*

## SIMILAR SPECIES



*Dalatias licha*, Kitefin Shark



*Scymnodon ringens*, Knifetooth Shark

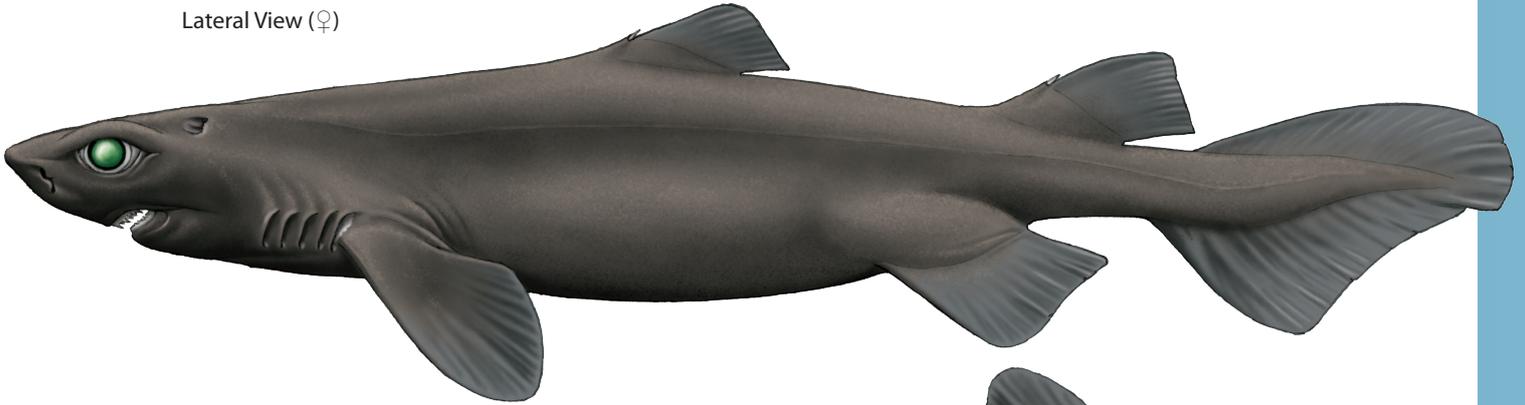


*Centroscymnus coelolepis*, Portuguese Dogfish

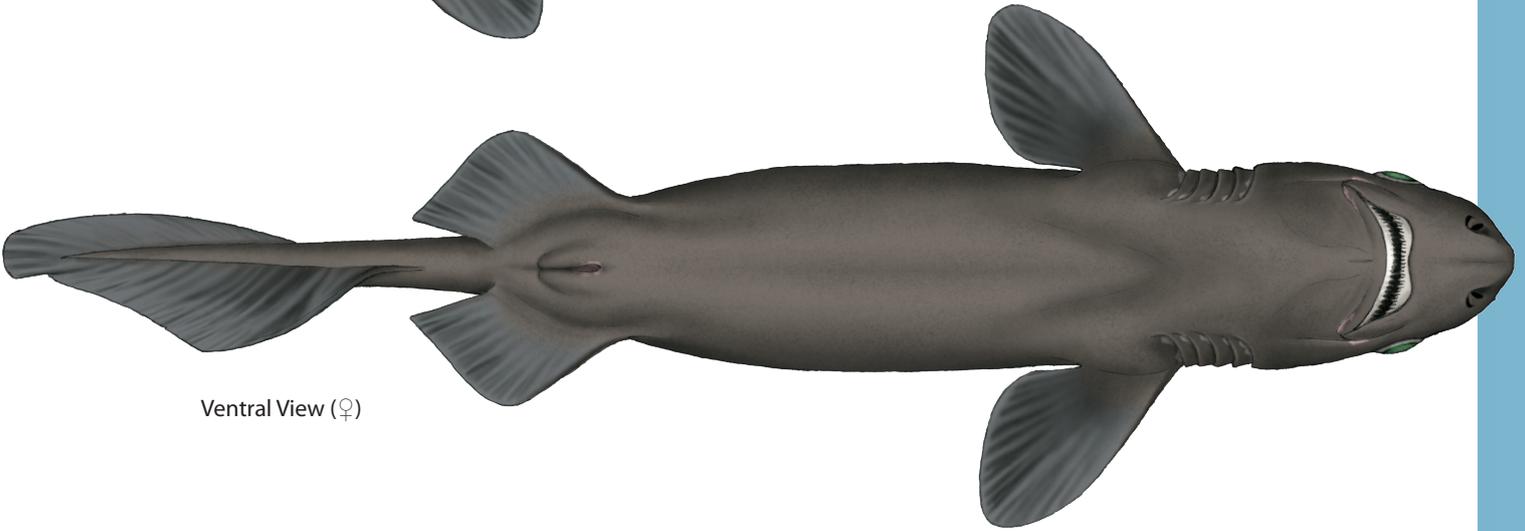


*Zameus squamulosus*, Velvet Dogfish

Lateral View (♀)



Ventral View (♀)



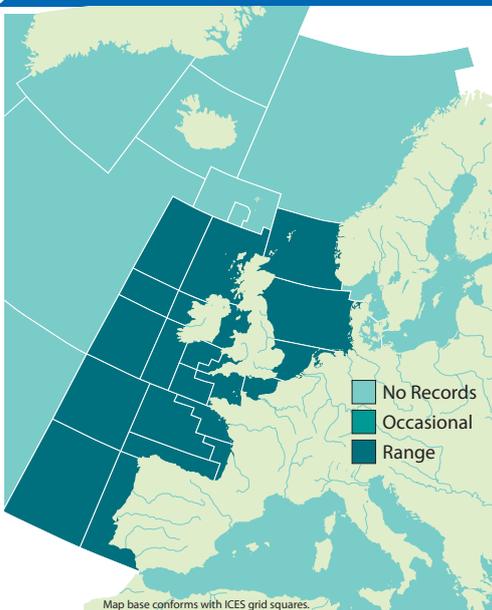
### COMMON NAMES

**Knifetooth Dogfish**, Squale-Grogneur Commun (Fr), Bruja (Es).

### SYNONYMS

*Centrophorus ringens* (Günther, 1870).

### DISTRIBUTION



The Knifetooth Dogfish is known only from the east Atlantic from Scotland to Spain, Portugal and Senegal (Compagno, 1984).

### APPEARANCE

- Thick, high head with broad, short snout.
- Pectoral fins narrow.
- Caudal fin has no ventral lobe and a weak sub-terminal notch.
- First dorsal fin set well behind pectoral fins.
- Second dorsal fin smaller than first.
- Small dorsal spines.
- No anal fin.
- Very wide, broadly arched mouth.
- Small lanceolate teeth without cusplets in upper jaw.
- Huge, knife-cusped teeth in lower jaw.
- Uniform black colour.
- Maximum length 110cm.

The Knifetooth Dogfish is a stout deepwater shark with a short snout and thick head. Its mouth is very wide and broadly arched containing distinctive teeth. In the upper jaw they are small and lanceolate without cusplets. In the lower jaw however they are huge and knife-like, suggesting an ability to attack and dismember large prey.

The pectoral fins are narrow and leaf-shaped. The first dorsal fin is small and set well behind the pectoral fins. The second dorsal fin is slightly larger than the first and is set behind the pelvic fins. Both have small dorsal spines. There is no anal fin. The caudal fin has a long dorsal lobe with no ventral lobe. There is a weak terminal notch. The colouration is plain black with no patterning. The maximum recorded length is 110cm (Compagno, 1984).

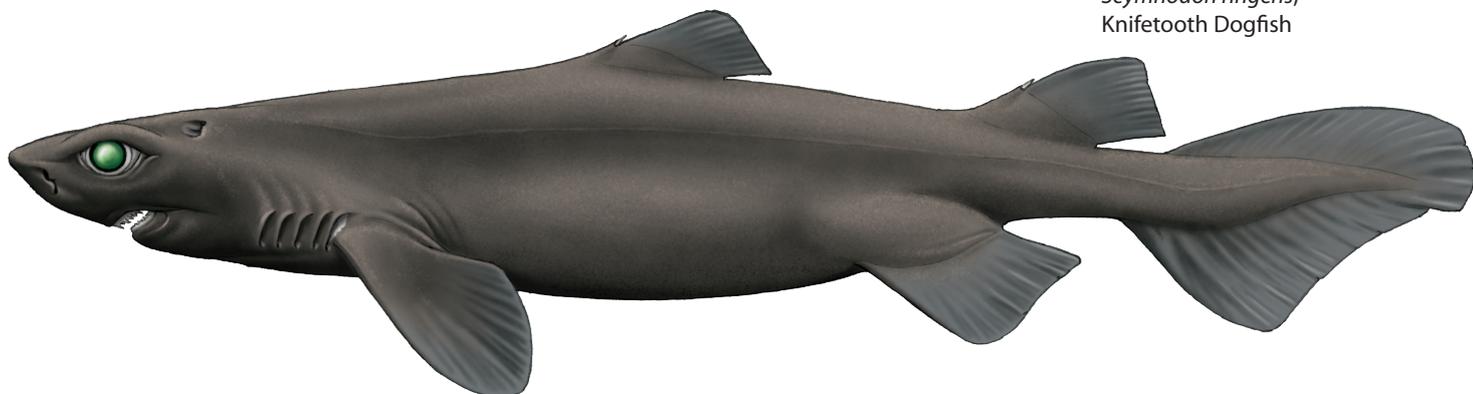
## SIMILAR SPECIES

*Centroscyllium fabricii*, Black Dogfish

*Centroscyrnus coelolepis*, Portuguese Dogfish

*Dalatias licha*, Kitefin Shark

*Scymnodon ringens*,  
Knifetooth Dogfish



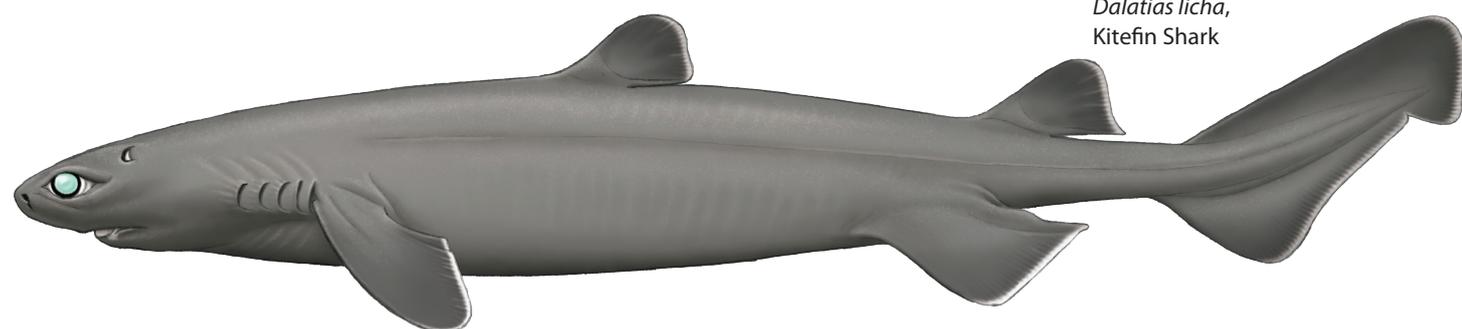
*Centroscyllium fabricii*,  
Black Dogfish



*Centroscyrnus coelolepis*,  
Portuguese Dogfish



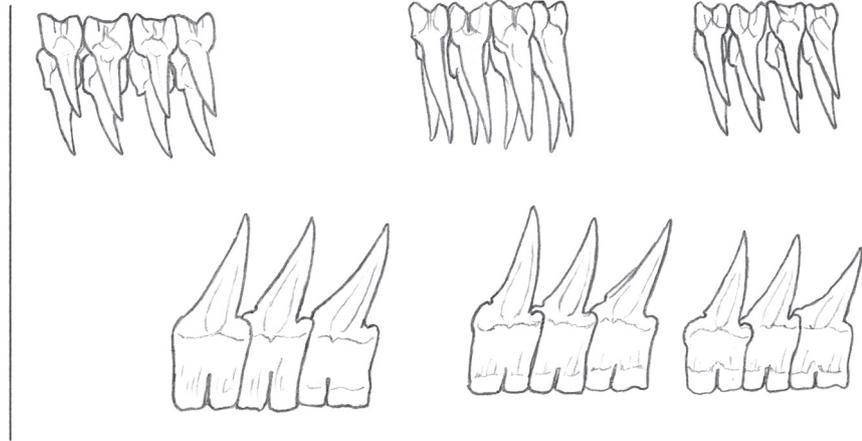
*Dalatias licha*,  
Kitefin Shark



(Not to scale)

### TEETH

Small lanceolate upper teeth without cusplets. Huge, knife-cusped lower teeth (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Knifetooth Dogfish is a benthic to mesopelagic species found from 200–1,600m (Compagno, 1984).

#### EGGCASE

N/A

#### DIET

The diet of the Knifetooth Dogfish is essentially unknown although its dentition suggests the ability to attack and dismember large prey (Compagno, 1984).

#### REPRODUCTION

Unknown but most likely to be ovoviviparous (Compagno, 1984).

## COMMERCIAL IMPORTANCE

The Knifetooth Dogfish is taken as bycatch in bottom trawl, line gear and fixed bottom net fisheries throughout its range. It is of little or no commercial value although it is sometimes used for fishmeal or dried for human consumption (Gibson *et al.*, 2006).

## THREATS, CONSERVATION, LEGISLATION

The Knifetooth Dogfish is reportedly relatively common in the east Atlantic although few have been found west of Scotland. No species specific landings data is available so populations are difficult to quantify. Deep sea sharks as a group are particularly vulnerable to fishing pressure so future monitoring of catches is essential (Gibson *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Data Deficient (2008).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Small dorsal spines.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

- BLASDALE, T., VALENTI, S. V. 2008. *Scymnodon ringens*. In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.1. [www.iucnredlist.org](http://www.iucnredlist.org)
- COMPAGNO, L. J. V. 1984. Sharks of the World: An Annotated and Illustrated Catalogue of Shark Species Known to Date. Volume 4, Part 1. Hexanchiformes to Lamniformes. FAO. Rome, Italy.
- GIBSON, C., VALENTI, S. V., FOWLER, S. L., FORDHAM, S. V. 2006. The Conservation Status of Northeast Atlantic Chondrichthyans; Report of the IUCN Shark Specialist Group Northeast Atlantic Regional Red List Workshop. VIII + 76pp. IUCN SSC Shark Specialist Group.

Text: Richard Hurst.  
Illustrations: Marc Dando.

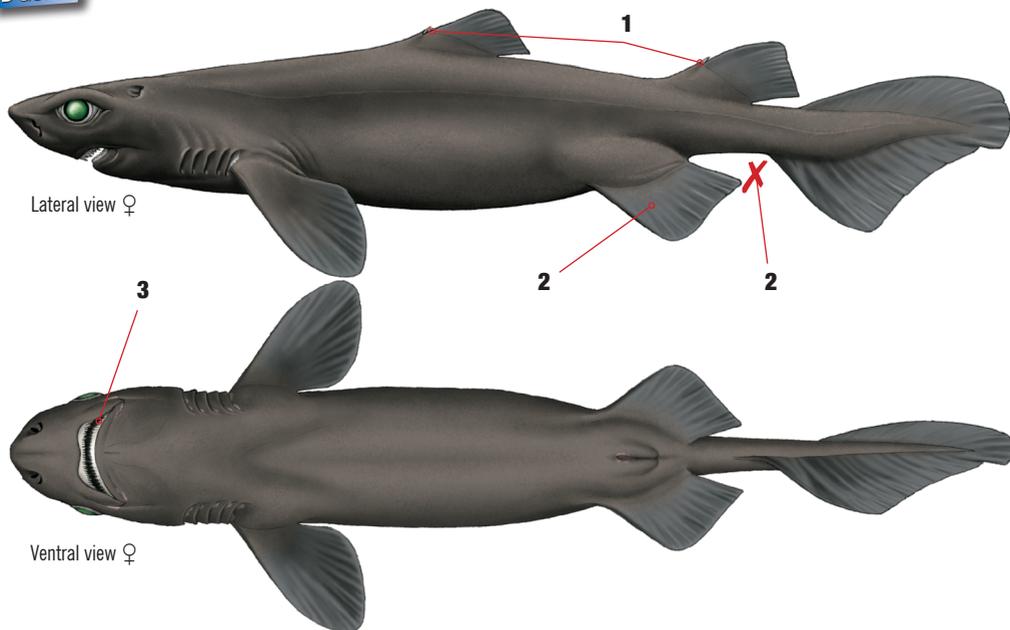
### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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For more ID materials visit [www.sharktrust.org/ID](http://www.sharktrust.org/ID).

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Lateral view ♀

Ventral view ♀

## SCIENTIFIC NAME

*Scymnodon ringens* (Bocage and Capello, 1864).

## DISTRIBUTION

East Atlantic from Scotland to Spain, Portugal and Senegal. Unconfirmed reports from New Zealand<sup>ii</sup>.



## COMMON NAME

**KNIFETOOTH DOGFISH**, Squale-Grogneur Commun (Fr), Bruja (Es).

## IDENTIFICATION

- 1 Small dorsal spines.
- 2 Large pectoral and pelvic fins, no anal fin.
- 3 Mouth very wide and broadly arched<sup>ii</sup>.

## COLOUR

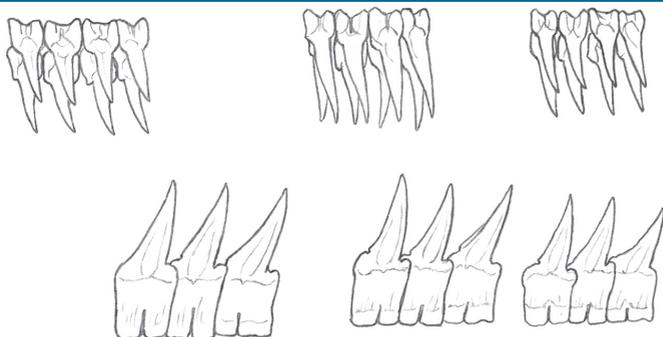
- Uniform black in colour.
- No obvious pattern<sup>ii</sup>.

## BIOLOGY AND SIZE

- Max TL: 110cm<sup>ii</sup>.
- Poorly understood but most likely ovoviparous.
- Dentition suggests the ability to dismember relatively large prey<sup>ii</sup>.

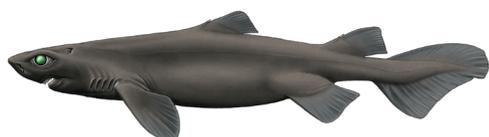


## TEETH



- Small lanceolate upper teeth without cusplets.
- Large, knife-cusped lower teeth<sup>ii</sup>.

## SIMILAR SPECIES



- *Scymnodon ringens*, **Knifetooth Dogfish**



- *Centroscyllium fabricii*, **Black Dogfish**



- *Centroscymsus coelolepis*, **Portuguese Dogfish**



- *Dalatias licha*, **Kitefin Shark**

## HABITAT

- Benthic to mesopelagic from 200–1,600m<sup>ii</sup>.
- Found on continental slopes.

## CONSERVATION STATUS

- Relatively common in the East Atlantic although few have been recorded west of Scotland. No species specific landing data available although it is likely to be vulnerable to fishing pressure<sup>i</sup>.
- **Red List status:** Data Deficient (2008).

## COMMERCIAL IMPORTANCE

- Taken as bycatch in bottom trawl, line gear and fixed bottom net fisheries.
- Of little commercial interest and usually discarded.
- If landed, can be utilised for human consumption, the liver can be rendered for oil and the carcass can be processed for fishmeal<sup>i</sup>.

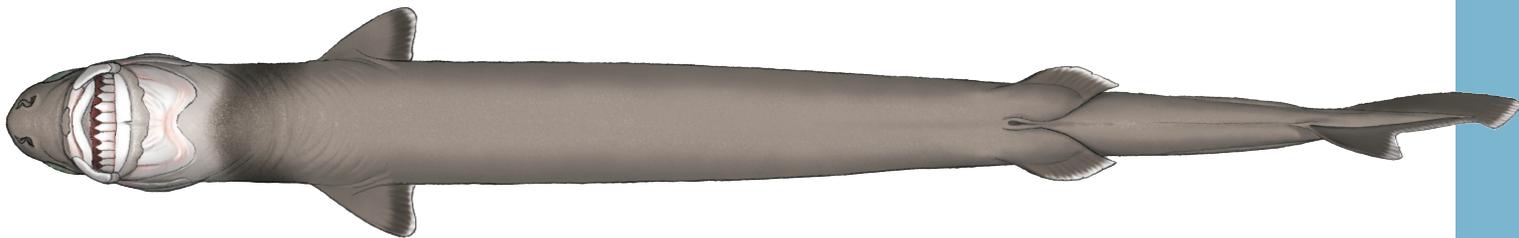
## HANDLING

- Handle with care.
- Small dorsal spines.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

- Blasdale, T. *et al*; 2008. IUCN Red List.
- Compagno, L. J. V.; 1984. FAO.

Lateral View (♀)



Ventral View (♀)

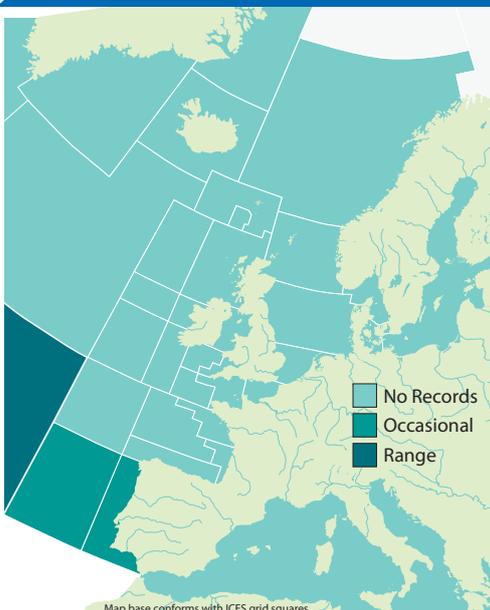
### COMMON NAMES

*Bigtooth Cookiecutter Shark*, Largetooth Cookiecutter Shark, Longtooth Cookiecutter Shark, Gulf Dogfish, Squalelet Dentu (Fr), Tollo Cigarro Dentón (Es).

### SYNONYMS

None.

### DISTRIBUTION



Until recently, the Bigtooth Cookiecutter Shark was known only from the western North Atlantic (Gulf of Mexico) and western North Pacific (Okinawa) (Compagno, 1984). Specimens have now been described from Western Sahara, Brazil, Australia and north of the Azores (Zidowitz *et al.*, 2004).

### APPEARANCE

- Small, cigar shaped body.
- Spineless, equal-sized dorsal fins set well back on the body.
- No anal fin.
- Heterocercal caudal fin with short ventral lobe.
- Very short, bulbous snout.
- Huge, triangular lower teeth.
- Uniform brownish colouration with no dark collar.

A small, cigar shaped shark, the Bigtooth Cookiecutter Shark grows to a maximum size of at least 42cm. Its most distinctive feature is its dentition; its lower teeth are proportionally the largest of any elasmobranch. Its snout is short and bulbous with its eyes set further forward than the Cookiecutter Shark, *Isistius brasiliensis*, giving it a binocular field of vision. Its dorsal fins are equal in size and set well back on the body, the first originating slightly anterior to the pelvic fins, and lack dorsal spines. There is no anal fin and the ventral lobe of the caudal fin is short (Compagno, 1984).

Like the Cookiecutter Shark the colouration is uniformly dark brown but there is no darker collar present. There may be darker colouration on the throat around the pectoral fins but this does not extend onto the flanks or back (Zidowitz *et al.*, 2004).

## SIMILAR SPECIES

*Isistius brasiliensis*, Cookiecutter Shark

*Etmopterus princeps*, Great Lanternshark

*Etmopterus pusillus*, Smooth Lanternshark

*Etmopterus spinax*, Velvet Belly Lanternshark

*Centroscyllium fabricii*, Black Dogfish

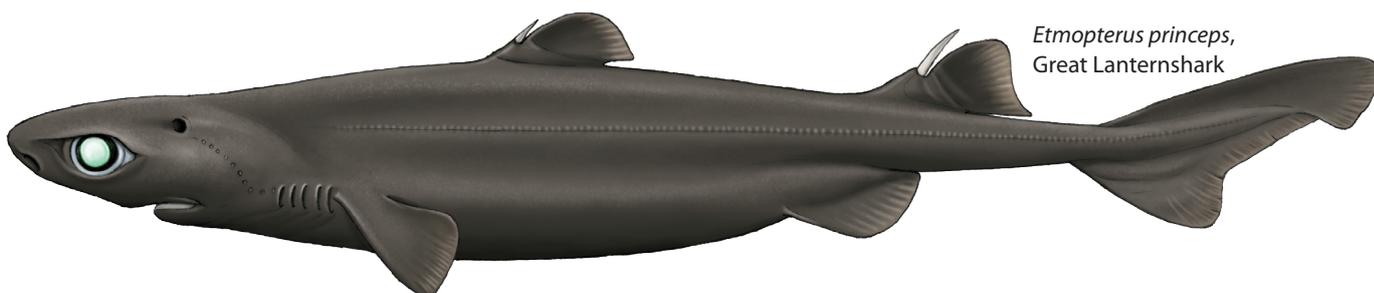
*Isistius plutodus*,  
Largetooth Cookiecutter Shark



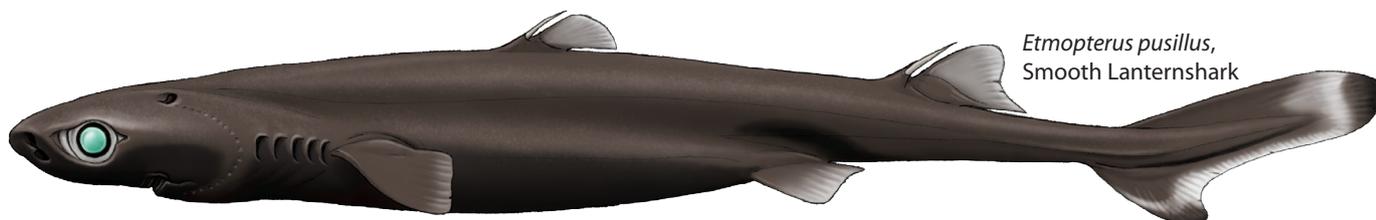
*Isistius brasiliensis*,  
Cookiecutter Shark



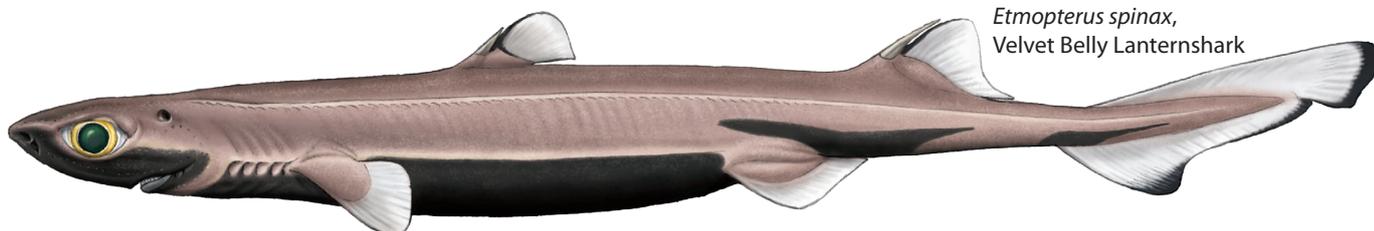
*Etmopterus princeps*,  
Great Lanternshark



*Etmopterus pusillus*,  
Smooth Lanternshark



*Etmopterus spinax*,  
Velvet Belly Lanternshark



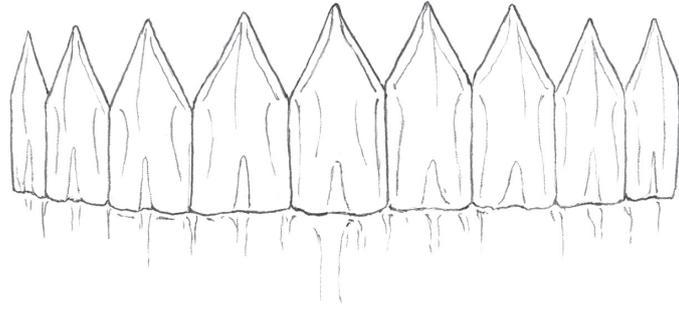
*Centroscyllium fabricii*,  
Black Dogfish



(Not to scale)

### TEETH

The lower teeth are huge and triangular-cusped, arranged into 19 rows. These are proportionally the largest teeth of any shark. There are large suction lips (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

As only 10 specimens of the Bigtooth Cookiecutter Shark have been recorded, its ecology and biology are poorly understood. All records so far are either epibenthic over continental shelves around 100m in depth or epipelagic over continental slopes (bottom depths 815–2,060m) from 60–120m. A specimen from the Riu-Kyu Trench was taken at 200m over a bottom depth of 6,440m (Kyne *et al.*, 2006).

#### EGGCASE

N/A

### DIET

Like the Cookiecutter Shark, *Isistius brasiliensis*, the Bigtooth Cookiecutter Shark is an ectoparasite which gouges conical chunks of flesh from large animals. Unlike the Cookiecutter Shark, it can apparently also gouge elongated plugs from its victims using a different, as yet unknown cutting action. It presumably also feeds on small epibenthic and epipelagic invertebrates and fish (Compagno, 1984).

### REPRODUCTION

The reproductive cycle of the Bigtooth Cookiecutter Shark is unknown but it is presumably ovoviviparous (Kyne *et al.*, 2006).

## COMMERCIAL IMPORTANCE

The Bigtooth Cookiecutter Shark is very rarely caught in trawl and longline fisheries and is of no commercial interest (Kyne *et al.*, 2006).

## THREATS, CONSERVATION, LEGISLATION

As the Bigtooth Cookiecutter Shark is so rarely caught it is assumed that that majority of the population exists beyond the current depth range of commercial fisheries, meaning there is very little threat to the species. However, inadequate reporting of deep sea sharks, confusion with other species and the species' apparently low abundance mean that future catches should be carefully monitored (Kyne *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Least Concern (2006).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large, sharp teeth.
- Abrasive skin.

### REFERENCES

- COMPAGNO, L. J. V. 1984. FAO Species Catalogue, Vol. 4, Part 1: Sharks of the World. An Annotated and Illustrated Catalogue of Shark Species Known to Date. FAO. Rome, Italy.
- KYNE, P. M., GERBER, L., SHERRILL-MIX, S. A. 2006. *Isistius plutodus*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.1. [www.iucnredlist.org](http://www.iucnredlist.org).
- ZIDOWITZ, H., FOCK, H. O., PUSCH, C., VON WESTERNHAGEN, H. 2004. A first record of *Isistius plutodus* in the north-eastern Atlantic. *Journal of Fish Biology*, 64: 1430-1434.

Text: Richard Hurst.  
Illustrations: Marc Dando.

#### Citation

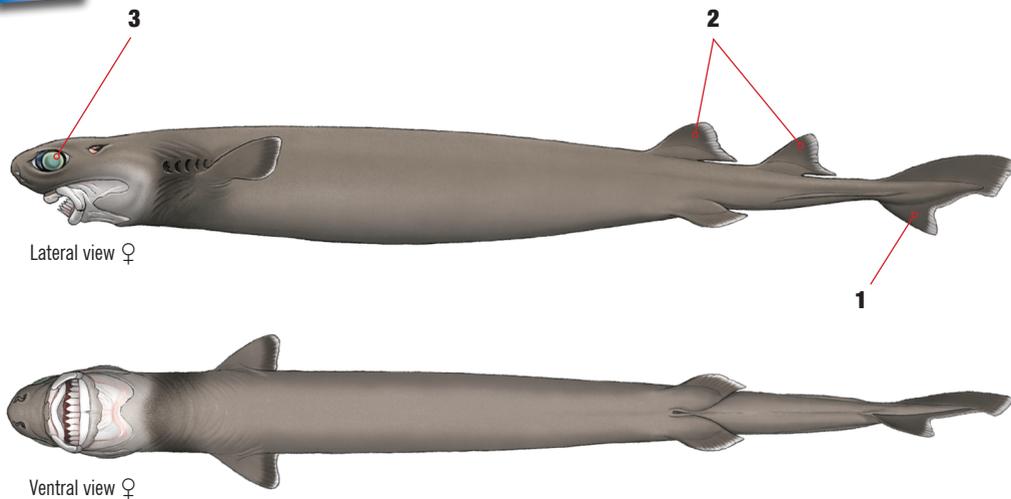
Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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# Large-tooth Cookiecutter Shark *Isistius plutodus*

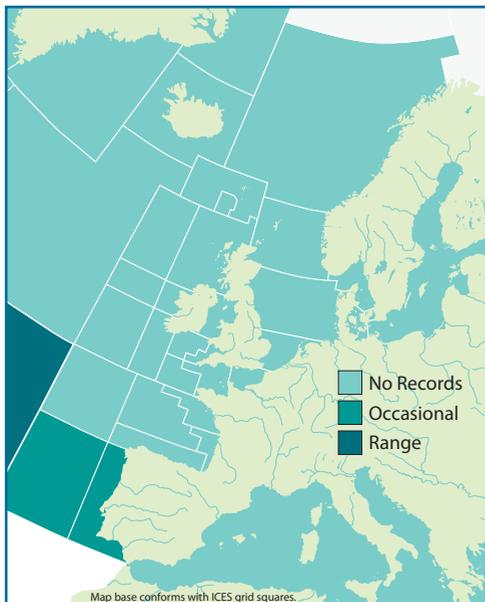


## SCIENTIFIC NAME

*Isistius plutodus* (Garrick & Springer, 1964).

## DISTRIBUTION

Possibly circumglobal but patchy records. Northeast Atlantic from the Azores and Western Sahara<sup>iii</sup>.



## COMMON NAME

**LARGETOOTH COOKIECUTTER SHARK**, Bigtooth Cookiecutter Shark, Longtooth Cookiecutter Shark, Gulf Dogfish, Squalalet Dentu (Fr), Tollo Cigarro Dentón (Es).

## IDENTIFICATION

- 1** Asymmetrical caudal fin with short ventral lobe.
- 2** Small, spineless dorsal fins set back above pelvic fins.
- 3** Eyes set forward giving binocular vision<sup>i</sup>.

## COLOUR

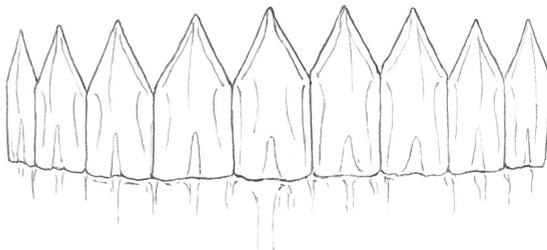
- Uniform brown colour, may be slightly countershaded.
- May be darker collar ventrally around gills<sup>iii</sup>.

## BIOLOGY AND SIZE

- Max TL: 42cm<sup>i</sup>.
- Parasite on much larger animals, cutting circular and elongated plugs of flesh from them using its large teeth<sup>i</sup>.
- Nothing is known of this species' life history as only a few specimens have been recorded<sup>ii</sup>.

## TEETH

- Huge, triangular cusped lower teeth in 17–19 rows.
- Large, fleshy, suctional lips.
- Proportionally the largest teeth of any shark<sup>i</sup>.



## SIMILAR SPECIES



- *Isistius plutodus*, Largetooth Cookiecutter Shark



- *Isistius brasiliensis*, Cookiecutter Shark



- *Etmopterus princeps*, Great Lanternshark



- *Etmopterus spinax*, Velvet Belly Lanternshark



- *Centroscyllium fabricii*, Black Dogfish

## HABITAT

- Epibenthic and epipelagic from 60–200m.
- Possibly occurs in much deeper water.
- All specimens have been collected relatively close to land.
- Thought to be a weaker swimming, less active shark than the similar Cookiecutter Shark, *Isistius brasiliensis*<sup>ii</sup>.

## CONSERVATION STATUS

- Rare but widespread shark which is infrequently taken in trawl and longline fisheries<sup>ii</sup>.
- **Red List status:** Least Concern (2006).

## COMMERCIAL IMPORTANCE

- Of no commercial interest due to its small size and rarity of capture<sup>ii</sup>.

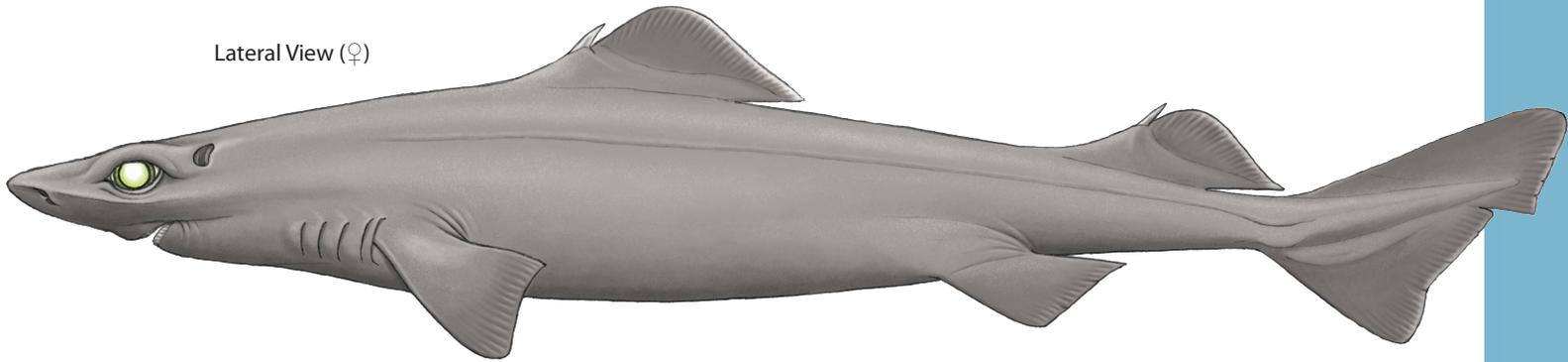
## HANDLING

- Handle with care.
- Large, sharp teeth.
- Abrasive skin.

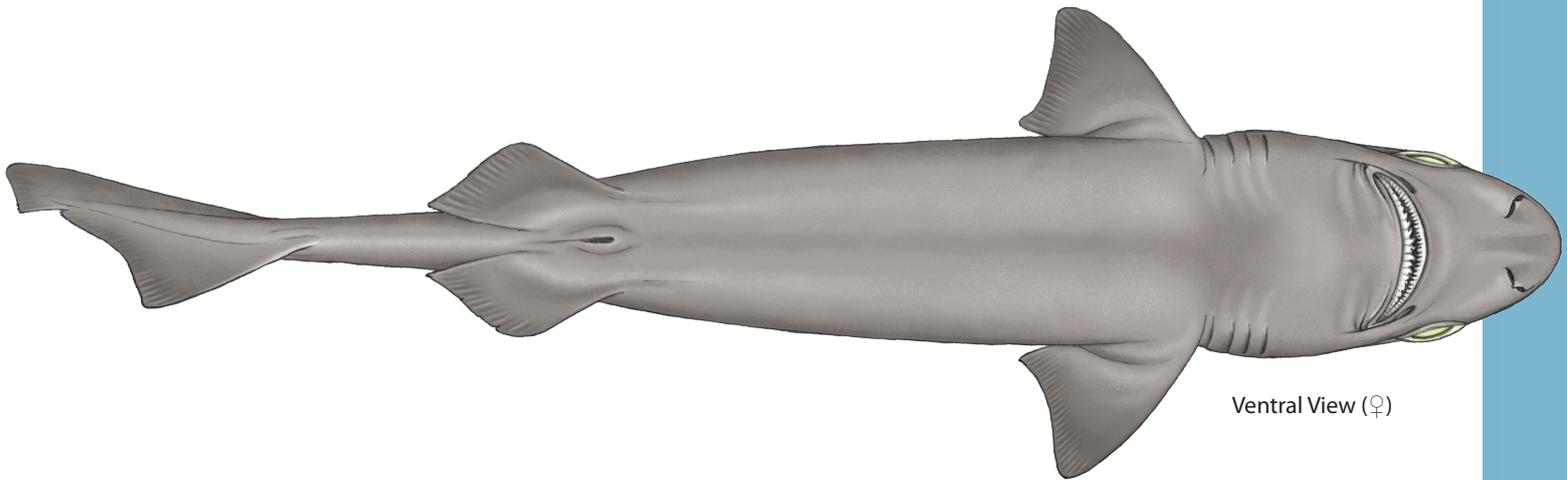
## REFERENCES

- i. Compagno, L. J. V.; 1984. FAO.
- ii. Kyne, P. M. *et al.*; 2006. IUCN Red List.
- iii. Zidowitz, H. *et al.*; 2004. *J. Fish Biol.*

Lateral View (♀)



Ventral View (♀)



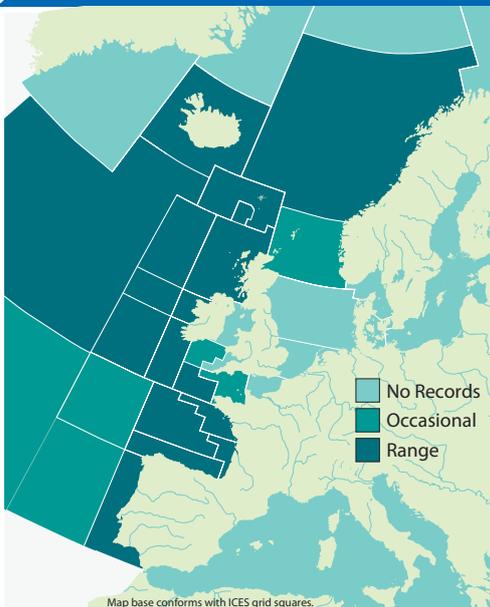
### COMMON NAMES

**Leafscale Gulper Shark**, Deepwater Spiny Dogfish, Nilson's Deepsea Dogfish, Squale-chagrin de l'Atlantique (Fr), Quelvacho Negro (Es).

### SYNONYMS

*Lepidorhinus squamosus* (Bonnaterre, 1788), *Squalus squamosus* (Bonnaterre, 1788), *Acanthorhinus squamosus* (Blainville, 1816), *Lepidorhinus squamosus* (Bonaparte, 1838), *Machephilus dumerili* (Johnson, 1867), *Centrophorus dumerili* (Günther, 1870).

### DISTRIBUTION



In the east Atlantic, the Leafscale Gulper Shark is found from Iceland to South Africa and into the western Indian Ocean. It is also known from west Pacific (Carpenter, 2009).

### APPEARANCE

- Moderately long snout.
- Two dorsal fins with large spines.
- No anal fin.
- Blade-like unicuspidate teeth in both jaws.
- Large eyes green when first caught.
- Grey or grey-brown.
- Maximum length of 158cm.

A moderately sized deep-water shark, the Leafscale Gulper Shark has no anal fin and two dorsal fins with large spines. The free rear tips of these dorsal fins are broadly angular and are not strongly extended. It has a moderately long snout with blade-like unicuspidate teeth in both jaws, the lower set being much larger than the upper. It is grey or grey-brown on both dorsal and ventral surfaces with no obvious patterning. Females mature later than males and at a larger size, although both sexes reach maximum total length of around 150cm. The largest recorded was a 158cm total length female (Compagno, 1984).

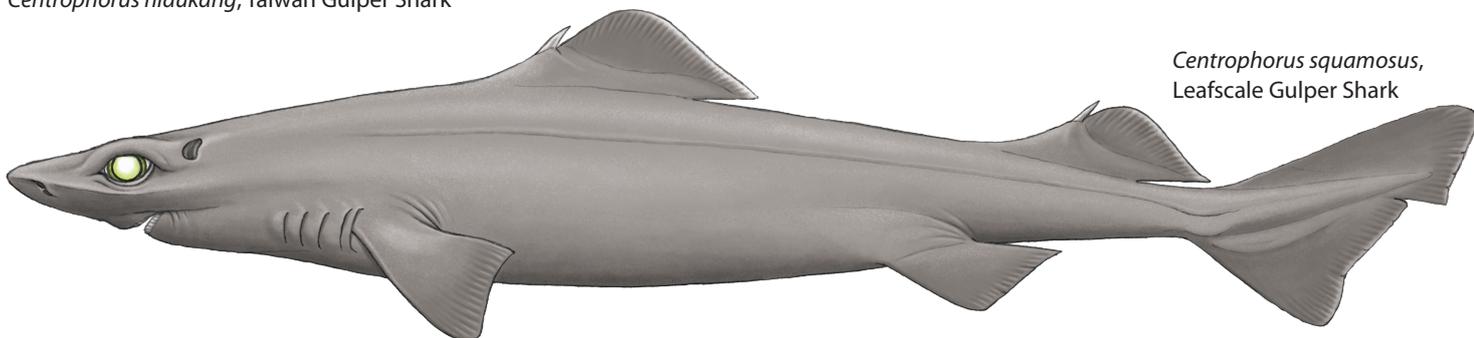


## SIMILAR SPECIES

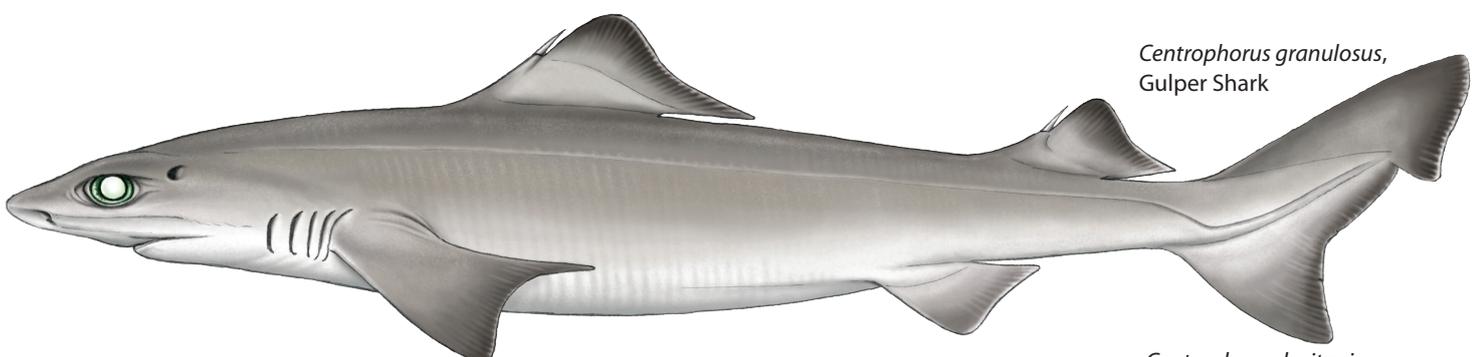
*Centrophorus granulosus*, Gulper Shark

*Centrophorus lusitanicus*, Lowfin Gulper Shark

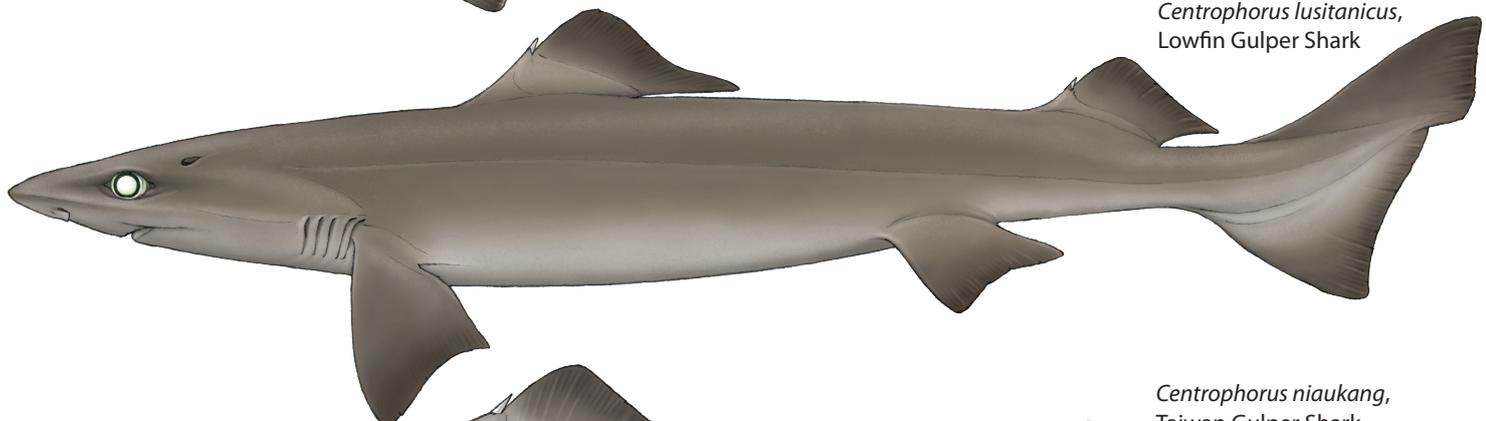
*Centrophorus niaukang*, Taiwan Gulper Shark



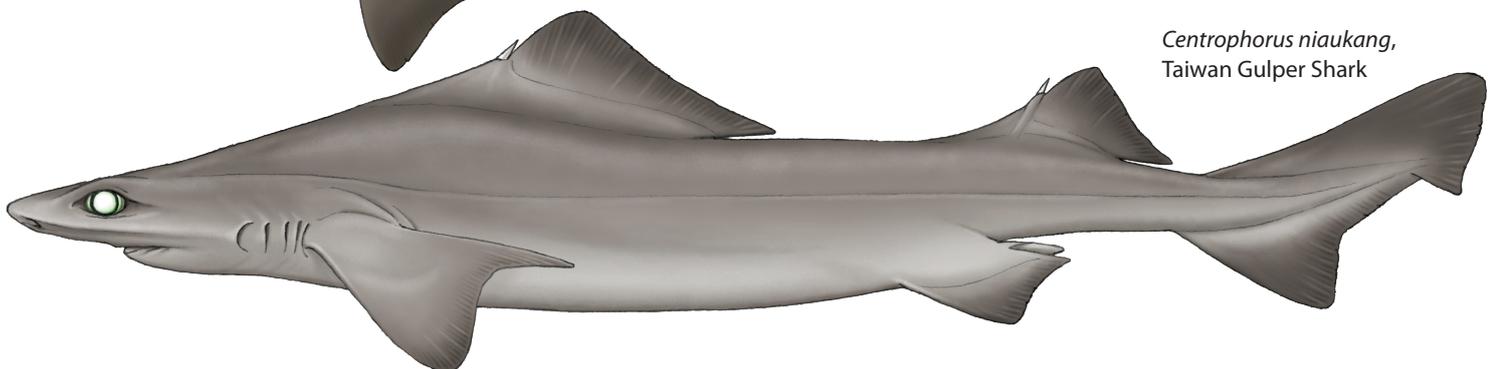
*Centrophorus squamosus*,  
Leafscale Gulper Shark



*Centrophorus granulosus*,  
Gulper Shark



*Centrophorus lusitanicus*,  
Lowfin Gulper Shark



*Centrophorus niaukang*,  
Taiwan Gulper Shark

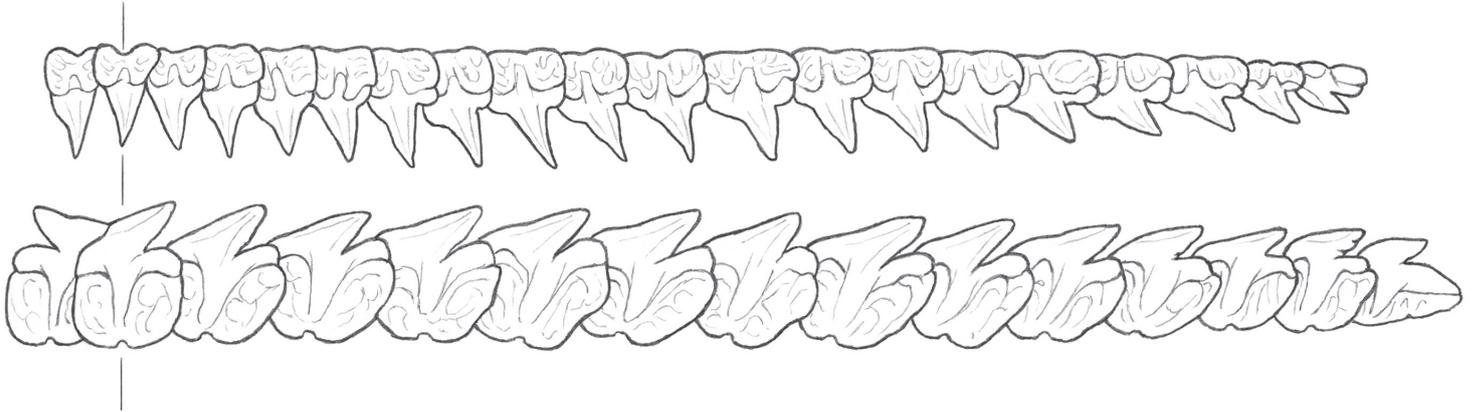
Dermal Denticles of *Centrophorus squamosus*



(Not to scale)

### TEETH

The teeth are blade-like and unicuspidate. The lowers are much larger than uppers (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

Found demersally on continental slopes from 230–2,400m and pelagic in the water column to 1,250m (White, 2003).

#### EGGCASE

N/A

#### DIET

Unknown but presumably feeds on fish and cephalopods (Carpenter, 2009).

### REPRODUCTION

50% of male Leafscale Gulper Sharks are sexually mature at a total length of 100cm, females larger at 125cm. It is an ovoviviparous with 5–8 young in each litter. Little else is known of its reproduction, although no seasonal cycle is apparent in males suggesting that mating occurs throughout the year (White, 2003).

## COMMERCIAL IMPORTANCE

The Leafscale Gulper Shark is an important component of deepwater longline and trawl fisheries off Ireland, Spain, Portugal and France. Its flesh and liver are marketed across much of its range from southeast Asia to Japan and the east Atlantic (White, 2003).

## THREATS, CONSERVATION, LEGISLATION

An important component of deep sea fisheries for many years, the Leafscale Gulper Shark has been commercially exploited across its range. It is targeted particularly heavily by the Portuguese longline fleet and by mixed trawl fleets in the Rockall Trough and Porcupine Bank in the eastern Atlantic. Good quality population data does not currently exist, although declines of 80-90% over 3 years have been observed in some areas of the northeast Atlantic (White, 2003).

In ICES sub-areas V, VI, VII, VIII and IX a Total Allowable Catch (TAC) of 1,646 tons (2008) applies to the deepwater sharks *Centroscyrnus coelolepis*, *Centrophorus granulosus*, *C. squamosus*, *Deania calcea*, *Dalatias licha*, *Etmopterus princeps*, *E. spinax*, *Centroscyllium fabricii*, *Galeus melastomus*, *G. murinus* and all *Apristurus* spp.. Additionally, these species have a TAC of 20 tons in sub-area X and a TAC of 49 tons (including *Deania histricosa* and *D. profundorum*) in sub-area XII (CPOA Shark, 2009).

## IUCN RED LIST ASSESSMENT

Vulnerable (2003).

Endangered in northeast Atlantic.

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large dorsal spines.
- Abrasive skin and sharp teeth.

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Text: Richard Hurst.  
Illustrations: Marc Dando.

### Citation

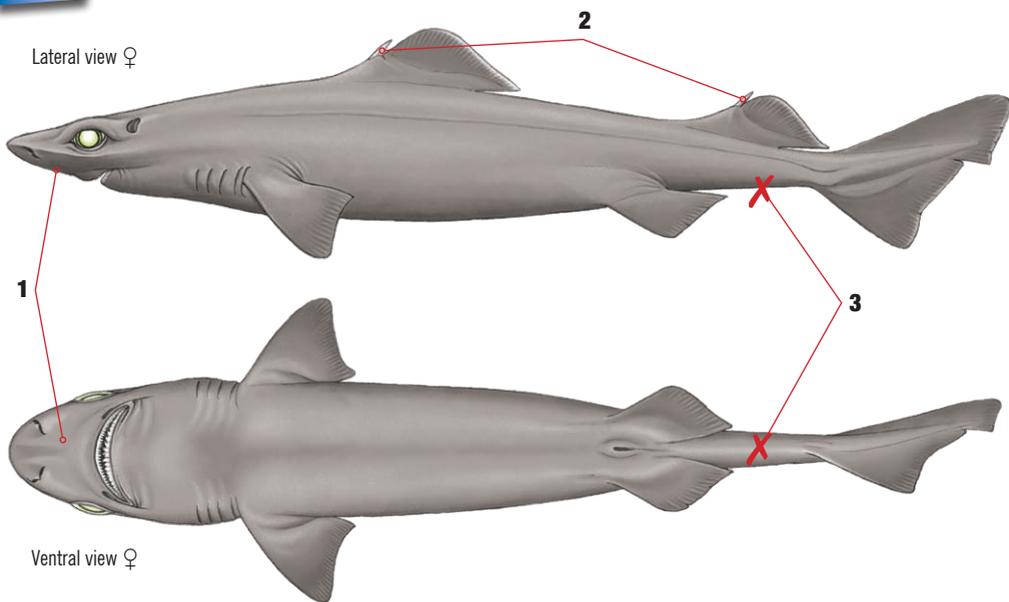
Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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# Leafscale Gulper Shark *Centrophorus squamosus*



Lateral view ♀

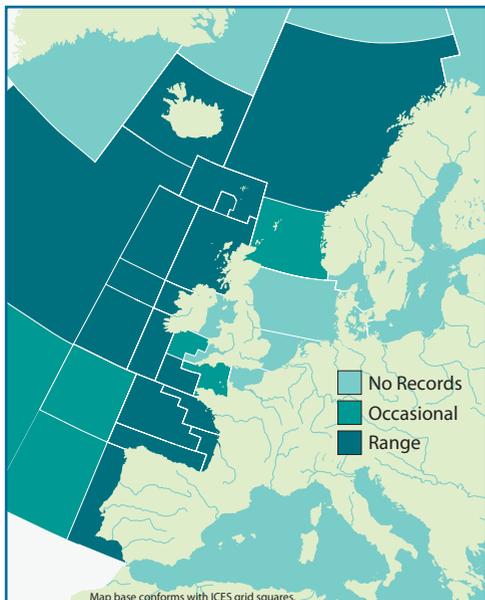
Ventral view ♀

## SCIENTIFIC NAME

*Centrophorus squamosus* (Bonnaterre, 1788).

## DISTRIBUTION

Iceland to South Africa into the western Indian Ocean. Known from New Zealand, the Philippines and Japan<sup>ii</sup>.



## COMMON NAME

**LEAFSCALE GULPER SHARK**, Deepwater Spiny Dogfish, Nilson's Deepsea Dogfish, Squale-Chagrin de l'Atlantique (Fr), Quelvacho Negro (Es).

## IDENTIFICATION

- 1 Moderately long snout.
- 2 Large dorsal spines.
- 3 No anal fin<sup>iv</sup>.

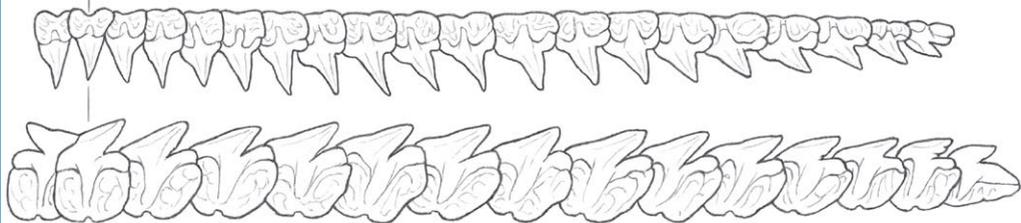
## COLOUR

- ◉ Uniform grey to deep brown and black.
- ◉ No markings or patterns<sup>v</sup>.

## BIOLOGY AND SIZE

- ◉ Born: 30–45cm<sup>vi</sup>. Mature: 110cm ♀, 95cm ♂<sup>i</sup>. Max TL: 158cm<sup>ii</sup>.
- ◉ Feeds presumably fish and cephalopods<sup>v</sup>.
- ◉ One of the oldest living sharks, max age is at least 70 years<sup>iii</sup>.
- ◉ Litters of 5-8 have been recorded<sup>viii</sup>.

## TEETH



- ◉ Blade-like unicuspidate teeth.
- ◉ Lowers much larger than uppers\*.

## SIMILAR SPECIES



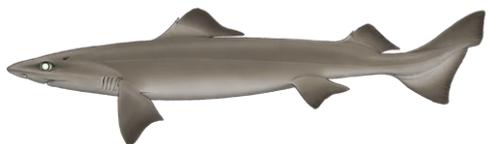
- ◉ *Centrophorus squamosus*, **Leafscale Gulper Shark**



- ◉ *Centrophorus granulosus*, **Gulper Shark**

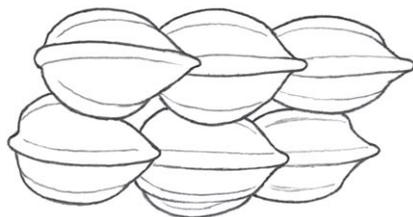


- ◉ *Centrophorus lusitanicus*, **Lowfin Gulper Shark**



- ◉ *Centrophorus niaukang*, **Taiwan Gulper Shark**

## DERMAL DENTICLES



## HABITAT

- ◉ Demersal, 230–3,300m<sup>vii</sup>.
- ◉ Also found pelagically to 1,250m<sup>viii</sup>.

## CONSERVATION STATUS

- ◉ Good population data is rare although declines of 80–90% have been recorded in some areas of the northeast Atlantic<sup>vii</sup>.
- ◉ **Red List status:** Vulnerable (2003). Endangered in northeast Atlantic.

## COMMERCIAL IMPORTANCE

- ◉ Previously an important component of deepwater longline and trawl fisheries.
- ◉ Fished heavily off Ireland, Spain, Portugal and France.
- ◉ Flesh and liver marketed across much of its range<sup>iii</sup>.
- ◉ 2010 – Subject to a zero TAC in EU waters.

## HANDLING

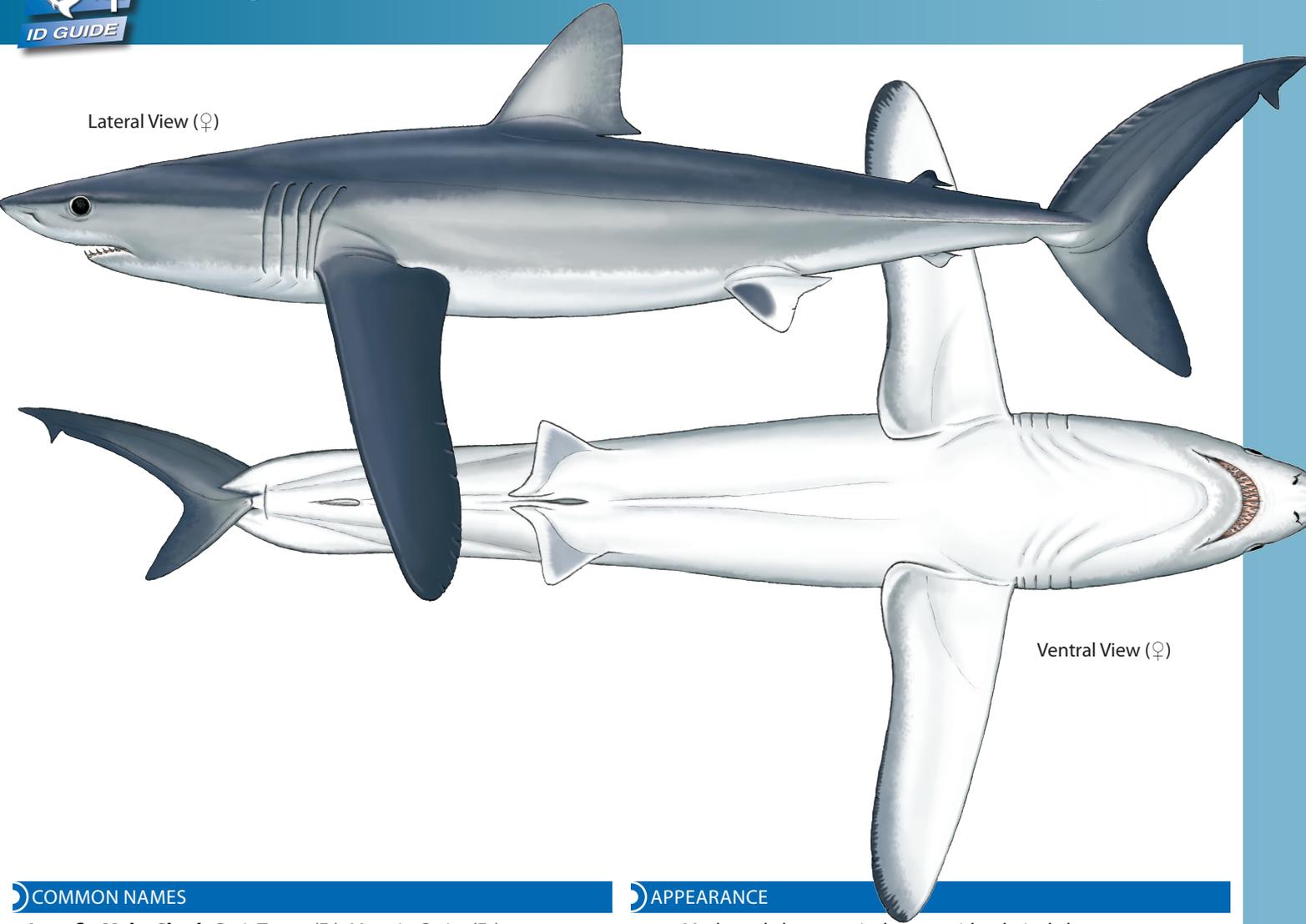
- ◉ Handle with care.
- ◉ Large dorsal spines.
- ◉ Abrasive skin and sharp teeth.

## REFERENCES

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- iii. Clarke, M. W. *et al*; 2002. *J. Fish. Biol.*
- iv. Compagno, L. J. V; 1984. FAO.
- v. Compagno, L. J. V. *et al*; 2005. HarperCollins Publishers.
- vi. Figueiredo, I. *et al*; 2008. *J. Fish. Biol.*
- vii. Fossen, I. *et al*; 2008. *Deep Sea Research*.
- viii. White, W. T; 2003. IUCN Red List.

Lateral View (♀)

Ventral View (♀)



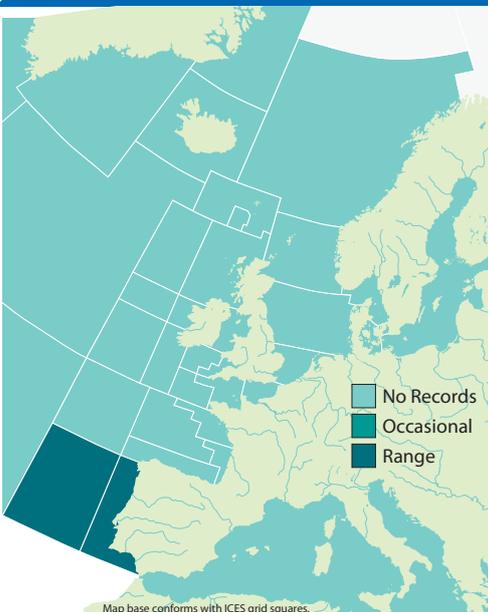
### COMMON NAMES

**Longfin Mako Shark**, Petit Taupe (Fr), Marrajo Carite (Es).

### SYNONYMS

*Lamiostoma belyaevi* (Glikman, 1964), *Isurus alatus* (Garrick, 1967).

### DISTRIBUTION



The distribution of the Longfin Mako Shark is not fully understood but it is probably circumglobal in tropical and warm temperate waters. In the east Atlantic it has been reported from northern Spain to the gulf of Guinea, with two specimens caught north-west of the Azores on swordfish longlines (Queiroz *et al.*, 2006).

### APPEARANCE

- Moderately long, conical snout with relatively large eyes.
- Pectoral fins at least as long as head with broad tips.
- Large first dorsal fin with light free rear tip.
- Minute second dorsal and anal fins.
- Strong caudal keels and lunate caudal fin.
- Dark blue or grey-black dorsolaterally.
- White ventrally
- Underside of snout and mouth dark in adults to pectoral origins.

The Longfin Mako Shark is a slender, pelagic species reaching a maximum length of 417cm and is the second largest species in the Lamnidae family, smaller only than the White Shark, *Carcharodon carcharias* (Martin, Unknown). It can be distinguished from the Shortfin Mako Shark, *Isurus oxyrinchus*, by its larger pectoral fins which are at least as long as its head (measured from the pectoral origins to the tip of the snout) and the underside of the snout and mouth which are dark in adults. The first dorsal fin is large and upright with a light free rear tip, although this is not as prominent as in the Porbeagle Shark, *Lamna nasus*, and may not be seen in all specimens. The second dorsal and anal fins are minute. There is a strong caudal keel and a lunate caudal fin (Compagno, 2001).

Dorsolaterally it is dark slate-blue or grey-black, ventrally white. The underside of the snout and jaw is dark in adults and large juveniles spreading to the origins of the pectoral fins, although it can be pure white in young individuals. In adults, the dark colour of the flanks spreads onto the abdomen and there are dark margins to the underside of the pectoral fins. The dark colouration also expands onto the ventral surface along the caudal peduncle. These changes in colour are well defined but irregular (Wilson and Ford, Unknown).



## SIMILAR SPECIES

*Isurus paucus*, Shortfin Mako Shark

*Lamna nasus*, Porbeagle Shark

*Prionace glauca*, Blue Shark

*Carcharodon carcharias*, White Shark

*Isurus paucus*,  
Longfin Mako Shark

*Isurus oxyrinchus*,  
Shortfin Mako Shark

*Lamna nasus*,  
Porbeagle Shark

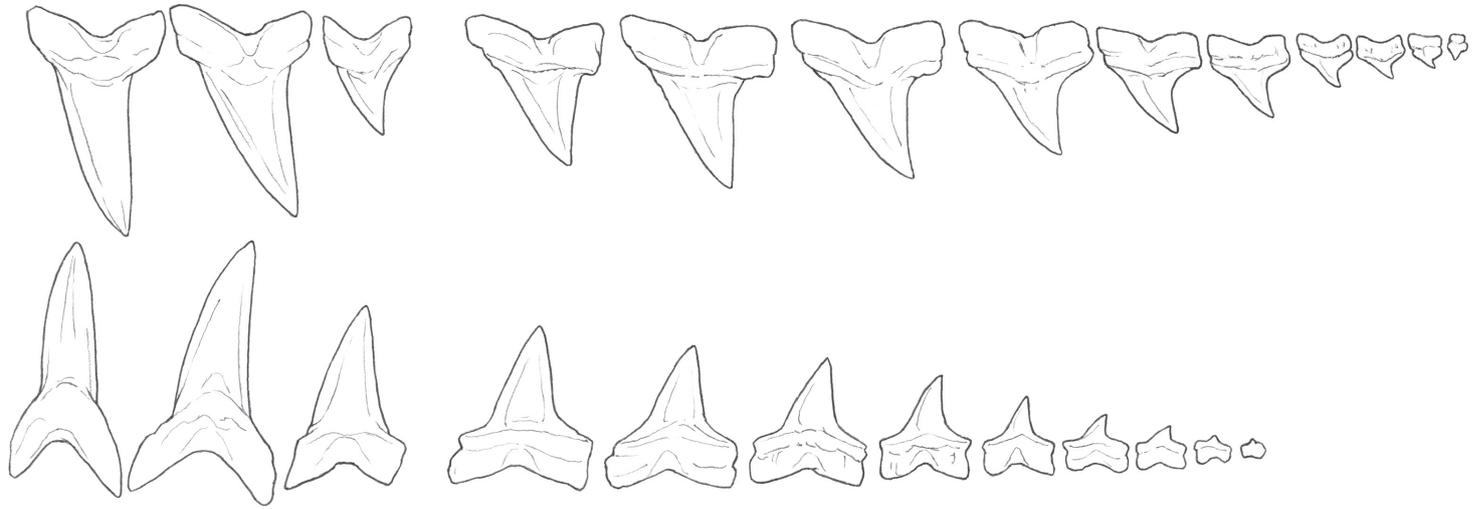
*Prionace glauca*,  
Blue Shark

*Carcharodon carcharias*,  
White Shark

(Not to scale)

### TEETH

Large, slender, monocuspid teeth in both jaws. 24–26 uppers, 22 – 26 lowers (Wilson and Ford, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Longfin Mako Shark is a little known epipelagic shark that apparently spends the majority of its time at depth, although both sightings at the surface and its diet suggest a great depth range. Like other Lamniformes, it has a 'rete mirabile' system that allows it to maintain its body temperature above that of the surrounding water (Martin, 1992). This is a rare trait among fishes, only the mackerel sharks (Lamnidae), tunas (Thunnini) and billfishes (Xiphiidae, Istiophoridae) having evolved the ability (Weng and Block, 2004).

#### EGGCASE

N/A

#### DIET

The Longfin Mako Shark presumably feeds on schooling fish and pelagic cephalopods. A specimen has been found with a swordfish bill embedded in its abdomen, but it is not known if they make up a significant part of its diet (Compagno, 2001). It has been speculated that, rather than a predation event, it was merely an accidental collision as the two predators circled or attacked the same prey, presumably schooling fish (Martin, Unknown).

#### REPRODUCTION

Little is known of the life history of the Longfin Mako Shark. The smallest sexually mature female so far recorded measured 245cm total length, the smallest sexually mature male 229cm total length. It is an aplacental viviparous species utilising oophagy to nourish embryos. Litters of 2–8 young have been reported each measuring 97–120cm. It has been suggested that females move towards land to pup (Reardon, 2006).

## COMMERCIAL IMPORTANCE

There is no commercial market for the meat of the Longfin Mako Shark across much of its range although it can be utilised for human consumption. The fins are not of the highest value but are known to enter the shark fin trade. It may be an important bycatch species for high seas fishing fleets (Reardon *et al.*, 2006).

## THREATS, CONSERVATION, LEGISLATION

Population trends are hard to quantify as catches are inadequately monitored, reported and generally do not include animals finned and discarded at sea. Confusion with other species, particularly the Shortfin Mako Shark, *Isurus oxyrinchus*, also leads to difficulties in detecting population trends. However, it faces significant fishing pressure across its range and is taken as bycatch in the same fishing gear as the Shortfin Mako Shark, a species which has declined by up to 50% in the North Atlantic. Combined with its large size, low fecundity and naturally low abundance, the Longfin Mako Shark is extremely vulnerable to anthropogenic pressure (Reardon *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Vulnerable (2006).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

### REFERENCES

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Text: Richard Hurst.  
Illustrations: Marc Dando.

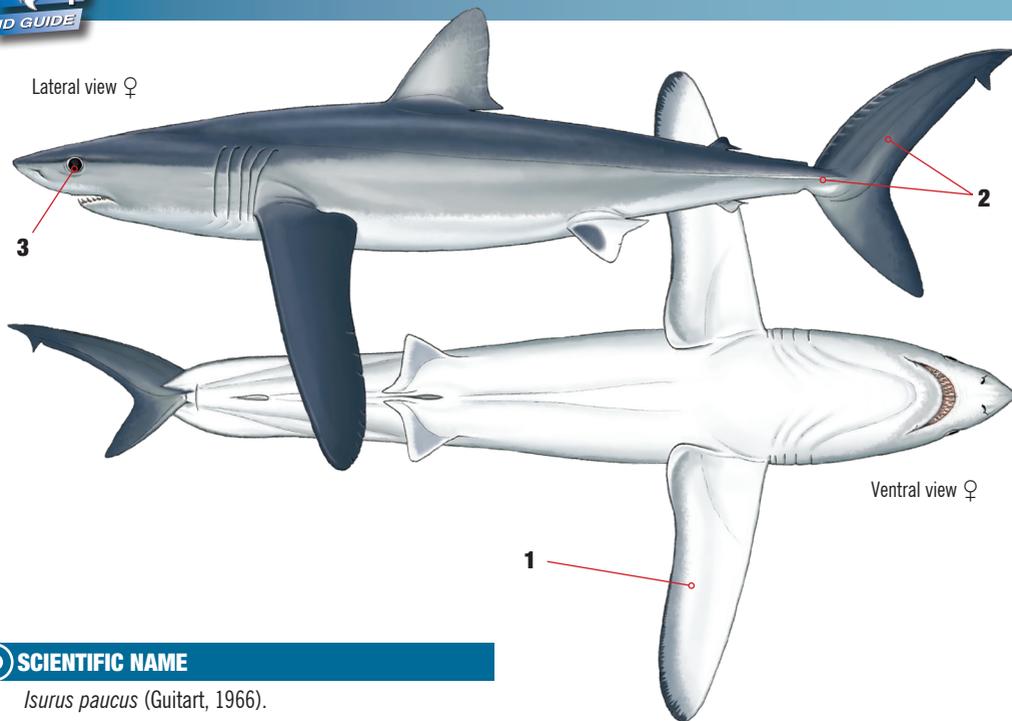
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### SCIENTIFIC NAME

*Isurus paucus* (Guitart, 1966).

### DISTRIBUTION

Probably circumglobal in tropical and warm temperate waters. Patchy in east Atlantic from Spain to Ghana and probably into the Mediterranean Sea<sup>1</sup>.



### COMMON NAME

**LONGFIN MAKO SHARK**, Petit Taupe (Fr), Marrajo Carite (Es).

### IDENTIFICATION

- 1 Broad tipped pectoral fins at least as long as the head.
- 2 Lunate caudal fin with single keel.
- 3 Moderately large eyes<sup>1</sup>.

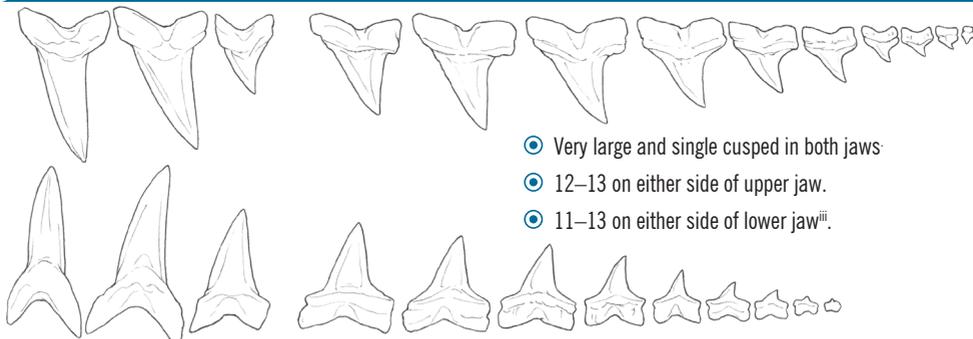
### COLOUR

- Dark slate blue or grey black dorsally.
- Ventrally white.
- Underside of snout and jaws dusky in large individuals<sup>1</sup>.

### BIOLOGY AND SIZE

- Born: 97–120cm. Mature: <245cm ♀, 229cm ♂. Max TL: 417cm<sup>1</sup>.
- 2–8 embryos in each litter. Gestation period is unknown<sup>ii</sup>.
- Very large individuals reported to feed on cetaceans<sup>1</sup>.

## TEETH

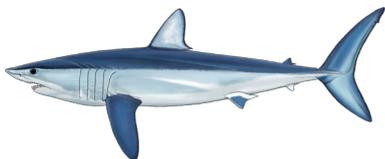


- Very large and single cusped in both jaws
- 12–13 on either side of upper jaw.
- 11–13 on either side of lower jaw<sup>iii</sup>.

## SIMILAR SPECIES



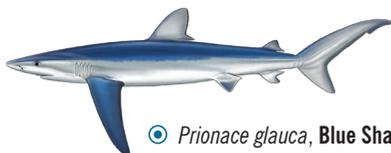
Isurus paucus, Longfin Mako Shark



Isurus oxyrinchus, Shortfin Mako Shark



Lamna nasus, Porbeagle Shark



Prionace glauca, Blue Shark



Carcharodon carcharias, White Shark

## HABITAT

- Thought to be epipelagic and deep dwelling, although depth data is lacking.
- Apparently common in the western Atlantic and central Pacific, although rare elsewhere.
- Can raise its body temperature above that of the surrounding water, allowing it to operate in colder temperate waters<sup>i</sup>.

## CONSERVATION STATUS

- Catches inadequately monitored and underestimated due to confusion with the Shortfin Mako Shark, *Isurus Oxyrinchus*, and discards after finning. Heavy fishing activity across its range is likely to be significant<sup>i</sup>.
- Red List status:** Vulnerable (2006).

## COMMERCIAL IMPORTANCE

- Taken as bycatch in pelagic longline fisheries across its range.
- Some marketed in Tokyo but mostly discarded, generally after finning where legal.
- Meat is not generally appreciated but is marketed fresh and preserved for human consumption<sup>i</sup>.

## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

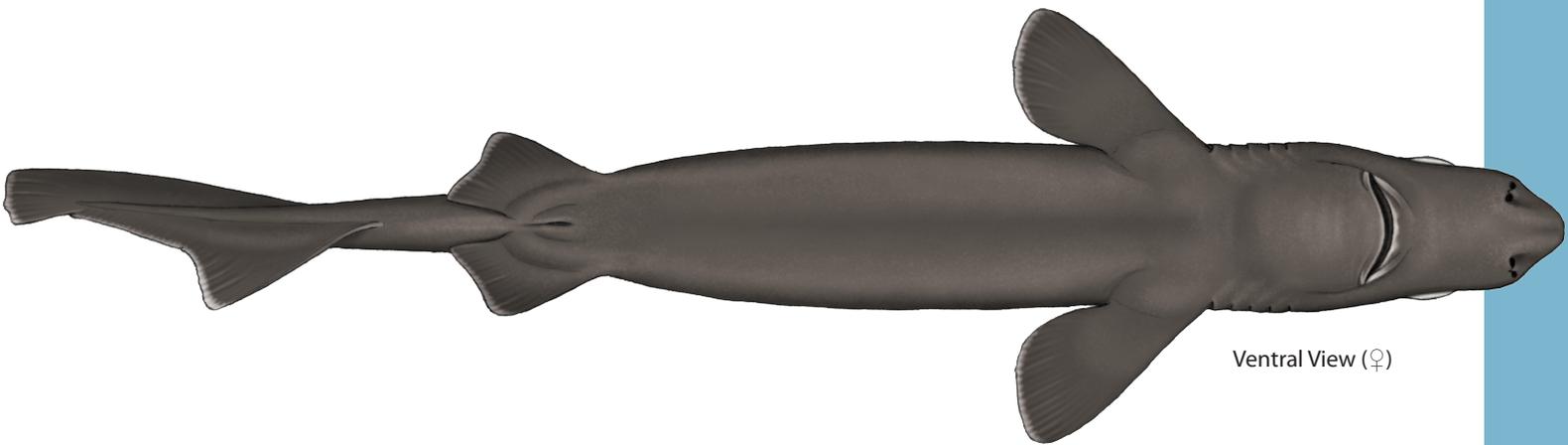
## REFERENCES

- Compagno, L. J. V, *et al*; 2005. HarperCollins Publishers.
- Rearson, M. B. *et al*; 2006. IUCN Red List.
- Wilson, T. *et al*; Unknown. FLMNH.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Longnose Velvet Dogfish**, Deepwater Dogfish, Golden Dogfish, Roughskin Dogfish, Pailona à Long Nez (Fr), Sapata Negra (Es).

### SYNONYMS

*Centroselachus crepidater* (Bocage & Capello 1864), *Centrophorus crepidater* (Bocage and Capello, 1864), *Centrophorus rossi* (Alcock, 1898), *Centrophorus jonsonii* (Saemundsson, 1922), *Centroselachus furvescens* (De Buen, 1959).

### DISTRIBUTION



In the east Atlantic, the Longnose Velvet Dogfish is known from Iceland and the Faroe Islands along the Atlantic slope to Portugal and Madeira. It is also known further south from Gabon to the Democratic Republic of the Congo and Namibia. It is also found in the Indian Ocean and the Pacific Ocean (Compagno, 1984).

### APPEARANCE

- Very long snout. Labial furrows nearly encircle the mouth.
- Slender body.
- Extremely small spine on each dorsal fin.
- Dorsal fins roughly equal in size, squared with expanded bases.
- First dorsal fin base originates over the pectoral base.
- Second dorsal fin situated over the pelvic fins.
- No anal fin.
- Dorsal caudal lobe larger than ventral with subterminal lobe and notch.
- Black or brownish colouration.
- Maximum total length 90cm.

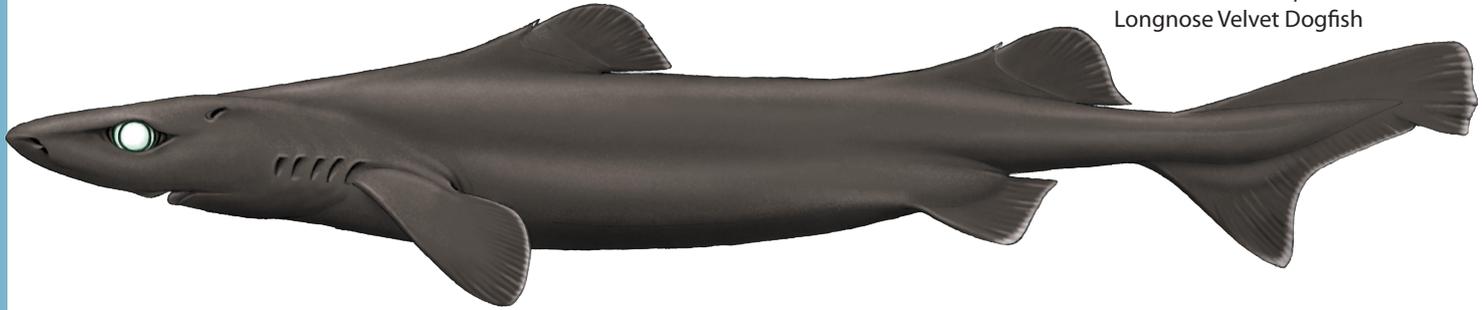
The Longnose Velvet Dogfish is a slender shark with a very long snout and small gill slits. The mouth is nearly encircled by elongated labial furrows. The bases of the dorsal fins are expanded forward in a ridge giving them a squared off appearance. The first originates over the bases of the pectoral fins. The second is situated above the pelvic fins. Both have tiny, inconspicuous spines. The dorsal lobe of the caudal fin is longer than the ventral lobe with a subterminal lobe and notch. There is no anal fin (Compagno, 1984). Adults are black or dark brown with no pattern. The maximum recorded total length is 135cm (Shestopal *et al.*, 2002).

## SIMILAR SPECIES

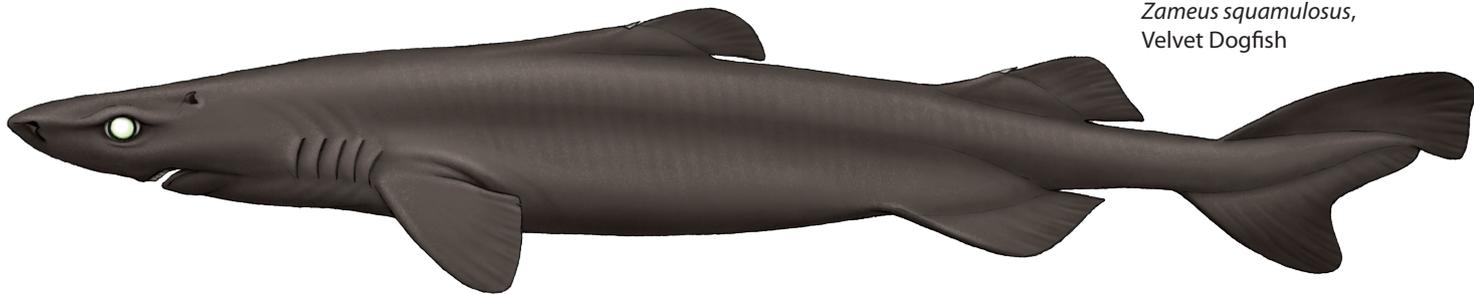
*Zameus squamulosus*, Velvet Dogfish

*Scymnodon ringens*, Knifetooth Dogfish

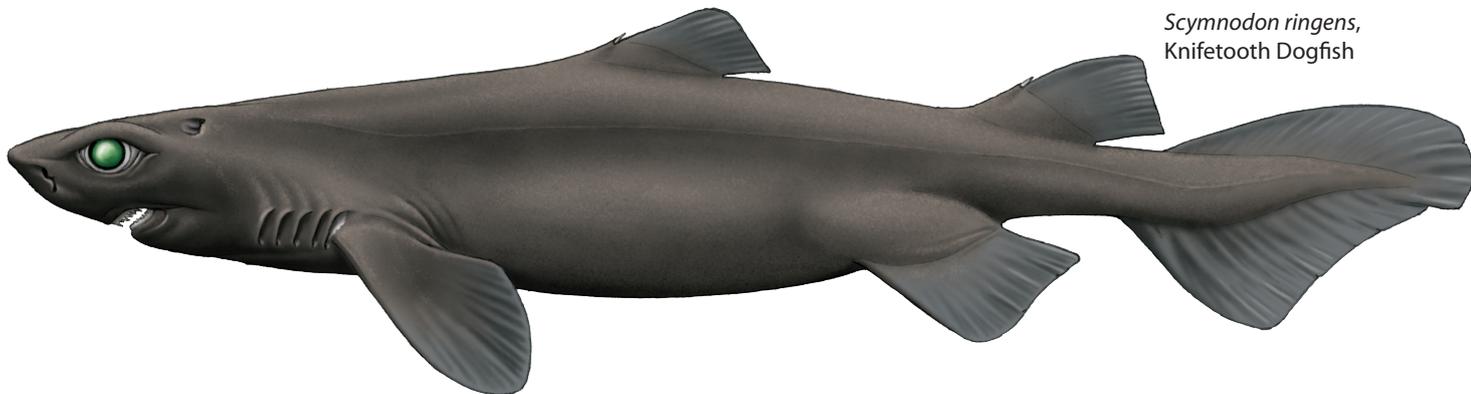
*Dalatias licha*, Kitefin Shark



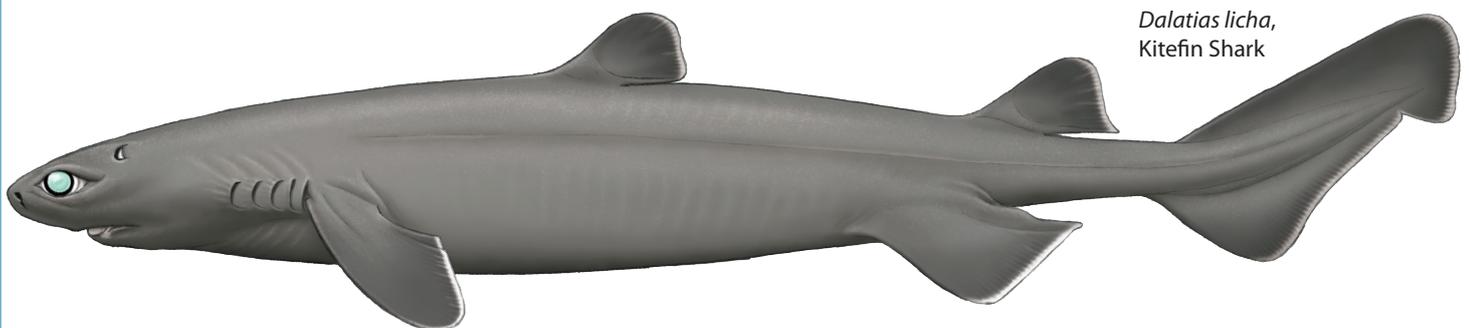
*Centroselachus crepidater*,  
Longnose Velvet Dogfish



*Zameus squamulosus*,  
Velvet Dogfish



*Scymnodon ringens*,  
Knifetooth Dogfish

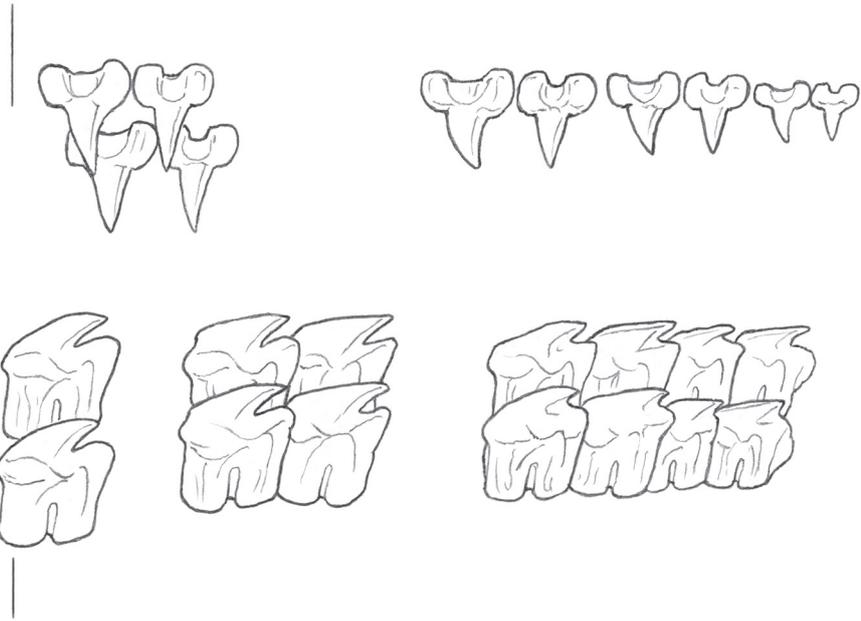


*Dalatias licha*,  
Kitefin Shark

(Not to scale)

### TEETH

The teeth differ between the jaws with the uppers lanceolate and blade-like and the lowers with oblique cusps (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

A demersal species, the Longnose Velvet Dogfish is found on or near the bottom from 270–2,080m, although mostly deeper than 500m (Compagno *et al.*, 2005).

#### EGGCASE

N/A

#### DIET

The Longnose Velvet Dogfish feeds predominantly on bony fish and cephalopods. In Rockall Trough in the northeast Atlantic, the diet was dominated by squid and micronektonic fish including myctophids. This implies that it also feeds off the seabed on benthopelagic species (Stevens, 2003).

#### REPRODUCTION

Very little is known of the reproductive cycle of the Longnose Velvet Dogfish. Males mature at around 15 years of age and a total length of 64cm. Females mature at around 22 years of age and a total length of 82cm. Females breed throughout the year and give birth to litters of 3-9 pups. The gestation period and size at birth are unknown (Stevens, 2003).

## COMMERCIAL IMPORTANCE

The Longnose Velvet Dogfish is mainly a bycatch species in trawl and longline fisheries but with some targeting for its flesh and liver oil. As populations of commercially important deepwater species decline it may become more important (Stevens, 2003).

## THREATS, CONSERVATION, LEGISLATION

The Longnose Velvet Dogfish is mainly a bycatch species in trawl and longline fisheries, although there is some limited targeting for its flesh and oil. Population data for the northeast Atlantic is scarce but the species appears to be relatively abundant. However, late maturity and long gestation periods resulting in few young make most deep sea elasmobranchs vulnerable to intensive fishing pressure and the Longnose Velvet Dogfish is no exception. Catches need to be carefully monitored and management plans implemented if necessary (Stevens, 2003).

## IUCN RED LIST ASSESSMENT

Least Concern (2003).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Dorsal spines.
- Abrasive skin and sharp teeth.

## REFERENCES

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Text: Richard Hurst.  
Illustrations: Marc Dando.

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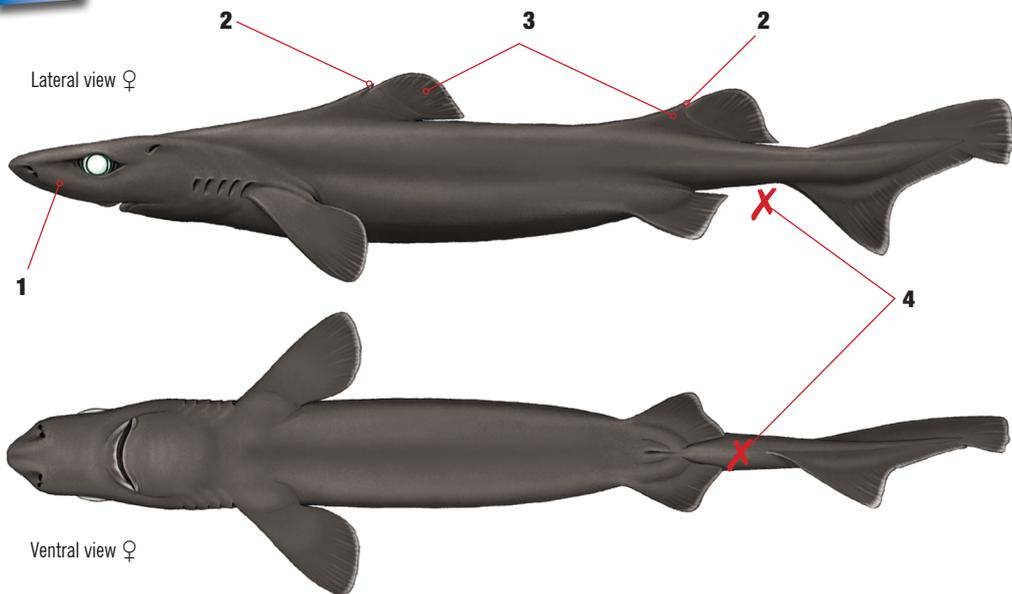
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# Longnose Velvet Dogfish *Centroselachus crepidater*



Lateral view ♀

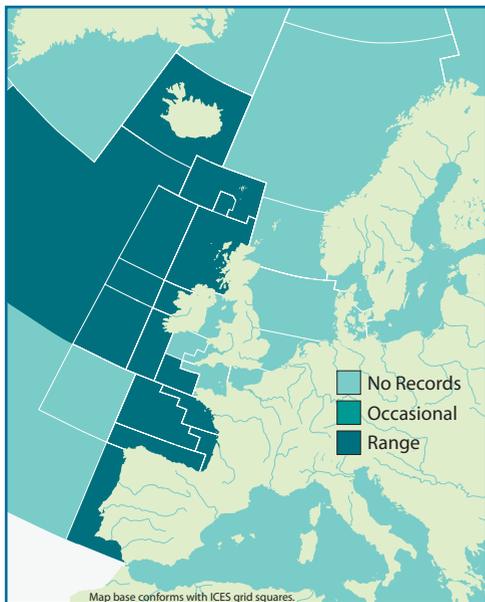
Ventral view ♀

## SCIENTIFIC NAME

*Centroselachus crepidater* (Bocage & Capello, 1864).

## DISTRIBUTION

Patchy worldwide distribution. East Atlantic from Iceland to Madeira and Gabon to Namibia<sup>i</sup>.



## COMMON NAME

**LONGNOSE VELVET DOGFISH**, Deepwater Dogfish, Golden Dogfish, Roughskin Dogfish, Pailona à Long Nez (Fr), Sapata Negra (Es).

## IDENTIFICATION

- 1 Tiny dorsal spines.
- 2 Tiny dorsal spines.
- 3 Squared dorsal fins with expanded bases.
- 4 No anal fin<sup>i</sup>.

## COLOUR

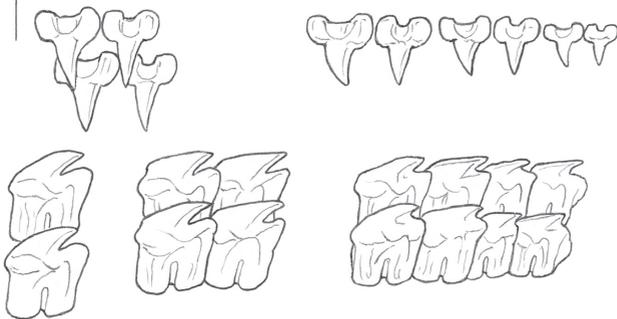
- Uniform black or brownish.
- No pattern or markings<sup>i</sup>.

## BIOLOGY AND SIZE

- Born: 30-35cm<sup>i</sup>. Mature: 82cm ♂, 64cm ♀<sup>v</sup>. Max TL: 135cm<sup>iv</sup>.
- Feeds equally on fish and cephalopods, with a small amount of decapod crustaceans<sup>iii</sup>.
- 3-9 pups per litter, although gestation period and size at birth are unknown<sup>v</sup>.



## TEETH



- Uppers lanceolate.
- Lovers bladelike with long, oblique cusps<sup>1</sup>.

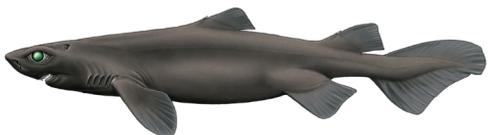
## SIMILAR SPECIES



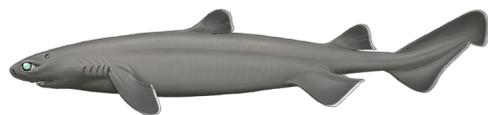
- *Centroselachus crepidater*, Longnose Velvet Dogfish



- *Zameus squamulosus*, Velvet Dogfish



- *Scymnodon ringens*, Knifetooth Dogfish



- *Dalatias licha*, Kitefin Shark

## HABITAT

- 270–2,080m.
- Usually deeper than 500m<sup>ii</sup>.
- Feeds both benthically and in the water column<sup>v</sup>.

## CONSERVATION STATUS

- Population data is scarce but the species appears to be relatively abundant. Typical deep water elasmobranch life history traits make it vulnerable however.
- **Red List status:** Least Concern (2003).

## COMMERCIAL IMPORTANCE

- Mainly a bycatch species in trawl and longline fisheries.
- Some targeting for its flesh and liver oil.
- May become more important as other species decline<sup>v</sup>.
- 2010 – Subject to a zero TAC in EU waters.

## HANDLING

- Handle with care.
- Dorsal spines.
- Abrasive skin and sharp teeth.

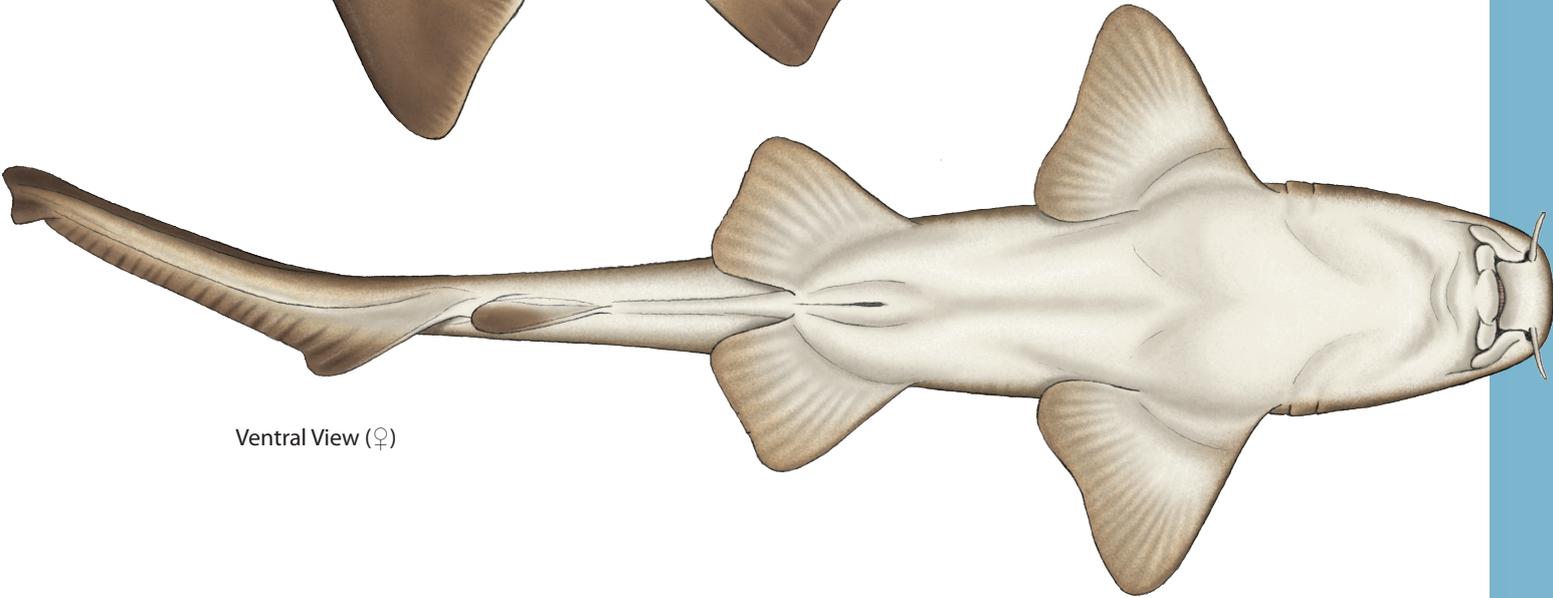
## REFERENCES

- Compagno, L. J. V.; 1984. FAO.
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- Stevens, J.; 2003. IUCN Red List.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Nurse Shark**, Carpet Shark, Requin Nourrice (Fr), Gata Nodriza (Es).

### SYNONYMS

*Squalus cirratus* (Bonnaterre, 1788), *Squalus punctulatus* (Lacépède, 1800), *Squalus cirrhatus* (Bloch & Schneider, 1801), *Ginglymostoma cirratum* (Jordan, 1905), *Squalus punctatus* (Bloch & Schneider, 1801), *Scyllium cirrhosum* (Griffith & Smith), *Ginglymostoma cirrosom* (Müller & Henle, in Bonaparte, 1838), *Squalus argus* (Bancroft, 1832), *Ginglymostoma fulvum* (Poey, 1858), *Ginglymostoma caboverdianus* (Capello, 1867), *Ginglymostoma cirrotum* (Gudger, 1914).

### DISTRIBUTION



The Nurse Shark is found in the temperate and tropical waters of the Pacific and Atlantic Oceans. In the east Atlantic it is known from Senegal to Gabon with a single record from the Gulf of Gascogne, France (Compagno, 2001). In 2001, an unidentified shark encountered by divers near Alderney was claimed to be the Nurse Shark.

### APPEARANCE

- Mouth near tip of snout with a barbel each side.
- Very small eyes.
- Dorsal fins and anal fin broadly rounded.
- Second dorsal fin nearly as large as first.
- First dorsal fin originates over or behind pelvic fin origins.
- No distinct ventral caudal lobe.
- Light yellow to dark brown in colour.
- Juveniles <60cm TL have small dark spots surrounded by lighter areas.
- Juveniles 70-120cm TL are capable of limited colour change.

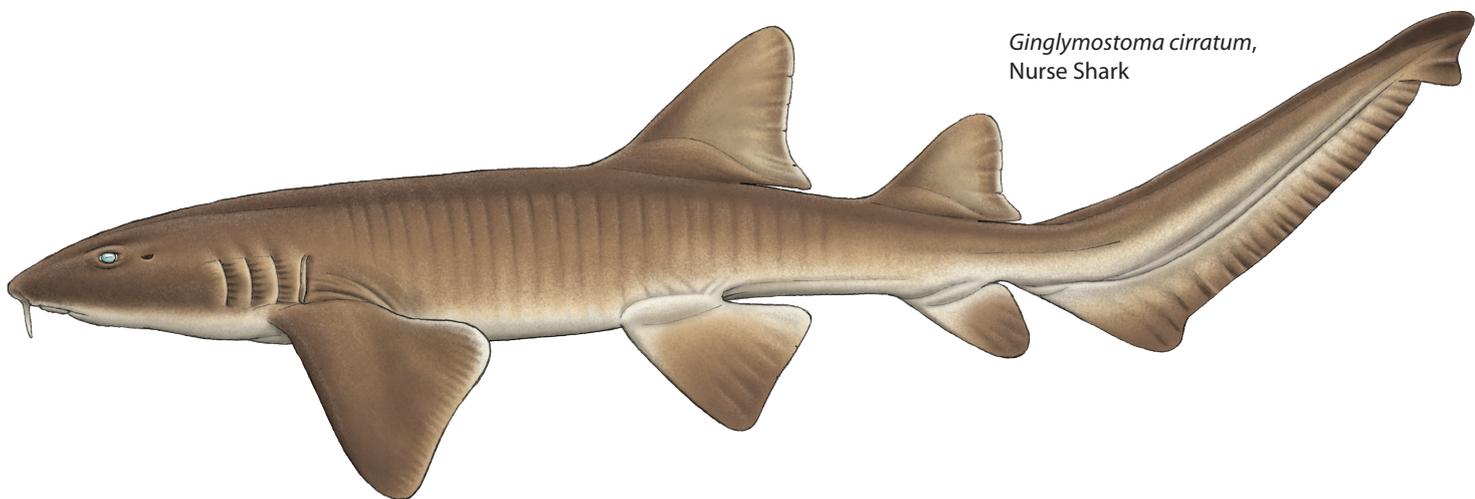
The Nurse Shark is distinctive in the North Atlantic due to its rather dorsoventrally flattened head and nasal barbels. The eyes and spiracles are minute and the mouth is set far forward. It has two large, rounded dorsal fins without spines, the first larger than the second, and broadly rounded pectoral and pelvic fins. The caudal fin is moderately long, more than a quarter of the total length of the shark (Compagno, 2001).

Adults range from uniform light yellow to dark brown in colour. Juveniles may have dark spots surrounded by areas of lighter pigmentation. Juveniles around 70–120cm total length are capable of limited colour changes responding to light. Unusually coloured lighter individuals are reported quite regularly (Guarracino, Unknown).

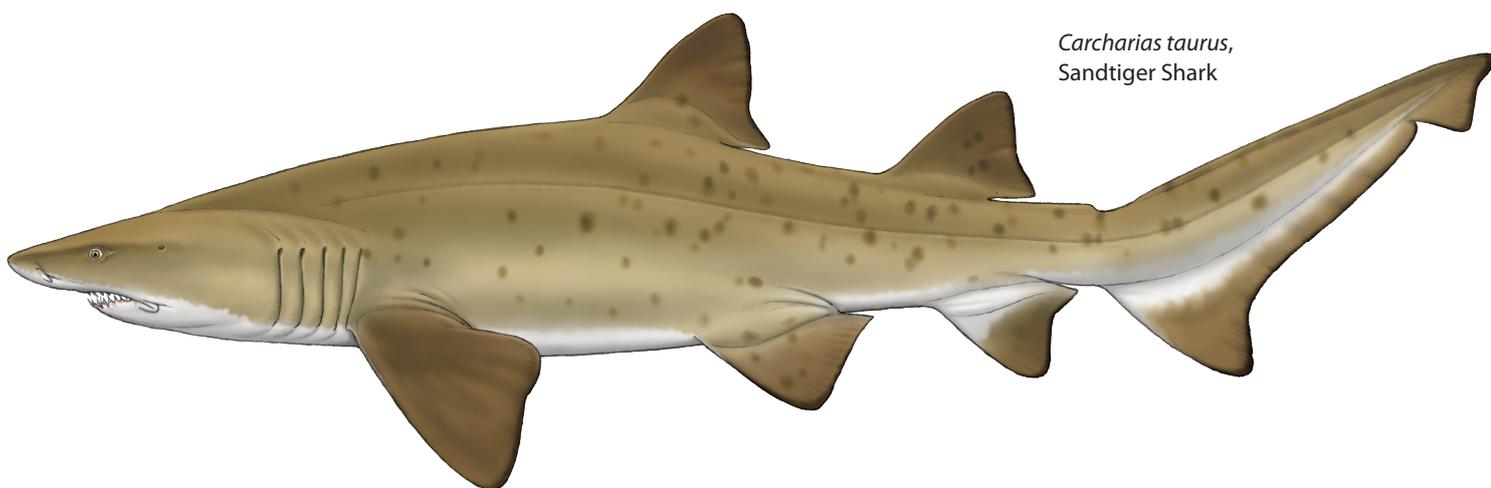
## SIMILAR SPECIES

*Carcharias taurus*, Sandtiger Shark

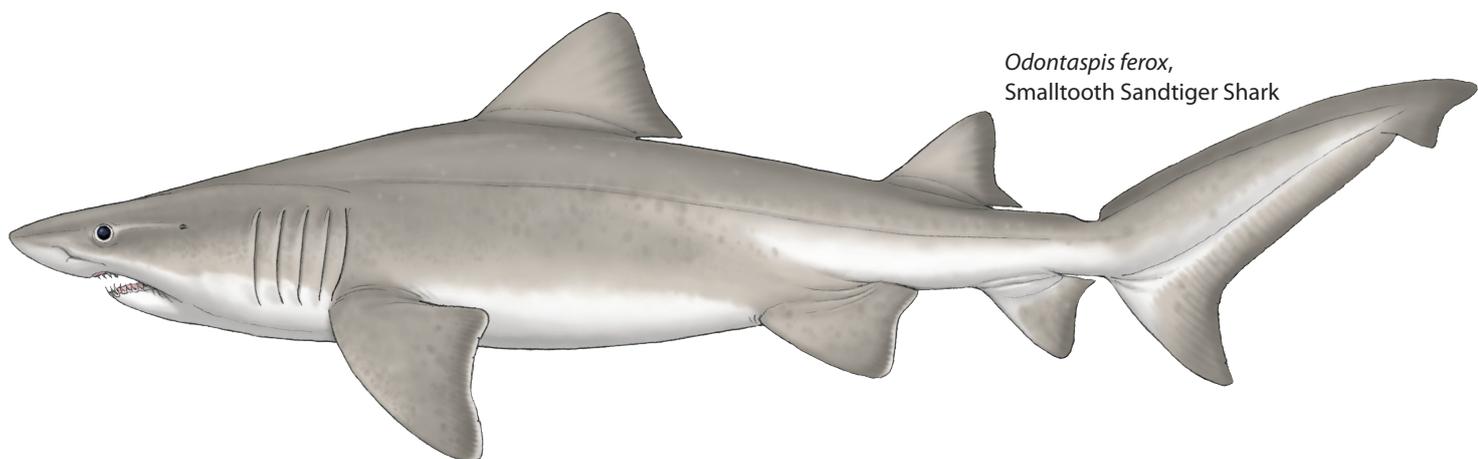
*Odontaspis ferox*, Smalltooth Sandtiger Shark



*Ginglymostoma cirratum*,  
Nurse Shark



*Carcharias taurus*,  
Sandtiger Shark

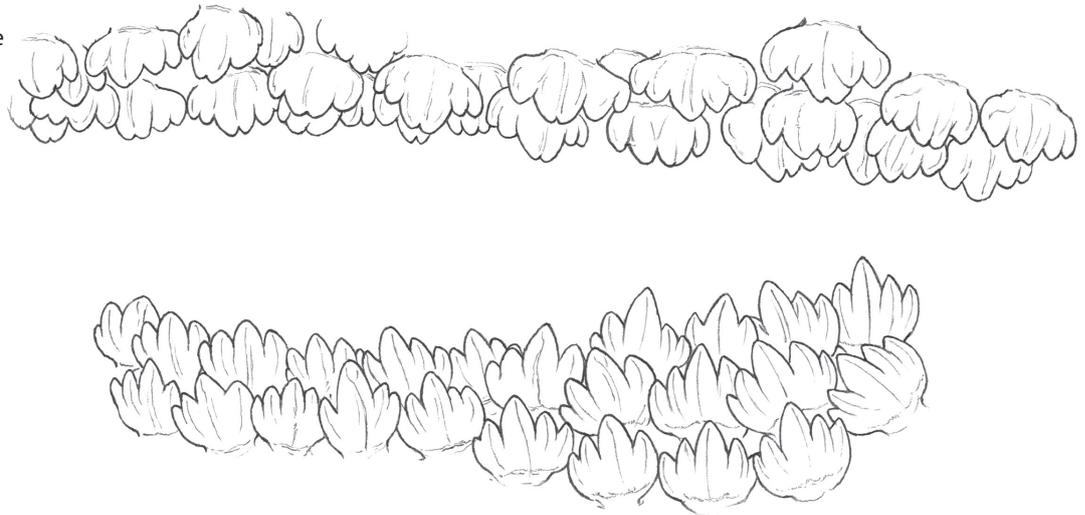


*Odontaspis ferox*,  
Smalltooth Sandtiger Shark

(Not to scale)

### TEETH

The teeth have broad cusps with 2–6 cusplets on either side. They do not overlap as in some species so can be replaced individually. There are 30–42 upper rows and 28–34 lower rows (Compagno, 2001).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Nurse Shark is a predominantly demersal species found from 1–75m on sandy or rocky bottoms, although it has been found to 130m off Brazil (Guarracino, Unknown; Compagno, 2001). It is a nocturnal species and lies very close together during the day in groups of up to 40, even piling on top of each other. It is very active at night moving into shallower waters to feed before returning to deeper water to rest during the day. It shows strong site fidelity and often returns to the same cave or crevice each night. Juveniles up to 170cm are generally found shallower than adults around coral reefs, grass flats or mangroves in 1–4 metres of water (Guarracino, Unknown).

#### REPRODUCTION

Female Nurse Sharks reach sexual maturity at a total length of around 225cm, males at a length of around 210cm. As it mates in well studied areas such as the Florida Keys and Dry Tortugas, its mating behaviour is among the best known of any shark. Males approach resting females and bite them on a pectoral fin. They then attempt to roll the female onto her side so a clasper can be inserted into the female's cloaca. As a large number of males generally attempt to mate with a single female, they often carry numerous scars on their flanks and pectoral fins (Guarracino, Unknown). For a more complete discussion of mating, see Carrier *et al* (1994).

It is an ovoviviparous species with a gestation period of around 6 months. Litters of 20–30 pups are born in the late spring and early summer. It then takes 18 months for the ovaries to produce mature eggs, making reproduction biennial. The pups measure 27–30cm total length (Guarracino, Unknown).

#### DIET

The Nurse Shark feeds predominantly on bottom dwelling invertebrates such as spiny lobsters, shrimps, crabs, sea urchins, squids, octopi, marine snails and bivalves. It is also known to feed on fish such as sea catfish, mullets, puffers and stingrays. Algae is sometimes reported from stomach contents. It is thought to use its small mouth and large, bellow-like pharynx to suck in food items at high speed. Combined with its nocturnal habits, this may allow it to catch active reef fish that would normally be too fast (Compagno, 2001).

Young sharks have been observed resting on their pectoral fins with their snout raised. It is thought that this is to provide a false shelter for crabs which can then easily be consumed. When feeding in aquariums, it has been observed cruising in circles with its barbels touching the floor. When it touches a food item it may overshoot but quickly backs up to suction up the food. It may also cover vertical surfaces in this way (Compagno, 2001).

## COMMERCIAL IMPORTANCE

The Nurse Shark is targeted and taken as bycatch in coastal fisheries using gillnets and longlines. Its meat, fins, liver oil and hides can all be utilised. It is targeted by spear-fishers due to its sedentary and docile nature and is prized in competitions (Gibson *et al.*, 2006).

## THREATS, CONSERVATION, LEGISLATION

Major threats to the Nurse Shark include intentional and accidental capture in coastal fisheries, spear-fishing, capture for the ornamental fish trade, habitat destruction and pollution. It is actively targeted in parts of its range using gillnets and lines for its skin, fins and meat. Gene flow between areas is thought to be limited and localised population declines have been recorded. However, the global status of the species is unknown and it has only limited protection from commercial, artisanal and recreational fisheries (Rosa *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Data Deficient (2008).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

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- COMPAGNO, L. J. V. 2001. Sharks of the World: An Annotated and Illustrated Catalogue of Shark Species Known to Date. Volume 2. Bullhead, Mackerel and Carpet Sharks (Heterodontiformes, Lamniformes and Orectolobiformes). FAO. Rome, Italy.
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Text: Richard Hurst.  
Illustrations: Marc Dando.

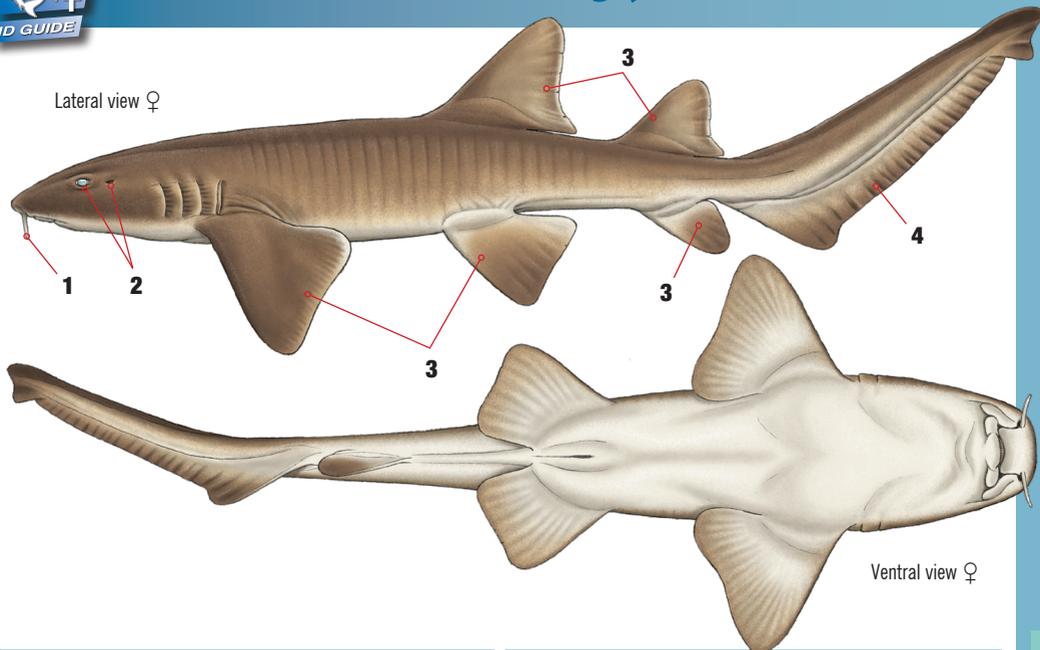
### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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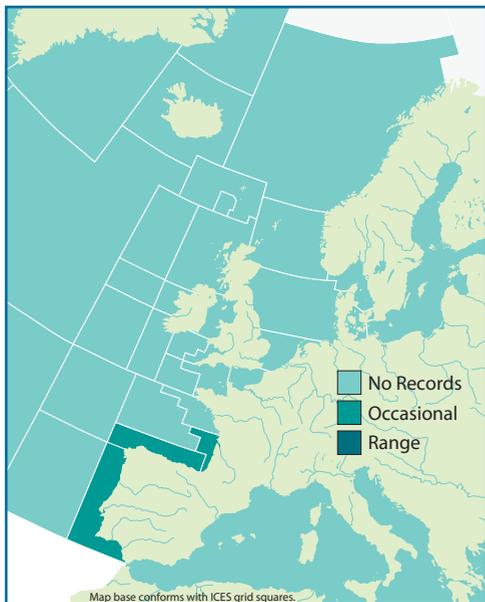


## SCIENTIFIC NAME

*Ginglymostoma cirratum* (Bonnaterre, 1788).

## DISTRIBUTION

Tropical and warm temperate waters of the Atlantic and east Pacific. Patchy in east Atlantic from France to Gabon<sup>1</sup>.



## COMMON NAME

**NURSE SHARK**, Carpet Shark, Requin Nourrice (Fr), Gata Nodriza (Es).

## IDENTIFICATION

- 1 Two nasal barbels reaching below mouth.
- 2 Eyes and spiracles minute.
- 3 Large, rounded precaudal fins.
- 4 Caudal fin longer than  $\frac{1}{4}$  of total length<sup>1</sup>.

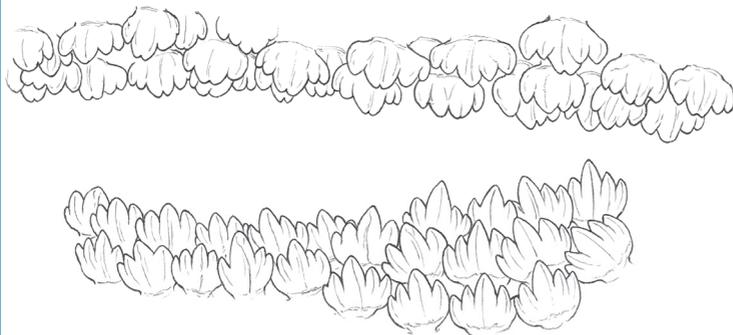
## COLOUR

- Adults uniform light tan to dark brown.
- Small black spots with lighter pigmentation in juveniles (<60cm).
- Juveniles capable of limited colour change in relation to light levels<sup>1</sup>.

## BIOLOGY AND SIZE

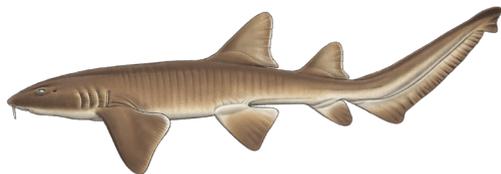
- Born: 27–30cm. Mature: 230–240cm ♀, 210cm ♂, Max TL: 304cm. Possibly to 430cm<sup>1</sup>.
- Biennial reproductive cycle. Gestation period ~6 months and litters normally 20–30 pups<sup>1</sup>.
- Ambush predator feeding predominantly on teleost fish, stingrays, molluscs and crustaceans<sup>1</sup>.

## TEETH

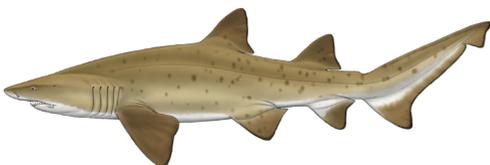


- Broad cusps with 2–6 cusplets on both sides.
- Do not overlap
- 30–42 upper rows, 28–34 lower rows.

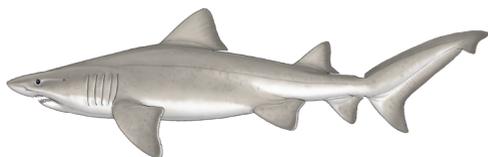
## SIMILAR SPECIES



- *Ginglymostoma cirratum*, Nurse Shark



- *Carcharias taurus*, Sandtiger Shark



- *Odontaspis ferox*, Smalltooth Sandtiger Shark

## HABITAT

- Reefs and rocky areas from 1-12m, reported from 40–130m off Brazil<sup>i</sup>.
- Nocturnal, resting on the seafloor during the day in deeper water. Sometimes rest very closely together in large groups.
- Migrate into shallower water (<20m) during darkness<sup>ii</sup>.

## CONSERVATION STATUS

- Little is known of how populations are connected but preliminary studies indicate little gene flow between groups. Recent evidence of declines and reduction of range<sup>iii</sup>.
- **Red List status:** Data Deficient (2006).

## COMMERCIAL IMPORTANCE

- Targeted with lines and gillnets in some of its range for the flesh and skin.
- Primarily a bycatch species elsewhere, sometimes landed for human consumption but usually discarded.
- Popular aquarium species due to its docile and hardy nature<sup>iii</sup>.

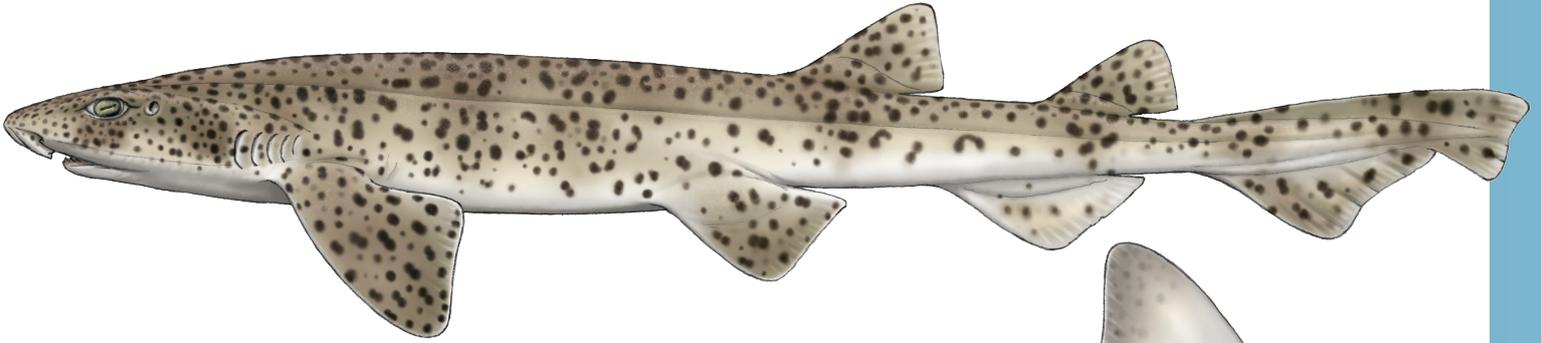
## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

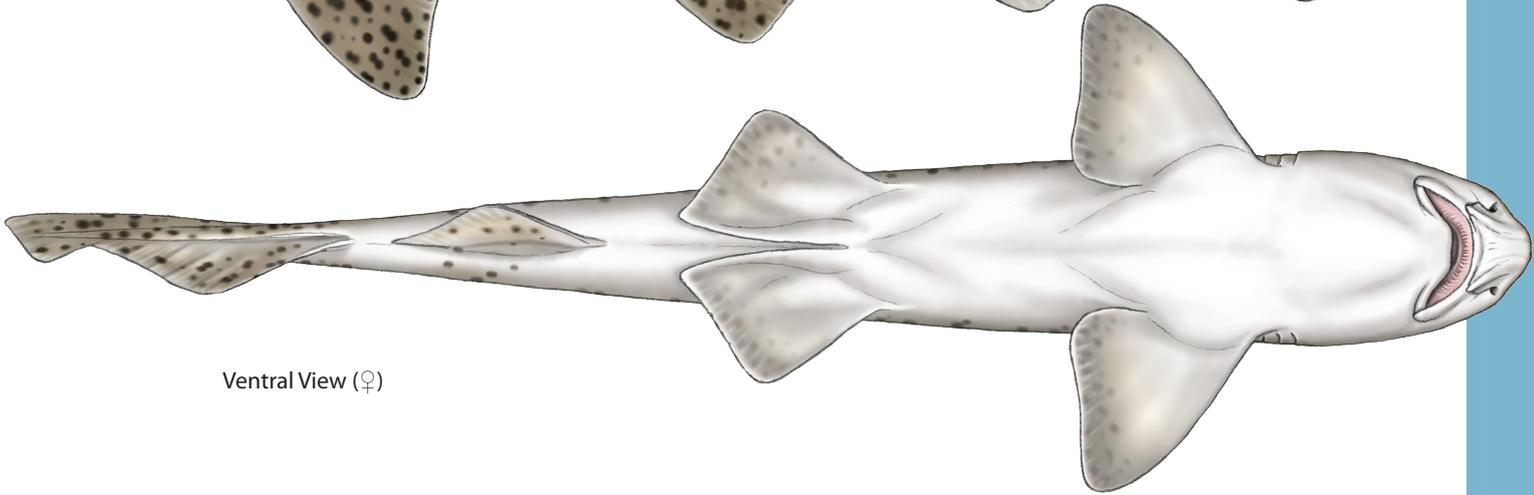
## REFERENCES

- i. Compagno, L. J. V. *et al*; 2005. HarperCollins Publishers.
- ii. Guarracino, M; Unknown. FLMNH.
- iii. Rosa, R. S. *et al*; 2006. IUCN Red List.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Nursehound**, Bull Huss, Greater Spotted Catshark, Greater Spotted Dogfish, Flake, Rigg, Grande Roussette (Fr), Alitán (Es).

### SYNONYMS

*Squalus stellaris* (Linnaeus, 1758), *Scyllium catulus* (Müller & Henle, 1838), *Scyllium acanthonotum* (Filippi and Verany, 1853), *Scyliorhinus besnardi* (Springer & Sadowsky, 1970).

### DISTRIBUTION



The Nursehound is known in the northeast Atlantic from southern Scandinavia and the British Isles to at least Morocco, including the Mediterranean Sea. Its presence in tropical west Africa from Senegal to Zaire is uncertain and may be due to misidentifications of the West African Catshark, *Scyliorhinus cervigoni* (Compagno, 1984).

### APPEARANCE

- Two dorsal fins without spines.
- First dorsal fin larger than second, originates over pelvic fins.
- Second dorsal fin originates over or slightly behind anal fin.
- Almost straight caudal fin with large ventral lobe.
- Nasal furrows **do not** reach mouth.
- 162cm maximum total length. Common to 130cm
- Creamy brown dorsally with numerous dark spots.
- Occasionally also white spots.
- White ventrally.

A large catshark which can reach up to 160cm in length, the Nursehound can be found throughout the northeast Atlantic and Mediterranean. The head is moderately short and broad. On the underside there are no nasoral grooves and labial furrows on the lower jaw only. The small anterior nasal flaps **do not** reach the mouth. The pectoral fins are relatively large. The first dorsal fin is set well back along the body, above the pelvic fins. The second dorsal fin is set above the anal fin. There are no dorsal fin spines. The caudal fin is long and almost straight with a well developed ventral lobe (Compagno, 1984).

Colouration is pale brown dorsally, white ventrally. There is a pattern of numerous large and small dark/black spots and occasionally white spots on the back. It grows to a maximum size of 162cm, although it is more commonly found to a maximum of 130cm (Compagno, 1984).

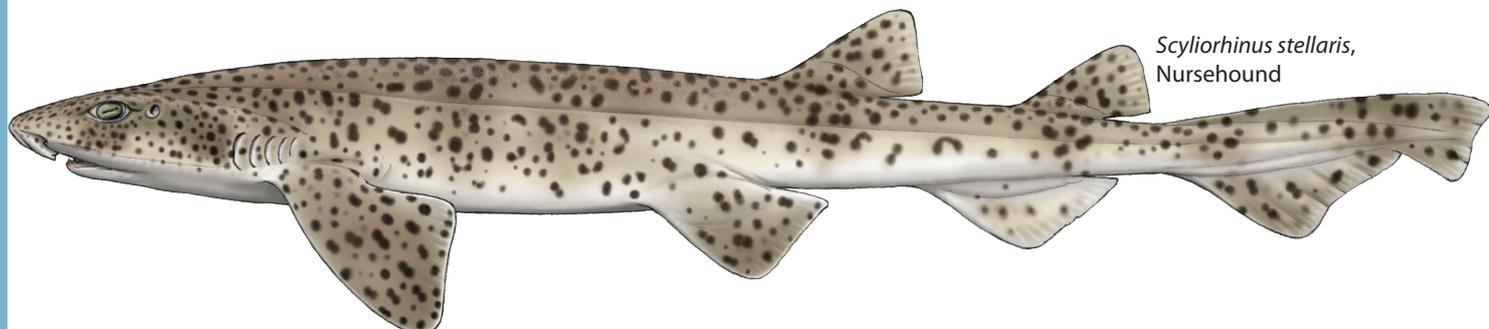
## SIMILAR SPECIES

*Scyliorhinus canicula*, Small Spotted Catshark

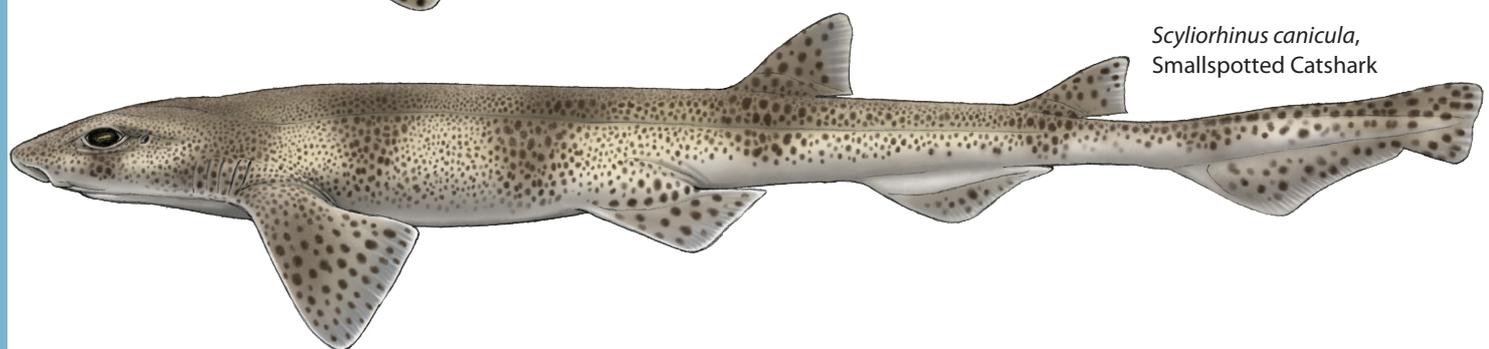
*Galeus melastomus*, Blackmouth Catshark

*Galeus atlanticus*, Atlantic Sawtail Catshark

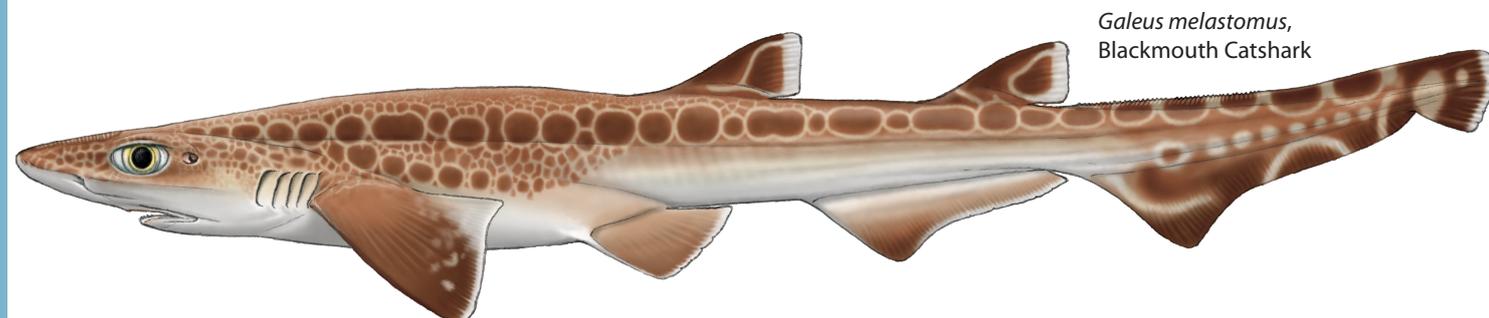
*Galeus murinus*, Mouse Catshark



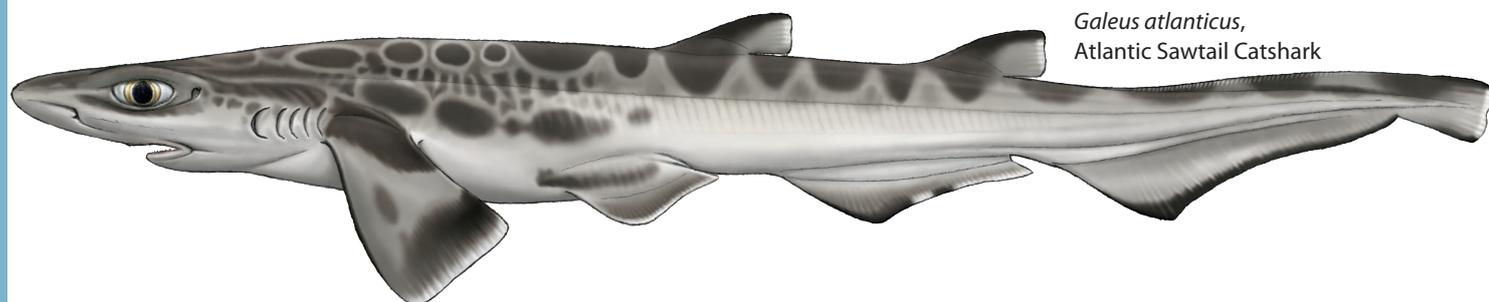
*Scyliorhinus stellaris*,  
Nursehound



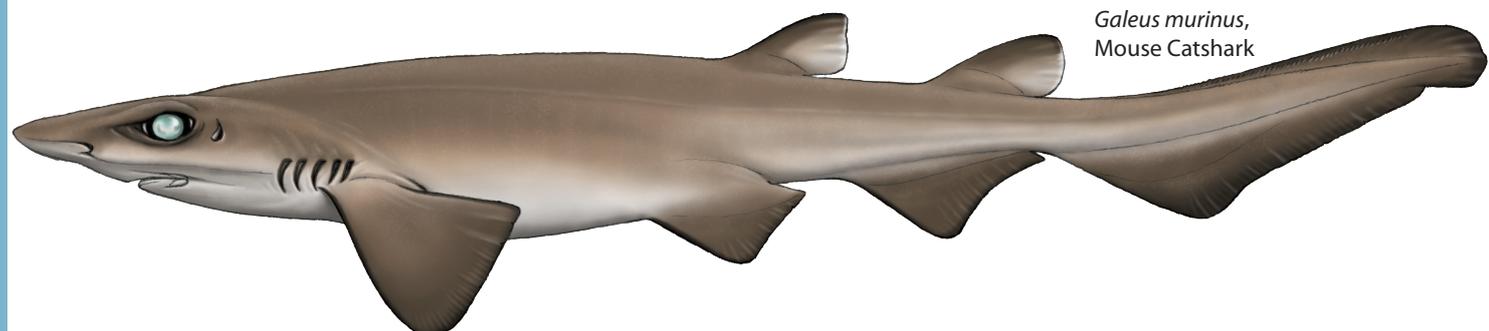
*Scyliorhinus canicula*,  
Smallspotted Catshark



*Galeus melastomus*,  
Blackmouth Catshark



*Galeus atlanticus*,  
Atlantic Sawtail Catshark

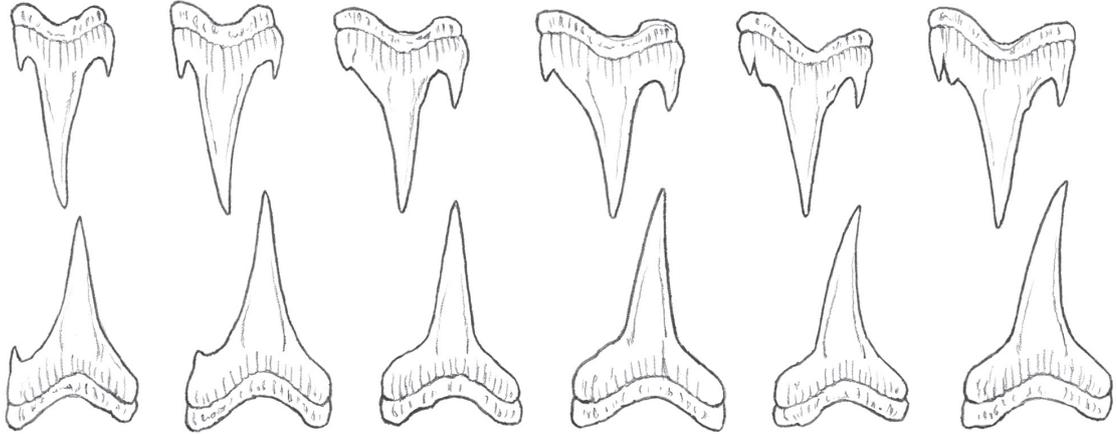


*Galeus murinus*,  
Mouse Catshark

(Not to scale)

### TEETH

There are 44–56 teeth in the upper jaw, including 0–2 symphyseal teeth and 38–46 teeth in the lower jaw, including 2–4 symphyseal teeth. The front teeth are single-cusped and erect, further back in the jaw they develop cusplets (Soldo *et al.*, 2000).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Nursehound can be found to 125m but is most common around 20–63m. It seems to have a preference for rough/rocky ground or areas with good algal cover. It is locally abundant in some places and is regularly encountered by divers, though not as commonly as the Small Spotted Catshark, *Scyliorhinus canicula* (Compagno, 1984).

#### EGGCASE

- 9cm in length (excluding horns).
  - 3cm in width.
  - Long tendrils from each corner (Compagno, 1984).
- Similar eggcase to the Small Spotted Catshark, *Scyliorhinus canicula*.

#### DIET

The Nursehound feeds on a wide variety of prey but crustaceans dominate, particularly hermit crabs, swimming crabs, cancrivora crabs and large shrimp. It also feeds on molluscs such as squid and octopi and a number of bony fish including mackerel, epigonids, dragonets, gurnards, flatfish, herring, and small codfish. It is also known to feed on the closely related Small Spotted Catshark, *Scyliorhinus canicula* (Compagno, 1984).

#### REPRODUCTION

Relatively little is known of the reproductive biology of the Nursehound except that it is an oviparous species with an incubation period of between 9 and 11 months. Egg laying appears to occur during spring and summer in shallow water. It is thought that the Fal Estuary in Cornwall is an extensive and important laying area and nursery ground for the species due to the large number of eggcases and animals found there (Orton, 1926). From eggcase surveys, the Llŷn Peninsula in North Wales also appears to be important (Hood and Reeve, pers comm.). The eggs are large, around 9cm long and 3cm wide. Garstang (1894) notes that breeding around Plymouth occurs during November, December and January, although it is unclear if this refers to mating, laying or hatching (Garstang, 1894). The pups emerge measuring around 16cm in length (Compagno, 1984).

## COMMERCIAL IMPORTANCE

The Nursehound is mostly taken as bycatch but is also targeted throughout its range by bottom trawls, gill nets, bottom set longlines, handlines, fixed bottom nets and occasionally pelagic trawls. It is utilised fresh or dried salted for human consumption and can be processed into fishmeal (Gibson *et al.*, 2006).

## THREATS, CONSERVATION, LEGISLATION

Around the British Isles the Nursehound can be locally abundant, particularly around the coasts of Pembrokeshire, Anglesey, the Llŷn Peninsula and Cardigan Bay. However, it may be at risk of localised depletion. It is often fished with bottom trawls, gill nets, bottom set longlines, handlines, fixed bottom nets and even pelagic trawls. Limited data is available on exploitation and abundance trends, although declines have been recorded in the northwest Mediterranean (Gibson *et al.*, 2006).

While little is known of the biology of the Nursehound, it is a late maturing species with low fecundity. Combined with a limited level of interconnectivity between island populations, the species has a low potential level of recovery. It lives entirely within the depth range heavily exploited by near shore fisheries and as such, is likely to have seen significant population declines (Gibson *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Near Threatened (2008).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

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Text: Richard Hurst.  
Illustrations: Marc Dando.

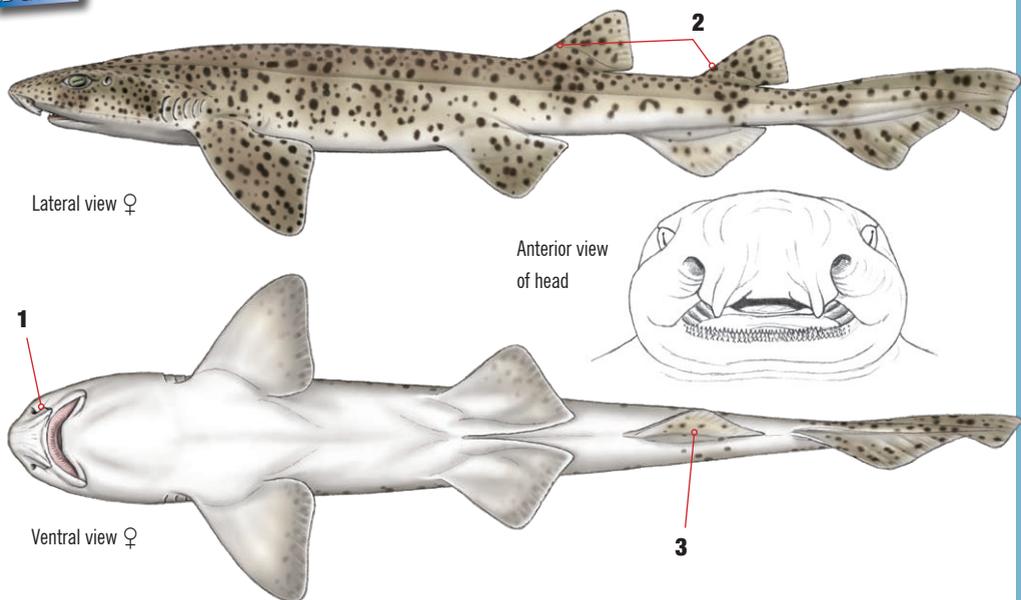
### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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Lateral view ♀

Anterior view of head

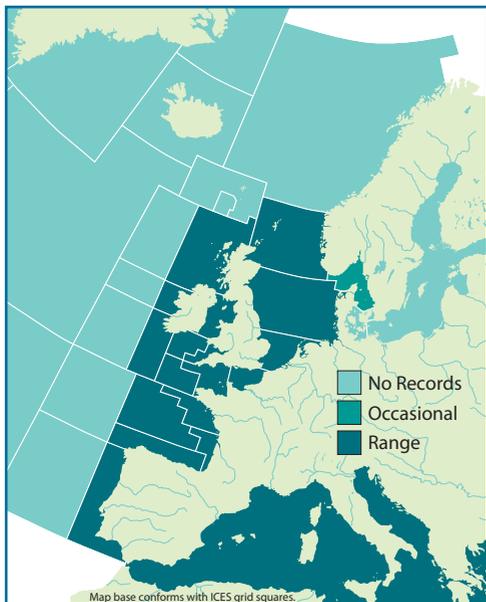
Ventral view ♀

## SCIENTIFIC NAME

*Scyliorhinus stellaris* (Linnaeus, 1758).

## DISTRIBUTION

Northeast Atlantic from southern Scandinavia and the British Isles to Morocco, including the Mediterranean Sea. Possibly tropical west Africa.



## COMMON NAME

**NURSEHOUND**, Bull Huss, Greaterspotted Catshark, Greater Spotted Dogfish, Flake, Rigg, Grande Roussette (Fr), Alitán (Es).

## IDENTIFICATION

- 1 Nasal furrows do not reach mouth.
- 2 No dorsal spines.
- 3 Anal fin present.

## COLOUR

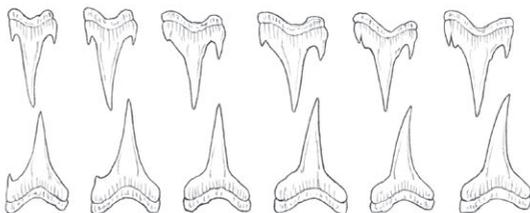
- Creamy brown dorsally.
- Numerous large and small dark spots.
- Sometimes white spots.
- White ventrally<sup>1</sup>.

## BIOLOGY AND SIZE

- Born: 16cm. Max TL: 162cm<sup>1</sup>.
- Oviparous, incubation periods of 9–11 months have been recorded<sup>iii</sup>.
- Cephalopods dominate diet. Crustaceans, molluscs and fish are also important<sup>1</sup>.

## TEETH

- 44–56 teeth in the upper jaw including 0–2 symphyseal teeth.
- 38–46 teeth in the lower jaw including 2–4 symphyseal teeth.
- Front teeth single cusped and erect.
- Develop cusplets further back in the jaw<sup>iv</sup>.



## SIMILAR SPECIES



- Scyliorhinus stellaris*, **Nursehound**



- Scyliorhinus canicula*, **Smallspotted Catshark**



- Galeus melastomus*, **Blackmouth Catshark**



- Galeus murinus*, **Mouse Catshark**



- Galeus atlanticus*, **Atlantic Sawtail Catshark**

## HABITAT

- From intertidal to 12m, most common 20–63m.
- Has a preference for rough/rocky areas or areas with heavy algal cover<sup>i</sup>.
- Can be locally abundant, although not to the same extent as Smallspotted Catshark, *Scyliorhinus canicula*<sup>ii</sup>.

## CONSERVATION STATUS

- While it can be locally abundant, limited interconnectivity between populations and relatively low fecundity may make it vulnerable to overexploitation. Declines have been recorded in the northern Mediterranean<sup>iii</sup>.
- Red List status:** Near Threatened (2008).

## COMMERCIAL IMPORTANCE

- Bycatch species in the Atlantic in bottom trawls, gill nets, bottom set long lines, handlines, fixed bottom nets and occasionally pelagic trawls.
- Targeted in the Mediterranean Sea where its flesh is utilised for human consumption.
- Usually discarded in northern Europe, although post discard survival rates may be high<sup>iv</sup>.

## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## EGGCASE

- 90mm long (excluding horns).
- 30m wide.
- Long tendrils from each corner<sup>i</sup>.
- Similar eggcase to the Smallspotted Catshark, *Scyliorhinus canicula*.

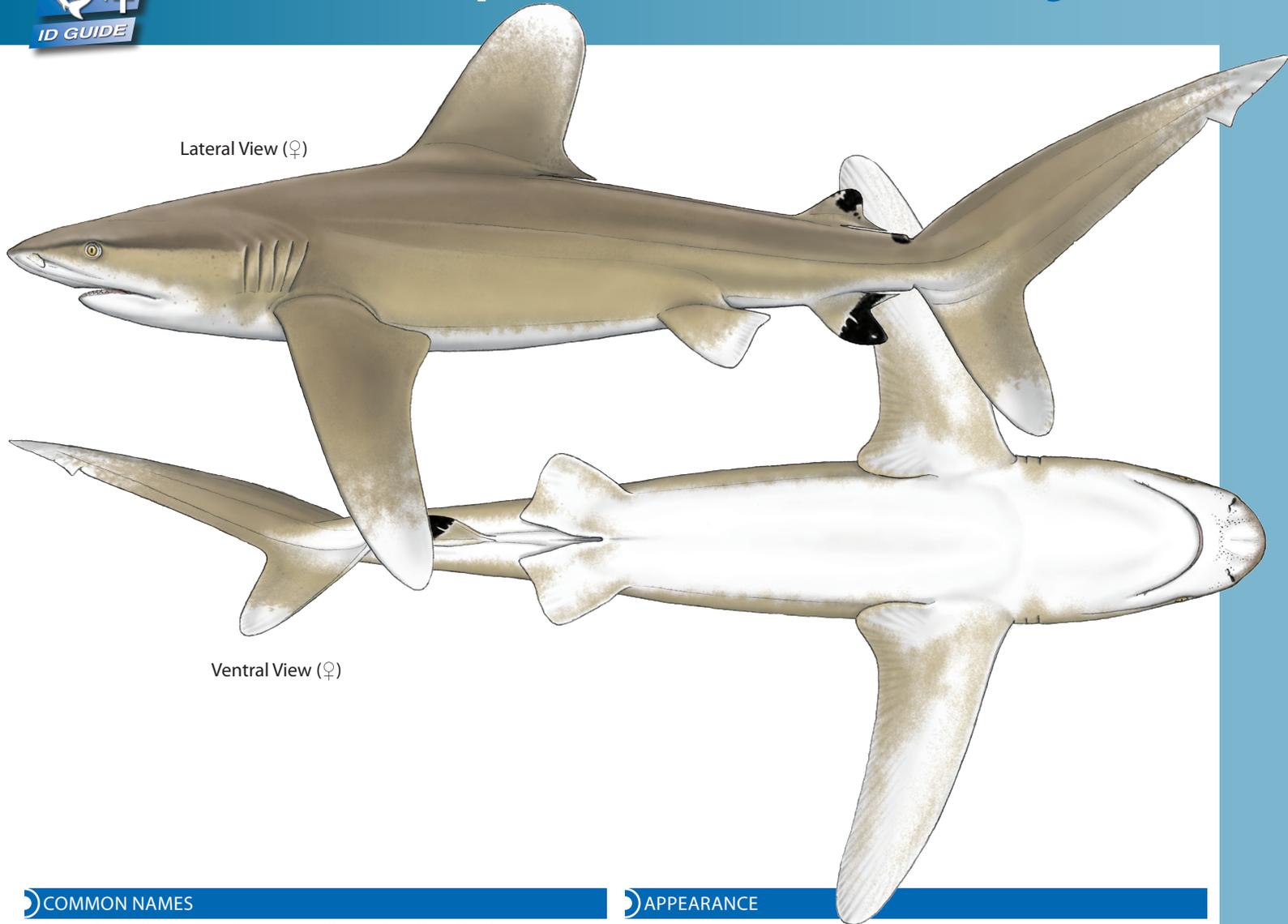
## REFERENCES

- Compagno, L. J. V.; 1984. *FAO*.
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Lateral View (♀)

Ventral View (♀)



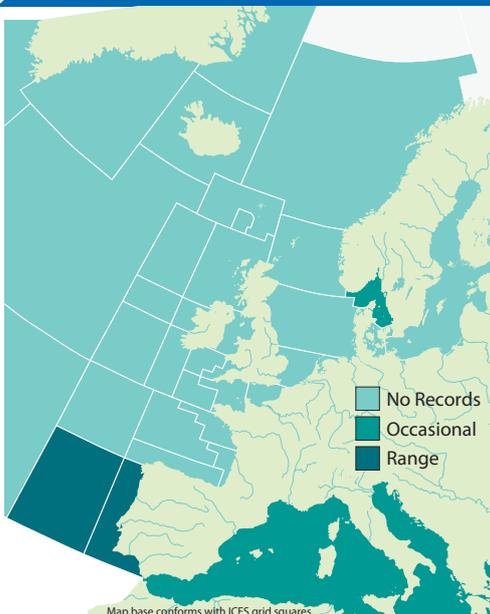
## COMMON NAMES

**Oceanic Whitetip Shark**, Brown Milbert's Sandbar Shark, Brown Shark, Nigano Shark, Whitetip Whaler, Requin Océanique (Fr), Tiburón Oceanico (Es).

## SYNONYMS

*Squalus longimanus* (Poey, 1861), *Squalus (Carcharias) maou* (Lesson, 1830), *Carcharias (Prionodon) obtusus* (Garman, 1881), *Carcharias insularum* (Snyder, 1904), *Pterolamiops magnipinnis* (Smith, 1958), *Pterolamiops budkeri* (Fourmanoir, 1961).

## DISTRIBUTION



The Oceanic Whitetip Shark is widespread in tropical, subtropical and temperate waters worldwide. It is known in the east Atlantic from Portugal to the Gulf of Guinea but is absent from the Mediterranean (Compagno, 1984). There is a single record of a vagrant from Sweden (Stenberg, 2004).

## APPEARANCE

- Stocky build. Short, blunt snout.
- Long, broad, paddle-shaped fins.
- High first dorsal fin.
- White tips on the pectoral, pelvic, first dorsal and caudal fins.
- Dark patches and spots on all fins, particularly the second dorsal and anal fins.

The Oceanic Whitetip Shark is an easily distinguishable species due to its stocky build, large size and distinct colouration. The snout is blunt and broadly rounded with small eyes. The first dorsal fin is large and broadly rounded, originating just in front of the pectoral fin free rear tips. The pectoral fins are paddle-shaped, long and broad. The small second dorsal fin originates over or just in front of the anal fin. The caudal fin is large and heterocercal (Compagno, 1984).

The most distinctive feature of the species is the white tip to the first dorsal, pectoral, pelvic and caudal fins. White mottling on the fins or black markings in young individuals may be present. There may also be dark saddle-shaped markings between the dorsal fins. The body is greyish bronze to brown in colour, varying with location. The underside is white to pale yellow (Bester, Unknown).



## SIMILAR SPECIES

*Carcharhinus brachyurus*, Copper Shark

*Carcharhinus falciformis*, Silky Shark

*Carcharhinus plumbeus*, Sandbar Shark

*Galeocerdo cuvier*, Tiger Shark

*Carcharhinus longimanus*,  
Oceanic Whitetip Shark

*Carcharhinus brachyurus*,  
Copper Shark

*Carcharhinus falciformis*,  
Silky Shark

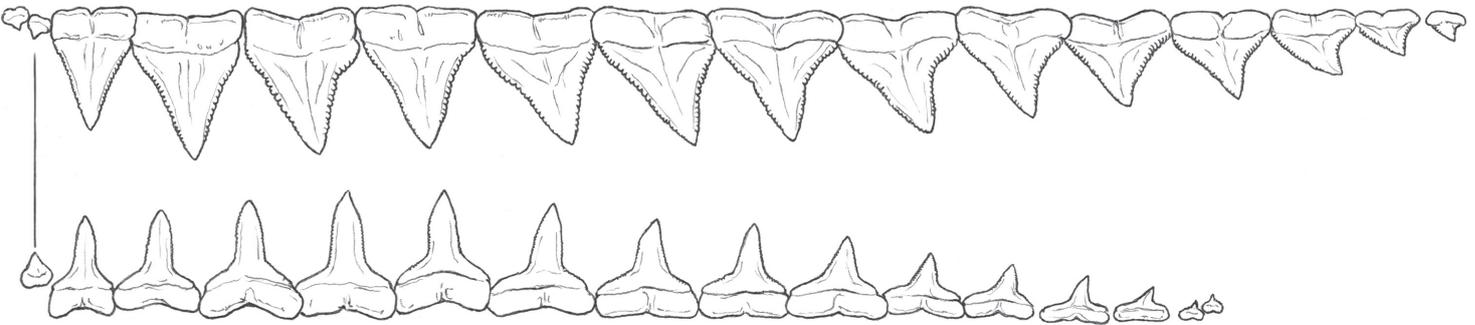
*Carcharhinus plumbeus*,  
Sandbar Shark

*Galeocerdo cuvier*,  
Tiger Shark

(Not to scale)

## TEETH

Broad, triangular, serrated teeth in the upper jaw. Teeth in the lower jaw are pointed and only serrated near the tip. 28–30 uppers, 26–30 lowers (Bester, Unknown).



## ECOLOGY AND BIOLOGY

### HABITAT

The Oceanic Whitetip Shark is found well offshore from the surface to 152m although it has been reported from shallow waters near shore, usually near oceanic islands. Longline studies show an increase in the abundance of this species further from land. It prefers waters above 21°C. Often solitary although it has been observed forming large groups when abundant food is present and is extremely persistent in investigating potential food sources (Bester, Unknown).

There have been reports of the Oceanic Whitetip Shark travelling with pods of female pilot whales. The exact nature of the relationship is unknown but it is believed that the sharks follow the whales to food such as squid, on which they both feed. There is a report of a shark becoming highly agitated and behaving strangely when separated from a pod (Stafford-Deitsch, 1987).

### DIET

An opportunistic predator, the Oceanic Whitetip Shark feeds primarily on pelagic bony fishes and cephalopods such as lancetfish, oarfish, threadfins, barracuda, jacks, dolphinfish, tuna, skipjack and other scombrids, marlin, squid, stingrays, sea birds, turtles, marine gastropods, crustaceans, carrion and garbage (Compagno, 1984).

### REPRODUCTION

Male Oceanic Whitetip Sharks mature at a total length of 175–198cm, females slightly larger at 180–200cm (Compagno, 1984). It is a viviparous species utilising a yolk-sac placenta to nourish the embryos. The gestation period is 9–12 months depending on location. Litters of 1–14 pups have been recorded with the size at birth around 55–75cm total length, although this too appears to depend on location (Bonfil *et al.*, 2008).

### EGGCASE

N/A

## COMMERCIAL IMPORTANCE

The Oceanic Whitetip Shark is taken in large numbers in pelagic fisheries across its range, predominantly on longlines but also with gillnets, handlines and trawls. Its large fins are highly prized for sharkfin soup but the carcass is usually discarded to make room for more valuable species. If landed whole, the meat can be used fresh or preserved for human consumption, the liver can be rendered for vitamin rich oil and the hide can be used for leather (Baum *et al.*, 2006).

## THREATS, CONSERVATION, LEGISLATION

Subject to fishing pressure throughout its range, the Oceanic Whitetip Shark is taken as bycatch on pelagic longlines, gillnets, handlines and occasionally trawls. As in most pelagic fisheries, catches are inadequately monitored due to species confusion and discards after finning. Its large fins are highly prized but the carcass is often discarded. Fisheries pressure on this species is likely to persist or even increase in the future (Baum *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Vulnerable (2006).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

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Text: Richard Hurst.  
Illustrations: Marc Dando.

### Citation

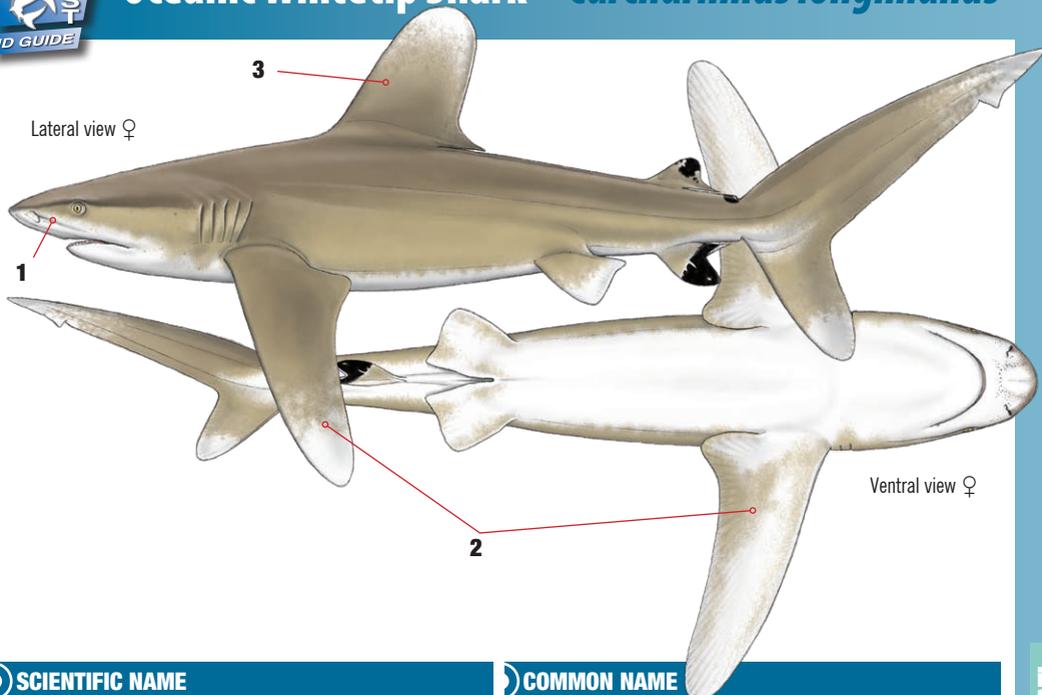
Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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# Oceanic Whitetip Shark *Carcharhinus longimanus*

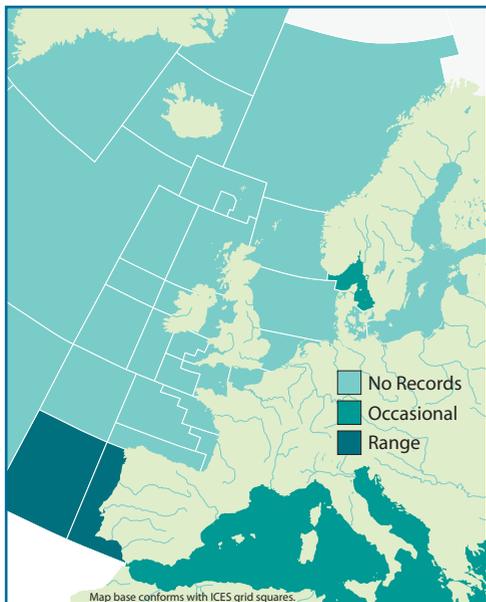


## SCIENTIFIC NAME

*Carcharhinus longimanus* (Poey, 1861).

## DISTRIBUTION

Worldwide in tropical and warm temperate waters. East Atlantic from Portugal to the Gulf of Guinea, possibly including the Mediterranean Sea<sup>iii</sup>. Single record from Sweden.



## COMMON NAME

**OCEANIC WHITETIP SHARK**, Brown Milbert's Sandbar Shark, Brown Shark, Nigano Shark, Whitetip Whaler, Requin Océanique (Fr), Tiburón Oceanico (Es).

## IDENTIFICATION

- 1 Stocky with short, blunt snout.
- 2 Long, broad, paddle shaped pectoral fins.
- 3 High first dorsal fin with rounded tip<sup>iii</sup>.

## COLOUR

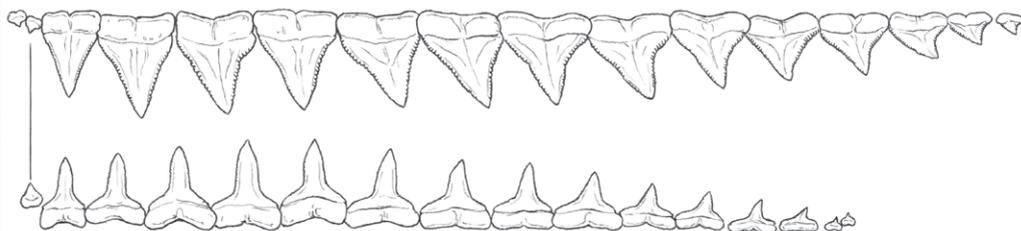
- First dorsal, pectoral, pelvic and caudal fins with obvious white tips.
- Grey bronze to brown dorsally.
- White with yellow tint ventrally<sup>ii</sup>.

## BIOLOGY AND SIZE

- Born: 60–65cm. Mature: ~180–200cm ♀, 175–198cm ♂. Max TL: 350–395cm<sup>i</sup>.
- Gestation period ~12 months, litters of 1–15 have been recorded.
- Feeds primarily on pelagic teleost fish and cephalopods, although sea birds, turtles and cetacean carrion have all been recorded.
- As with other pelagic sharks, can be very persistent in investigating potential food<sup>iii</sup>.



## TEETH



- Broad, triangular, serrated teeth in upper jaw.
- Teeth in lower jaw pointed and only serrated near the tip.
- 28–30 in upper jaw, 26–30 in lower jaw<sup>ii</sup>.

## SIMILAR SPECIES



• *Carcharhinus longimanus*,  
Oceanic Whitetip Shark



• *Carcharhinus plumbeus*,  
Sandbar Shark



• *Carcharhinus falciformis*,  
Silky Shark



• *Carcharhinus brachyurus*,  
Copper Shark



• *Galeocerdo cuvier*,  
Tiger Shark

## HABITAT

- Pelagic, from the surface to more than 200m.
- Can tolerate waters from 15°C–28°C, prefers waters >20°C<sup>i</sup>.
- Often associated with pods of female pilot whales which it may use to locate prey<sup>iv</sup>.

## CONSERVATION STATUS

- Little catch data available but taken in large numbers everywhere it occurs. Once considered a pest to fisheries in some areas, it is now rarely encountered<sup>i</sup>.
- **Red List status:** Vulnerable (2006).

## COMMERCIAL IMPORTANCE

- Taken as bycatch in pelagic longline and trawl fisheries.
- Fins valuable for shark fin soup. Meat, skin and liver also utilised.
- Considered a pest by tuna fishermen as it is known to damage tuna on longlines<sup>ii</sup>.

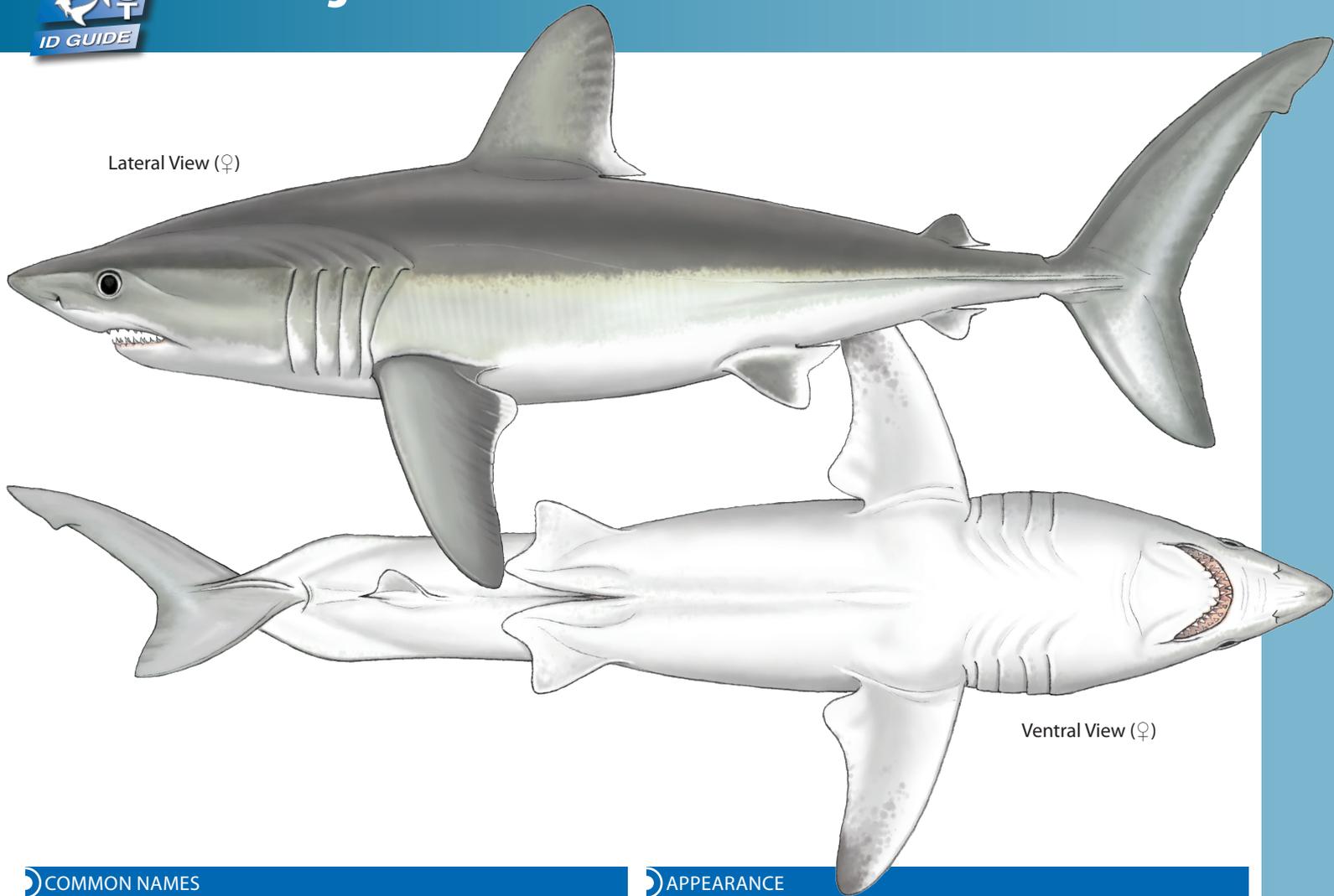
## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

- i. Baum, J. *et al*; 2006. IUCN Red List.
- ii. Bester, C; Unknown. FLMNH.
- iii. Compagno, L. J. V.; 1984. FAO.
- iv. Stafford-Deitsch, J; 1987. HEADLINE Book Publishing Ltd.

Lateral View (♀)



Ventral View (♀)

### COMMON NAMES

**Porbeagle Shark**, Atlantic Mackerel Shark, Blue Dog, Bottle-nosed Shark, Beaumaris Shark, Requin-Taupé Commun (Fr), Marrajo Sardinero (Es), Tiburón Sardinero (Es), Tintorera (Es).

### SYNONYMS

*Squalus glaucus* (Gunnerus, 1758), *Squalus cornubicus* (Gmelin, 1789), *Squalus pennanti* (Walbaum, 1792), *Lamna pennanti* (Desvaux, 1851), *Squalus monensis* (Shaw, 1804), *Squalus cornubiensis* (Pennant, 1812), *Squalus selanonus* (Walker, 1818), *Selanonius walkeri* (Fleming, 1828), *Lamna punctata* (Storer, 1839), *Oxyrhina daekyi* (Gill, 1862), *Lamna philippi* (Perez Canto, 1886), *Lamna whitleyi* (Phillipps, 1935).

### DISTRIBUTION



In the northern hemisphere, the Porbeagle Shark occurs only in the North Atlantic and Mediterranean, whilst in the southern hemisphere it is found in a circumglobal band (Francis *et al.*, 2008).

### APPEARANCE

- Heavily built but streamlined mackerel shark.
- Moderately long conical snout with a relatively large eyes.
- Large first dorsal fin with a conspicuous white free rear tip.
- Second dorsal fin and anal fin equal-sized and set together.
- Lunate caudal fin with strong keel and small secondary keel.
- Dorsally dark blue to grey with no patterning.
- Ventrally white.
- Maximum length of 365cm, though rarely to this size.

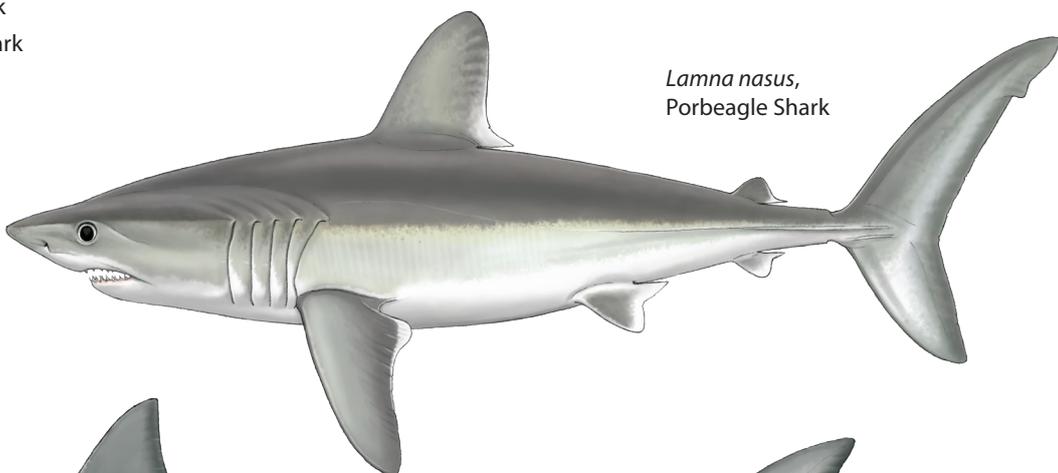
The Porbeagle Shark is a large, streamlined mackerel shark with a conical snout and powerful body. The first dorsal fin is large and originates above or slightly behind the pectoral fins. It has a free rear tip which is white. The second dorsal fin is tiny and is set above the anal fin, to which it is comparable in size. The caudal fin is strong and lunate with a small terminal notch. The caudal keel is strong and, uniquely for the northeast Atlantic, a smaller secondary caudal keel is present. Dorsally, it is dark blue to grey with no patterning. Ventrally it is white with darker patterning on the edges of the pectoral fins. The maximum recorded length is 365cm but animals less than 300cm in length are much more commonly encountered (Compagno, 2001).

In European waters it can be confused with the White Shark, *Carcharodon carcharias*, the Shortfin Mako Shark, *Isurus oxyrinchus*, the Longfin Mako Shark, *Isurus paucus*, and the Blue Shark, *Prionace glauca*. However, it is distinguished from all of these species by its white free rear tip on the first dorsal fin and the secondary caudal keel.

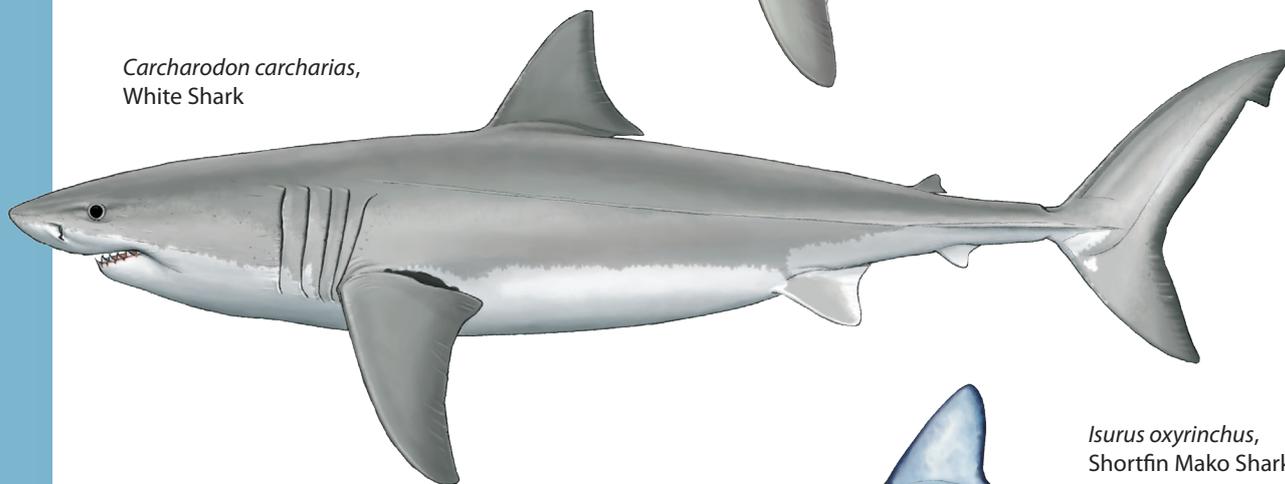
## SIMILAR SPECIES

- Carcharodon carcharias*, White Shark
- Isurus oxyrinchus*, Shortfin Mako Shark
- Isurus paucus*, Longfin Mako Shark
- Prionace glauca*, Blue Shark

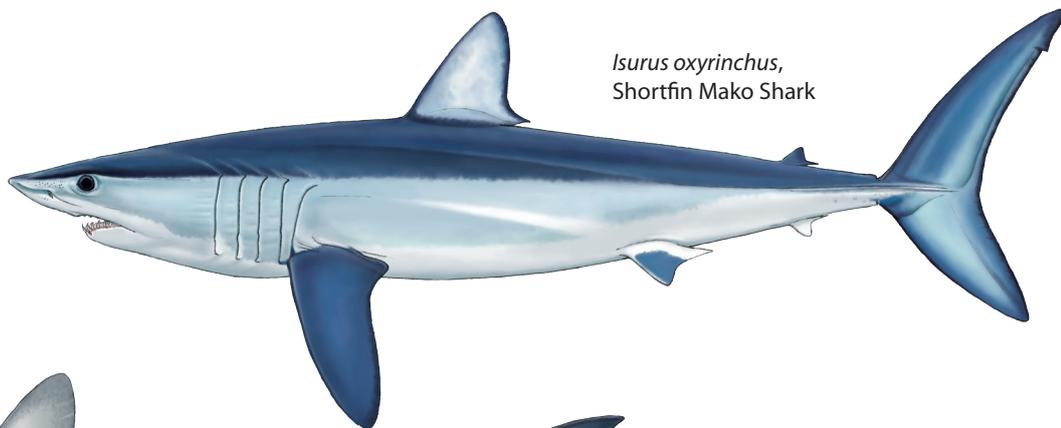
*Lamna nasus*,  
Porbeagle Shark



*Carcharodon carcharias*,  
White Shark



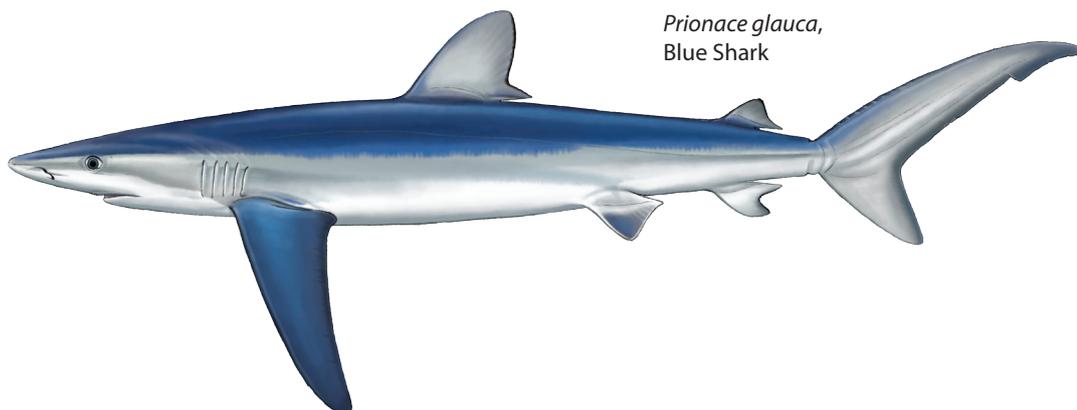
*Isurus oxyrinchus*,  
Shortfin Mako Shark



*Isurus paucus*,  
Longfin Mako Shark



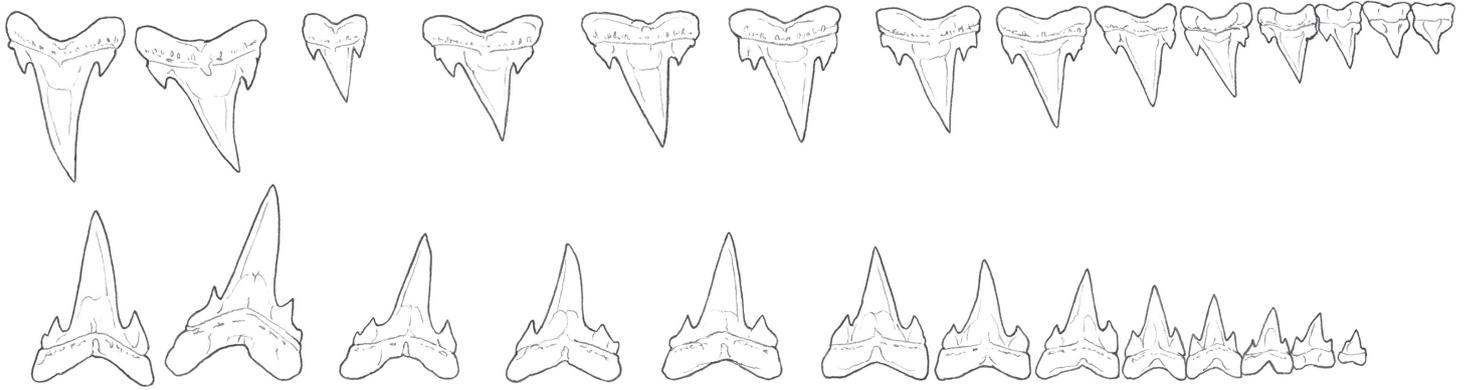
*Prionace glauca*,  
Blue Shark



(Not to scale)

### TEETH

The teeth are moderately large and blade-like with lateral cusps. The first upper lateral teeth have nearly straight cusps (Roman, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Porbeagle Shark can be found from the surface to 715m in coastal and pelagic waters (Roman, Unknown). Tagging studies have revealed a preference for shelf waters, although one tagged individual travelled 1,800km into the mid-Atlantic. There is only one record of a tagged shark crossing the Atlantic from Ireland to Canada and it appears that the two populations are separate (Francis *et al.*, 2008). While it does not appear to enter freshwater, catches from a brackish estuary in Argentina have been reported (Roman, Unknown).

In the southern hemisphere it may move further north, out of its usual range, during the cooler months but is not found further north than 35°S during the summer. Around Australia it may move into subtropical waters during the winter. It appears to be limited to waters between 1–23°C, with abundance declining above 19°C (Francis *et al.*, 2008).

In the North Atlantic, temperatures of -1–15°C have been recorded with a mean of 7–8°C. Its abundance is also governed by seasonal variations with records of Porbeagles moving north along the coast of North America during the spring and early summer with the return migration in late autumn (Francis *et al.*, 2008).

The Porbeagle Shark appears to segregate by sex and size. In Spanish waters, males dominate catches over females in a ratio of 2:1, while 30% more females than males are caught off Scotland. In the Bristol Channel, smaller individuals are found with a dominance of males over females (Francis *et al.*, 2008). This segregation is likely to have evolved as a mechanism of reducing predation of neonates by adults and also to limit breeding to appropriate seasons (Roman, Unknown).

#### DIET

The Porbeagle Shark is primarily a piscivore with teleost fish constituting 90% of the diet of some individuals. It has been reported that pelagic fish are preferred during the spring and summer when abundant. During the autumn and winter, groundfish are the dominant prey. (Roman, Unknown). Compagno (2001) lists the most common prey items as mackerels, pilchards and herring, various gadoids including cod, hakes, haddock, cusk, and whiting, and john dories, dogfishes and hound sharks (*Squalus* and *Galeorhinus* spp.), and squids (Compagno, 2001).

#### REPRODUCTION

Species in the family lamnidae are viviparous with embryos nourished either by a continual supply of unfertilized eggs (oophagy) or through feeding on less developed siblings (adelphophagy, known only from the Sandtiger Shark, *Carcharias taurus*) (Martin, 1984). The Porbeagle Shark employs oophagy to supply nutrients to embryos once the original yolk-sac supply has been depleted. Its ovaries are well adapted to this task and may contain up to 200,000 unfertilised eggs, measuring 1.5–5mm in diameter (Lombardi, 1998).

It has been reported from the northwest Atlantic that females mature at 200–219cm and 50% are mature by 208cm. Males mature at 155–177cm with 50% mature by 166cm. In the southern hemisphere off New Zealand, females mature at 170–180cm and males mature at 140–150cm (Francis *et al.*, 2008).

In the North Atlantic mating occurs in autumn and winter and the females give birth during spring and summer after an 8–9 month gestation period. It appears that populations in the southern hemisphere may breed at different times but data is lacking. The females give to birth to a litter of 1–5 pups, although 4 is normal with 2 pups to each uterus. Each of these pups measures 58–67cm long at birth (Francis *et al.*, 2008).

## COMMERCIAL IMPORTANCE

One of the most valuable elasmobranch species to commercial fisheries, the Porbeagle Shark is taken across its range in targeted longline fisheries and its flesh is used for human consumption, its fins for sharkfin soup, its liver oil for vitamins and its carcass can be processed for fishmeal. It is also regularly taken as bycatch, particularly in tuna longline fisheries in the South Pacific but also in trawl, handline and gillnet fisheries. It is an important recreational species on both sides of the North Atlantic (Stevens *et al.*, 2006).

## THREATS, CONSERVATION, LEGISLATION

The Porbeagle Shark has been fished commercially since the early 1800's, principally by Scandinavian fishers, to provide flesh for human consumption, fins for sharkfin soup, liver oil for vitamins and carcass' for fishmeal (Gauld, 1989). Global catches peaked in the 1960's at around 9,000 tons, followed by a rapid decline to 1,300–2,600 tons in the 1990's (Francis *et al.*, 2008). Catches in the North Atlantic have varied wildly during the 20th century, particularly in the case of the Norwegian targeted fishery. In 1926, 279 tons were landed. This increased to 3,884 tons in 1933 followed by a sharp decline due to the reduction in fishing effort during the Second World War. In 1947, catches were back up to 2,824 tons but then declined steadily to 207 tons in 1970 and just 25 tons in 1994. The fishery attempted to boost catches by moving across to the west Atlantic stock but had to switch focus to other species such as the Shortfin Mako Shark, *Isurus oxyrinchus*, and swordfish (Compagno, 2001).

Currently in the North Atlantic, the Porbeagle Shark is taken primarily in directed longline fisheries, although there is some bycatch from bottom trawls, handlines and gill nets. The majority of the catch in the southern hemisphere is bycatch from tuna longline fleets in the South Pacific and southern Indian Ocean, although there is a small Norwegian targeted fishery (Francis *et al.*, 2008). The only landings reported to the FAO from the southern hemisphere are from the New Zealand fishery, meaning that the fishing mortality for the southern stock is almost unknown (Compagno, 2001).

In the northeast Atlantic, the Porbeagle Shark is covered by EC Regulation No. 1185/2003 which prevents the removal of its fins at sea and the subsequent discard of the body. This applies to all vessels operating in EC waters, as well as to EC vessels operating anywhere (CPOA Sharks, 2009). In addition, a total allowable catch (TAC) applies to this species in European Waters. In 2008 this TAC was 581 tons. Despite scientific advice for a zero TAC for 2009, it was lowered by only 25% to 436 tons with a maximum landing size of 210cm designed to protect breeding individuals (European Commission, 2008). In 2010, the TAC was finally reduced to zero meaning the species cannot be landed by commercial fishers in the EU.

## IUCN RED LIST ASSESSMENT

Vulnerable (2005).

Critically Endangered in northeast Atlantic.

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large shark.
- Powerful jaws and sharp teeth.
- Abrasive skin.

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Text: Richard Hurst.  
Illustrations: Marc Dando.

#### Citation

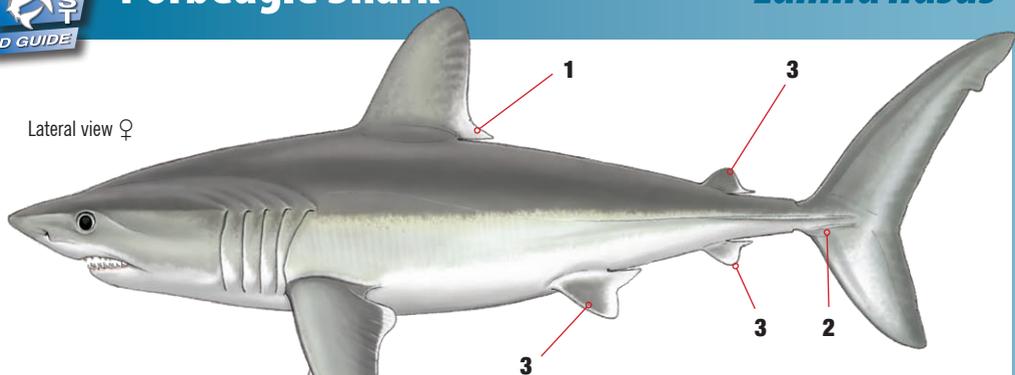
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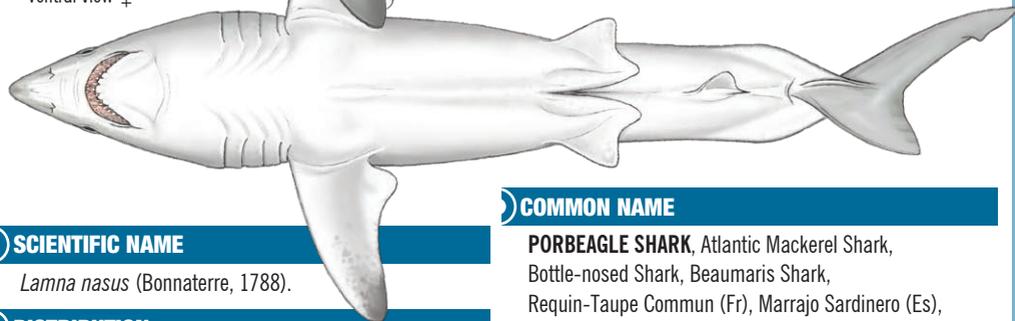
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Lateral view ♀



Ventral view ♀

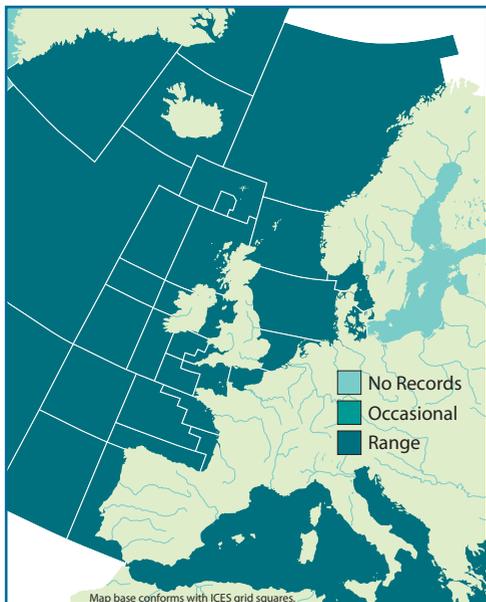


### SCIENTIFIC NAME

*Lamna nasus* (Bonnaterre, 1788).

### DISTRIBUTION

Circumglobal in temperate seas, excluding the North Pacific. Northeast Atlantic from Iceland and Russia to Morocco and Madeira, including the Mediterranean<sup>iii</sup>.



### COMMON NAME

**PORBEAGLE SHARK**, Atlantic Mackerel Shark, Bottle-nosed Shark, Beaumaris Shark, Requin-Taupe Commun (Fr), Marrajo Sardinero (Es), Tiburón Sardinero (Es), Tintorera (Es).

### IDENTIFICATION

- 1 Large first dorsal fin with white free rear tip.
- 2 Secondary keel on caudal fin.
- 3 Very small pelvic, anal and second dorsal fins<sup>i</sup>.

### COLOUR

- White free rear tip of first dorsal fin.
- Dark blue to grey dorsally.
- Pale to white ventrally.
- Adults are smaller and can be darker ventrally in the southern hemisphere<sup>iii</sup>.

### BIOLOGY AND SIZE

- Born: 58–67cm. Mature: 200–219cm ♀ 155–177cm ♂<sup>ii</sup>. Max TL: 365cm<sup>i</sup>.
- Maintains its body temperature through a heat-exchange system allowing it to range into temperate regions<sup>i</sup>.
- 1–5 pups in each litter, average of 4. Gestation period is 8–9 months<sup>ii</sup>.
- Primarily a piscivore, preferring pelagic fish and cephalopods where abundant<sup>iii</sup>.

## TEETH



- Moderately large, blade-like teeth with lateral cusps.
- First upper lateral teeth have nearly straight cusps<sup>iii</sup>.

## SIMILAR SPECIES



○ *Lamna nasus*, **Porbeagle Shark**



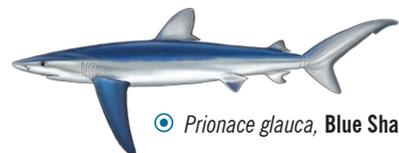
○ *Carcharodon carcharias*,  
**White Shark**



○ *Isurus oxyrinchus*,  
**Shortfin Mako Shark**



○ *Isurus paucus*,  
**Longfin Mako Shark**



○ *Prionace glauca*, **Blue Shark**

## HABITAT

- From surface to 715m in pelagic and coastal waters<sup>iii</sup>.
- Migratory according to temperature with a preference for 7–8°C. Single record of a shark crossing the Atlantic.
- Segregate by size and sex<sup>i</sup>.

## CONSERVATION STATUS

- Heavily fished since the early 1900's, populations have declined significantly in the North Atlantic<sup>iv</sup>.
- **Red List status:** Vulnerable (2005). Critically Endangered in the northeast Atlantic.

## COMMERCIAL IMPORTANCE

- Previously an extremely valuable species taken in trawl, line and gillnet fisheries.
- Utilised primarily for their flesh throughout Europe. Fins are exported and liver oil may be used<sup>iv</sup>.
- 2010 – Subject to a TAC of zero in EU waters.

## HANDLING

- Handle with care.
- Large, powerful shark.
- Sharp teeth and abrasive skin.

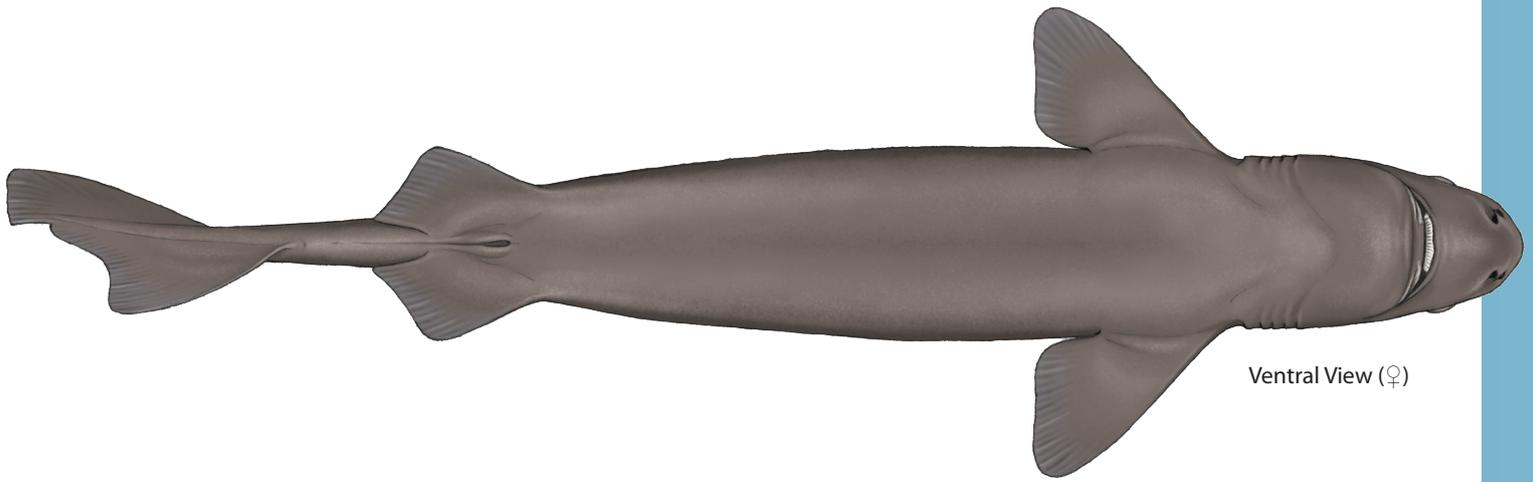
## REFERENCES

- i. Compagno, L. J. V.; 2001. FAO.
- ii. Francis, M. P. *et al*; 2008. Blackwell Publishing.
- iii. Roman, B; Unknown. FLMNH.
- iv. Stevens, J. *et al*; 2006. IUCN Red List.

Lateral View (♀)



Ventral View (♀)



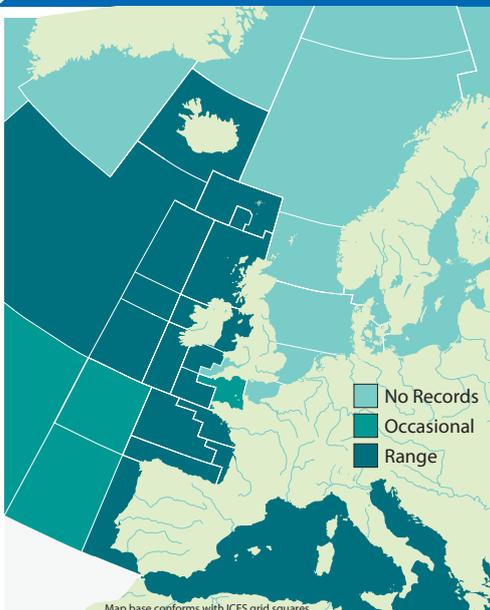
### COMMON NAMES

**Portuguese Dogfish**, Portuguese Shark, Siki Shark, Pailona Commun (Fr), Pailona (Es).

### SYNONYMS

*Centrophorus coelolepis* (Saemundsson, 1922), *Scymnodon melas* (Bigelow, Schroeder & Springer, 1953).

### DISTRIBUTION



The Portuguese Dogfish is found throughout the North Atlantic from Newfoundland to Virginia in the west and from Iceland to Sierra Leone in the east. Also found in the western Mediterranean, the South Atlantic and the western Pacific (Burgess and Bester, Unknown).

### APPEARANCE

- First dorsal fin is smaller than the second, both have inconspicuous spines.
- First dorsal originates behind the pectoral fins, second above the pelvic fins.
- Dorsal fins are relatively small.
- No anal fin.
- Dorsal caudal lobe much longer than the ventral with a strong subterminal notch.
- Adults uniform black or brown.
- Very young individuals bluish black, juveniles darker to black.
- Maximum total length 120cm females, 90cm males.

A stout bodied shark with a short snout and slightly arched mouth. The dorsal fins are tiny with inconspicuous spines. The first dorsal fin is set well behind the pectoral fins, the second above or slightly behind the pelvic fins. There is no anal fin. The dorsal lobe of the caudal fin is much longer than the ventral lobe and has a deep subterminal notch (Compagno, 1984).

Adults are a uniform black or brown on all surfaces. Juveniles are usually darker to black. Very young individuals can be a lighter bluish black. The maximum recorded sizes are 120cm total length for females and 90cm total length for males, although the average length for both sexes is 70–100cm (Burgess and Bester, Unknown).

## SIMILAR SPECIES

*Centroselachus crepidater*, Longnose Velvet Dogfish

*Dalatias licha*, Kitefin Shark

*Scymnodon ringens*, Knifetooth Dogfish

*Zameus squamulosus*, Velvet Dogfish

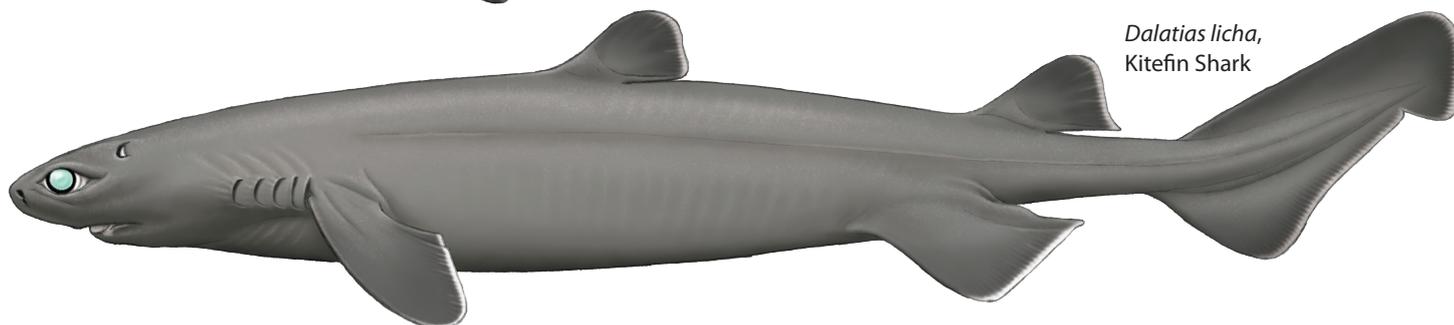
*Centroscymnus coelolepis*,  
Portuguese Dogfish



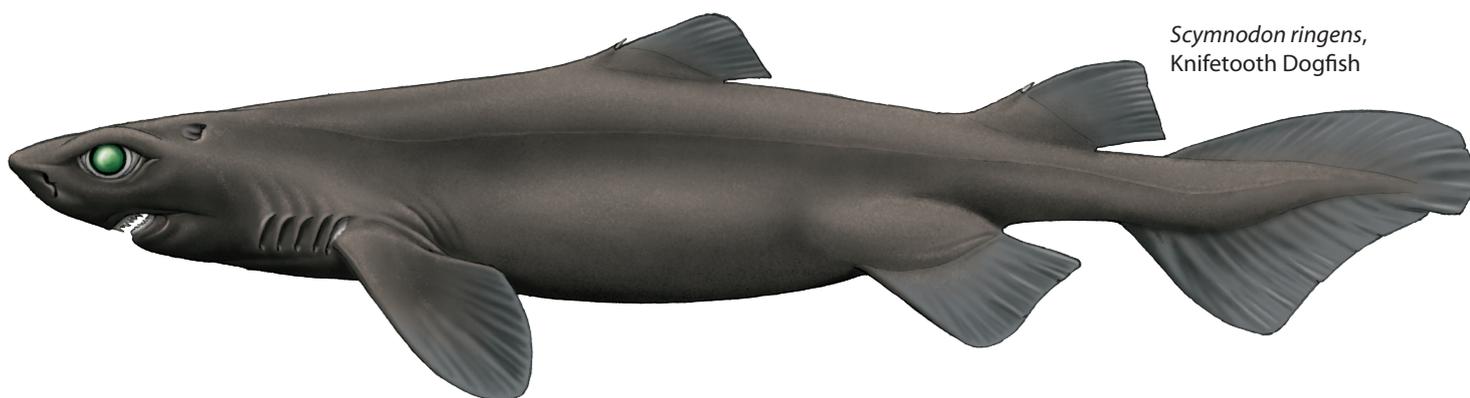
*Centroselachus crepidater*,  
Longnose Velvet Dogfish



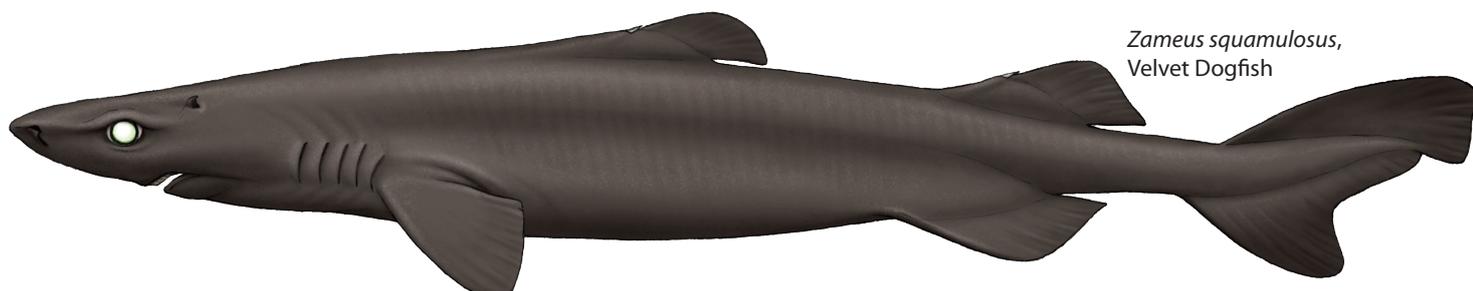
*Dalatias licha*,  
Kitefin Shark



*Scymnodon ringens*,  
Knifetooth Dogfish



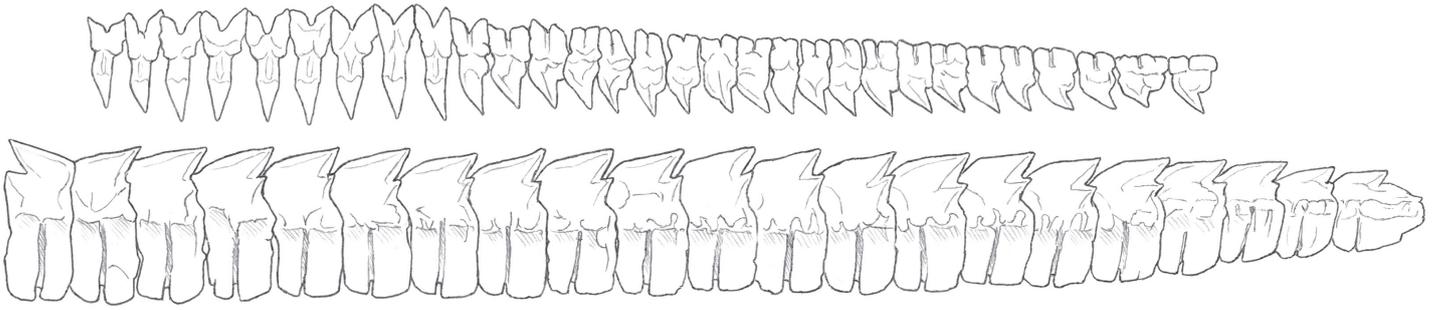
*Zameus squamulosus*,  
Velvet Dogfish



(Not to scale)

## TEETH

The upper and lower teeth are markedly different. The uppers are erect and thin with one lanceolate cusp and no cusplets. The lowers are large and short with oblique cusps and overlapping bases. This forms a cutting edge that can saw through prey while the awl-shaped upper teeth hold it. There are 43–68 teeth in the upper jaw, 29–41 in the lower jaw (Burgess and Bester, Unknown).



## ECOLOGY AND BIOLOGY

### HABITAT

The Portuguese Dogfish can be found on or near the bottom from 270–3,700m, although catches are highest deeper than 1,000m. Surveys from the Portuguese continental shelf have failed to catch the Portuguese Dogfish in water shallower than 800m. It appears to segregate by size and sex with smaller specimens at greater depths and pregnant females found shallowest (Stevens and Correia, 2003).

### EGGCASE

N/A

## DIET

The Portuguese Dogfish feeds primarily on bony fish (*Hoplostethus atlanticus*, alepocephalids and myctophids), other elasmobranchs and cephalopods. It has also been known to feed on gastropods and cetacean meat (either scavenged or possibly taken from live animals in the manner of cookiecutter sharks, *Isistius* spp.) (Stevens and Correia, 2003).

## REPRODUCTION

In Australian waters, male Portuguese Dogfish reach sexual maturity at around 75cm total length, females a little larger at 95cm. In Japanese and European waters, maturity has been reported as between 70–86cm for males and 100cm for females. There does not appear to be a fixed breeding period, although gestation periods are unknown. Litters of 8–19 individuals have been recorded and pups are born at around 30cm total length (Stevens and Correia, 2003).

## COMMERCIAL IMPORTANCE

The Portuguese Dogfish is mainly a bycatch species taken by trawl and longline fisheries. However, there is some targeting for its liver and flesh and it is utilized in the east Atlantic for fishmeal and human consumption (Stevens and Correia, 2003; Compagno, 1984).

## THREATS, CONSERVATION, LEGISLATION

The Portuguese Dogfish is mainly taken as a bycatch species in deepwater trawl and line fisheries although there is some targeting for its flesh and oil. Quantitative data on populations is lacking but its low abundance, demersal habitat and low productivity are likely to make it extremely vulnerable to fishing pressure (Stevens and Correia, 2003).

In ICES sub-areas V, VI, VII, VIII and IX a Total Allowable Catch (TAC) of 1,646 tons (2008) applies to the deepwater sharks *Centroscymnus coelolepis*, *Centrophorus granulosus*, *C. squamosus*, *Deania calcea*, *Dalatias licha*, *Etmopterus princeps*, *E. spinax*, *Centrosyllium fabricii*, *Galeus melastomus*, *G. murinus* and all *Apristurus* spp.. Additionally, these species have a TAC of 20 tons in sub-area X and a TAC of 49 tons (including *Deania histricosa* and *D. profundorum*) in sub-area XII (CPOA Shark, 2009).

## IUCN RED LIST ASSESSMENT

Near Threatened (2003).  
Endangered in northeast Atlantic.

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Dorsal spines.
- Abrasive skin and sharp teeth.

## REFERENCES

- BURGESS, G., BESTER, C. Unknown. Portuguese Shark. Florida Museum of Natural History. <http://www.flmnh.ufl.edu/fish/>.
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Text: Richard Hurst.  
Illustrations: Marc Dando.

### Citation

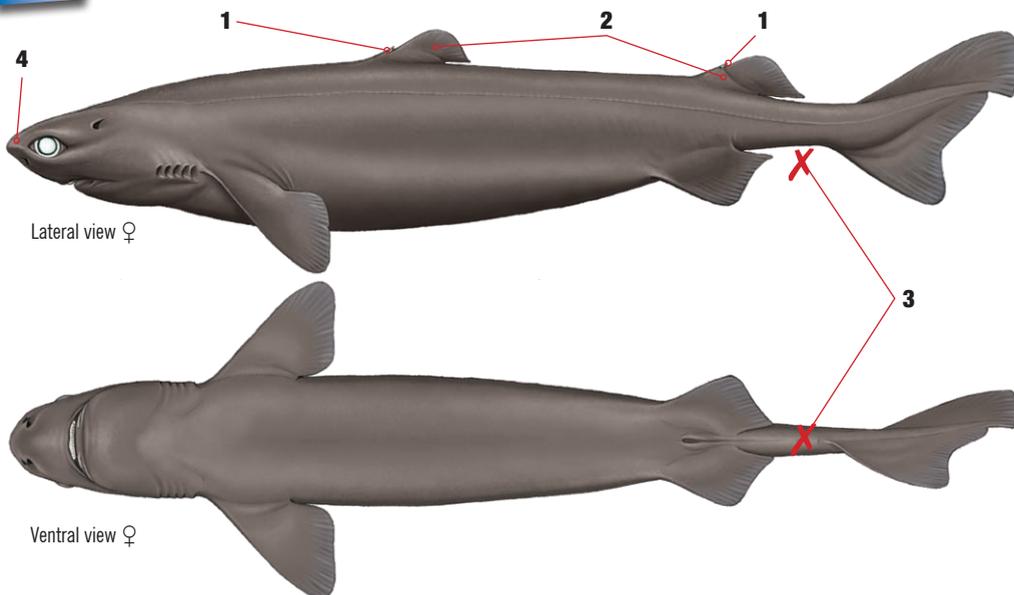
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For more ID materials visit [www.sharktrust.org/ID](http://www.sharktrust.org/ID).

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# Portuguese Dogfish *Centroscymnus coelolepis*



Lateral view ♀

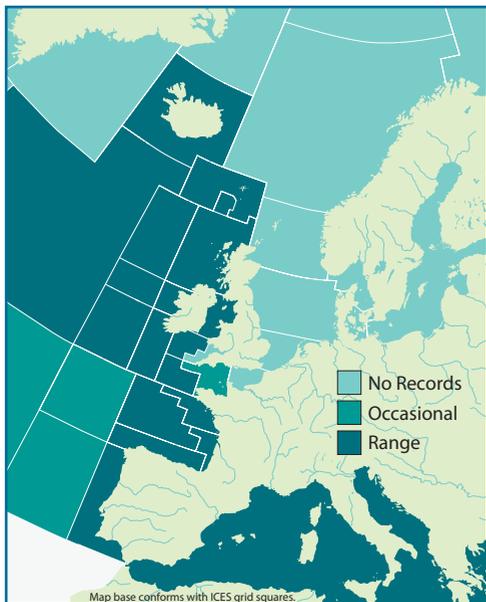
Ventral view ♀

## SCIENTIFIC NAME

*Centroscymnus coelolepis* (Bocage & Capello, 1864).

## DISTRIBUTION

Patchy worldwide distribution. Northeast Atlantic from Iceland to Sierra Leone, including the western Mediterranean Sea<sup>1</sup>.



## COMMON NAME

**PORTUGUESE DOGFISH**, Portuguese Shark, Siki Shark, Pailona Commun (Fr), Pailona (Es).

## IDENTIFICATION

- 1 Tiny dorsal spines, sometimes not visible.
- 2 Second dorsal fin larger than first.
- 3 No anal fin.
- 4 Distinctive short snout<sup>ii</sup>.

## COLOUR

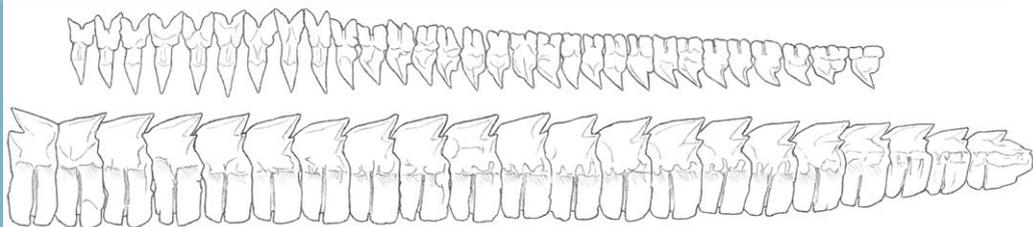
- Adults and juveniles uniform black/brown.
- Bluish black when very young.
- No markings<sup>i</sup>.

## BIOLOGY AND SIZE

- Born: 30cm. Mature: 100cm ♀, 70–86cm ♂<sup>vi</sup>. Max TL: 121cm ♀, 101cm ♂<sup>v</sup>.
- Feeds predominately on cephalopods along with small amounts of fish, decapod crustaceans, invertebrates and other chondrichthyans<sup>iv</sup>.
- Feeds on large fish and marine mammals in the manner of cookiecutter sharks, *Isistius* spp.<sup>iii</sup>.



## TEETH



- Slender, lanceolate upper teeth.
- Blade-like lower teeth with short, oblique cusps<sup>ii</sup>.

## SIMILAR SPECIES



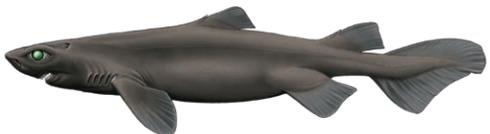
- Centroscyrnus coelolepis*, Portuguese Dogfish



- Centroselachus crepidater*, Longnose Velvet Dogfish



- Dalatias licha*, Kitefin Shark



- Scymnodon ringens*, Knifetooth Shark



- Zameus squamulosus*, Velvet Dogfish

## HABITAT

- Demersal, 270–3,700m.
- Rare shallower than 400m.
- Segregate by size and sex with pregnant females found shallowest and young individuals found deepest<sup>vi</sup>.

## CONSERVATION STATUS

- Population data lacking but low abundance, demersal habitat and low fecundity make it extremely vulnerable to fishing pressure. Large declines have been observed<sup>vi</sup>.
- Red List status:** Near Threatened (2003). Endangered in the northeast Atlantic.

## COMMERCIAL IMPORTANCE

- Mainly a bycatch species taken in trawl and line fisheries.
- Some targeted fishing for its liver and flesh<sup>vi</sup>.
- It is utilised in the East Atlantic for human consumption and fishmeal<sup>ii</sup>.
- 2010 – Subject to a zero TAC in EU waters.

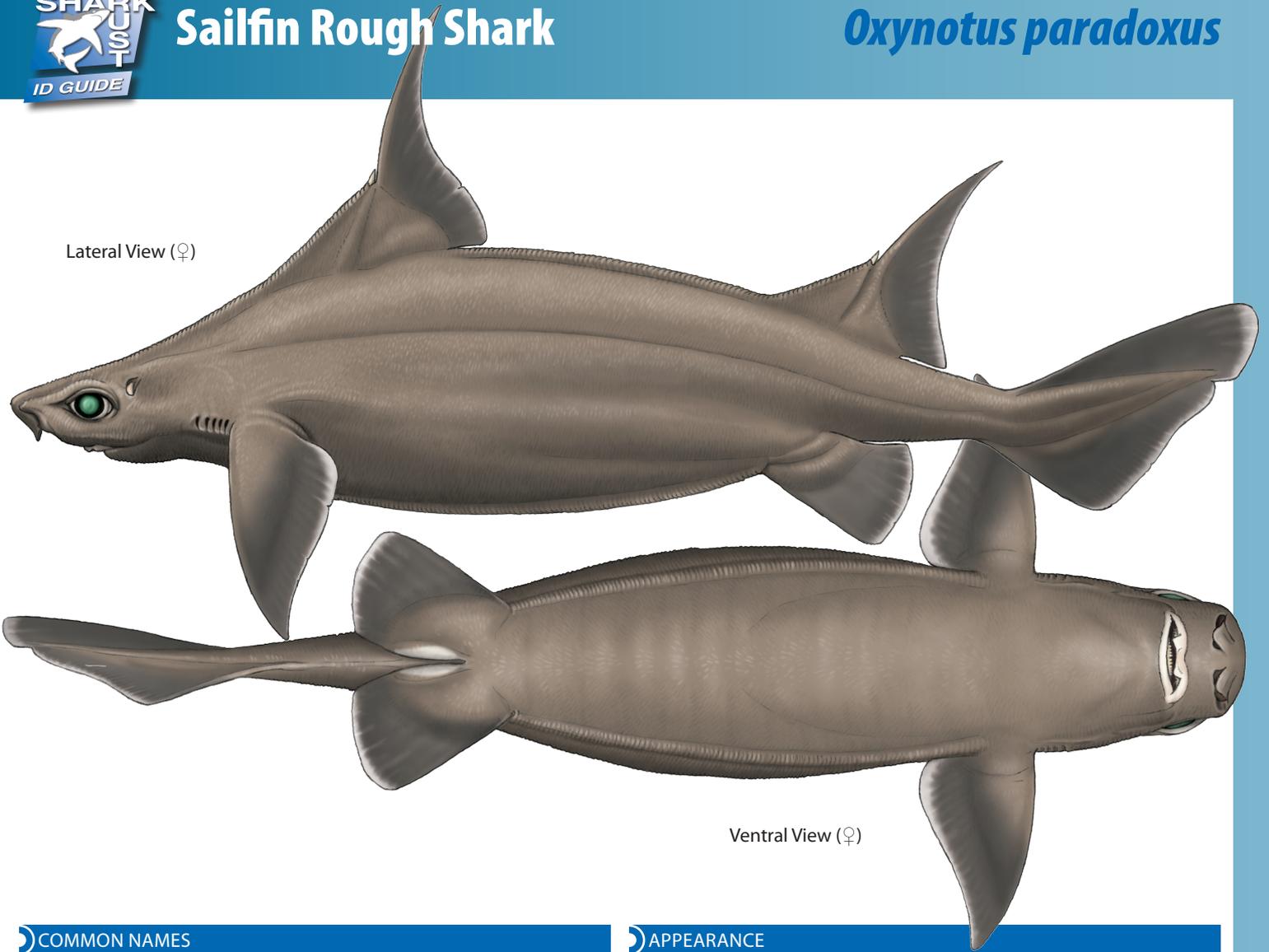
## HANDLING

- Handle with care.
- Dorsal spines.
- Abrasive skin and sharp teeth.

## REFERENCES

- Burgess, G. *et al*; Unknown. FLMNH.
- Compagno, L. J. V.; 1984. FAO.
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- Dyb, J. E. *et al*; 2004. Møreforsking.
- Stevens, J. *et al*; 2003. IUCN Red List.

Lateral View (♀)



Ventral View (♀)

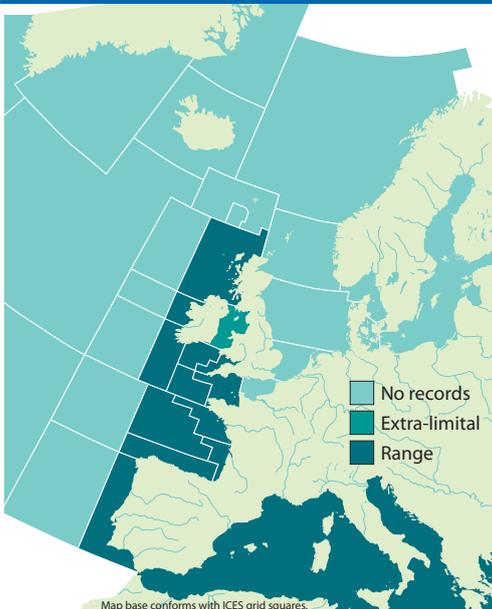
### COMMON NAMES

**Sailfin Rough Shark**, Kite-Fin Shark, Humantin (Fr), Cerdo Marino Velero (Es).

### SYNONYMS

*Centrina paradoxa* (Frade, 1929).

### DISTRIBUTION



The Sailfin Rough Shark is known only from the northeast Atlantic from Scotland in the north, Senegal and the Cape Verde Islands in the south and the Azores in the east (Avezedo *et al.*, 2003). It has been noted that it is moderately abundant off the British Isles (Compagno, 1984).

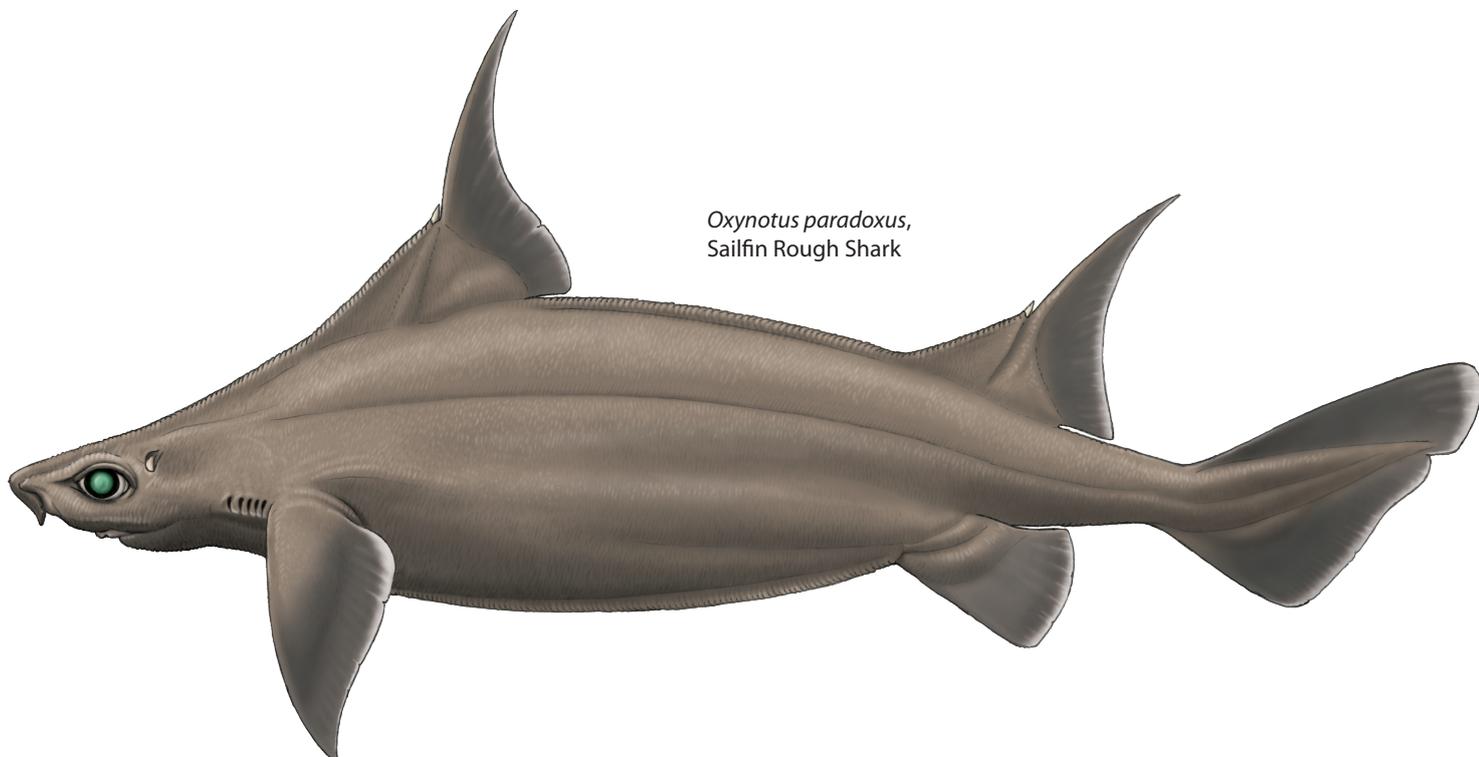
### APPEARANCE

- Compressed body, triangular in cross section.
- Broad, flattened head with flat, blunt snout.
- Dorsal fins tall, narrow and pointed with concave trailing edges.
- First dorsal spine leans back, unique in the northeast Atlantic.
- No anal fin.
- Spiracles relatively small and almost circular.
- Colouration is dark brown in fresh specimens.
- No prominent markings.

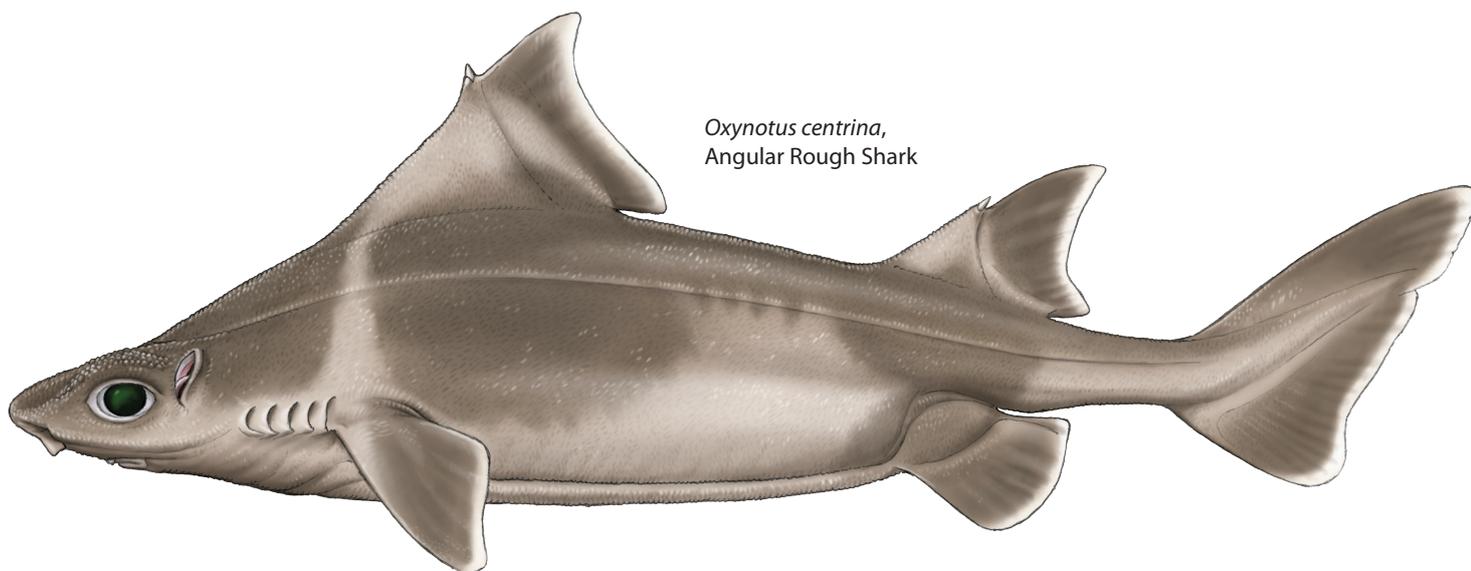
One of only two species of Oxynotidae found in the northeast Atlantic, the Sailfin Rough Shark is unlikely to be confused with any species other than the Angular Rough Shark, *Oxynotus centrina*. The most useful features in distinguishing these species are the spiracles, dorsal fins and dermal denticles. The spiracles of the Angular Rough Shark are very large and vertically expanded while the spiracles of the Sailfin Rough Shark are relatively small and almost circular. The first dorsal fin spine of the Sailfin Rough Shark leans backwards while it leans forwards in the Angular Rough Shark. This is only seen in the Sailfin Rough Shark and the Japanese Rough Shark, *Oxynotus japonicus*, the latter being endemic to Japan and unlikely to be encountered in the northeast Atlantic (Avezedo *et al.*, 2003). For details and SEM images of the differing dermal denticles see Avezedo *et al.* (2003).

## SIMILAR SPECIES

*Oxynotus centrina*, Angular Rough Shark



*Oxynotus paradoxus*,  
Sailfin Rough Shark



*Oxynotus centrina*,  
Angular Rough Shark

(Not to scale)

### TEETH

The upper teeth are lanceolate, the lower teeth are blade-like and arranged in less than 12 rows (Compagno, 1984).

### ECOLOGY AND BIOLOGY

#### HABITAT

The Sailfin Rough Shark is an uncommon demersal shark from Atlantic continental slopes that has recently been identified on the mid-Atlantic ridge around the Azores. This is a significant westward expansion of its known range and it is possible that the slope and ridge populations are separate. Alternatively, their habitat could extend deeper than presently thought and a continuous population may be present along the Atlantic sea floor (Avezedo *et al.*, 2003).

It is most commonly captured between 500–600m, though it has been recorded from 265–800m with one isolated report from 92m (Avezedo *et al.*, 2003). It is believed that the Oxynotidae are relatively poor swimmers and use their large, oil filled livers to remain buoyant (Norman, 2007).

Of the specimens reported before 2003, a bias has been observed towards females. The majority of these animals were captured on the Atlantic Slope around the British Isles leading researchers to speculate that a reproductive migration towards the continental shelf occurs in springtime (Avezedo *et al.*, 2003).

#### DIET

The diet of the Sailfin Rough Shark is essentially unknown but unidentified small benthic fishes and invertebrates have been reported (Carpenter, 2009).

#### REPRODUCTION

The reproductive strategy and life history of the Sailfin Rough Shark are essentially unknown except that it is an ovoviviparous species, which gives birth to pups measuring approximately 25cm in length. The smallest mature male so far reported was 75cm in length (Compagno *et al.*, 2005).

#### EGGCASE

N/A

## COMMERCIAL IMPORTANCE

The Sailfin Rough Shark is of little commercial value. It is an uncommon bycatch of offshore trawl fisheries and is sometimes used for fishmeal if landed (Compagno, 1984).

## THREATS, CONSERVATION, LEGISLATION

Very little is known of the pressures on the Sailfin Rough Shark and its ability to withstand them. Its known depth range is entirely within the range of deepwater fisheries operating in the northeast Atlantic, although it is possible that the south of its range and the Mid-Atlantic Ridge act as refuge areas from the more intense fishing of the European continental slopes.

Given the supposed low abundance of the species and the lack of information regarding its life history, it is possible that fisheries are having a significant impact on populations. More information is needed regarding the distribution, population structure and life history of the species before any future management plans are to be effective (Gibson *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Data Deficient (2008).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large dorsal spines.
- Abrasive skin.
- Sharp teeth.

### REFERENCES

- AVEZEDO, J. M. N., SOUSA, F. L., BRUM, J. M. M. 2003. Dermal Denticles and Morphometrics of the Sailfin Roughshark *Oxynotus paradoxus* (Elasmobranchii, Oxynotidae), with Comments on its Geographic Distribution. *Cybium*, 27 (2): 117–122.
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Illustrations: Marc Dando.

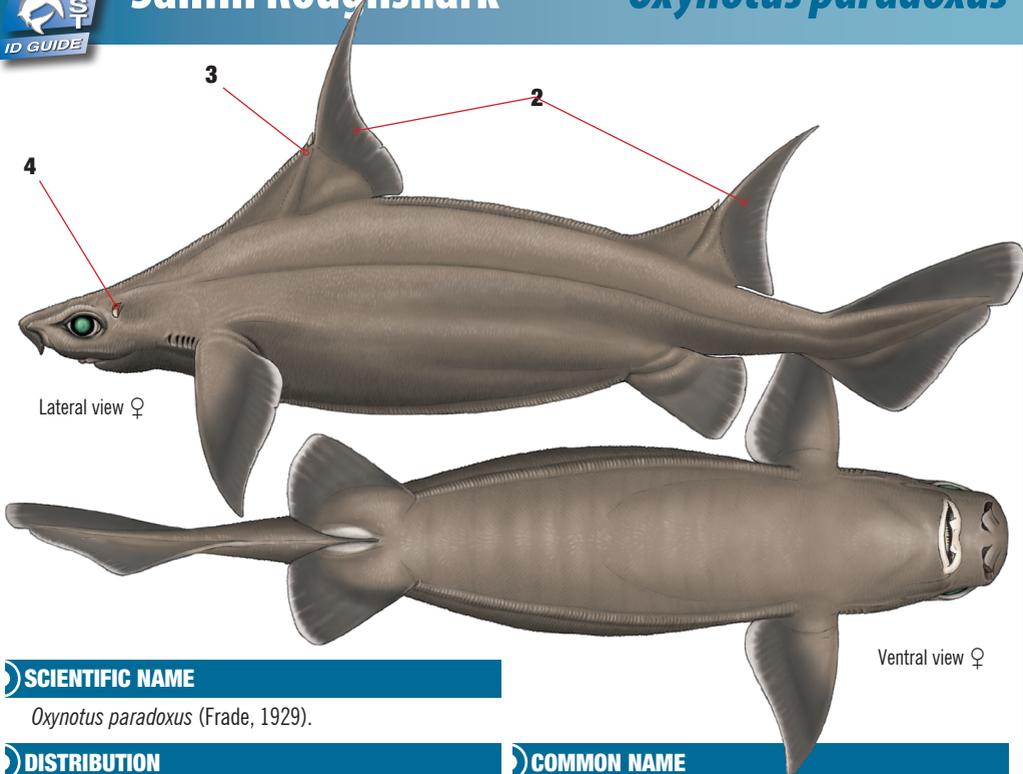
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Lateral view ♀

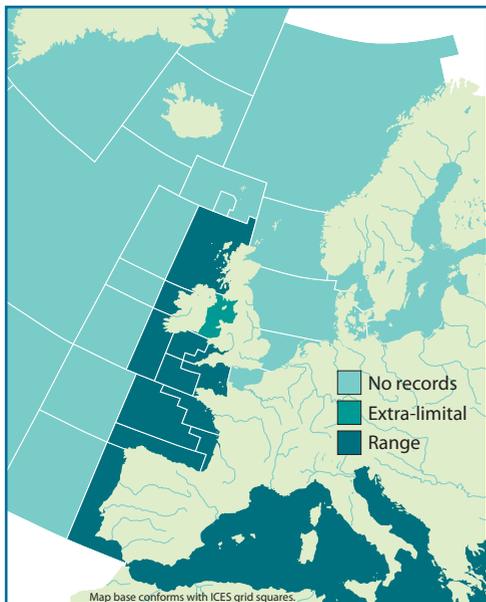
Ventral view ♀

## SCIENTIFIC NAME

*Oxynotus paradoxus* (Frade, 1929).

## DISTRIBUTION

Northeast Atlantic from Scotland to Senegal and the Cape Verde Islands. Also known from the Azores and Mid-Atlantic Ridge<sup>i</sup>.



## COMMON NAME

**SAILFIN ROUGHSHARK**, Kite-Fin Shark, Humantin (Fr), Cerdo Marino Velero (Es).

## IDENTIFICATION

- 1 Compressed body, triangular in cross section.
- 2 Two large, sail-like dorsal fins with spines and concave trailing edges.
- 3 First dorsal spine angled back<sup>v</sup>.
- 4 Small, circular spiracles<sup>i</sup>.

## COLOUR

- Uniform dark brown.
- No prominent markings<sup>iii</sup>.

## BIOLOGY AND SIZE

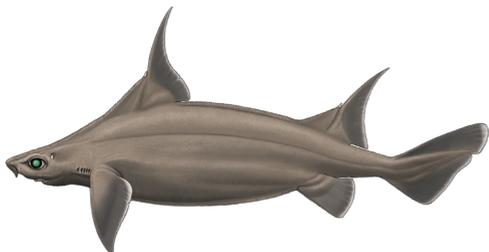
- Born: 25cm. Mature: ~75cm. Max TL: ~188cm<sup>iv</sup>.
- Ovoviviparous, life history traits unknown<sup>iv</sup>.
- Diet mainly unknown but includes small, benthic fish and invertebrates<sup>ii</sup>.



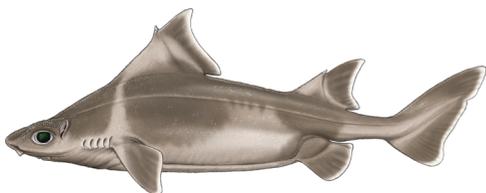
## TEETH

- Lanceolate upper teeth.
- Lower teeth blade-like, less than 12 rows<sup>iii</sup>.

## SIMILAR SPECIES



○ *Oxynotus paradoxus*, Sailfin Rough Shark



○ *Oxynotus centrina*, Angular Roughshark

## HABITAT

- 265–800m, most common 500–600m. Single record from 92m<sup>i</sup>.
- Recently identified on the Mid-Atlantic Ridge. Shelf and slope populations may be continuous with the species ranging deeper than currently known or they may be separate<sup>i</sup>.
- Reproductive migrations towards the continental shelf may occur in springtime<sup>i</sup>.

## CONSERVATION STATUS

- Poorly understood but its distribution, depth range and life history characteristics may make it vulnerable to deepwater fisheries<sup>v</sup>.
- **Red List status:** Data Deficient (2008).

## COMMERCIAL IMPORTANCE

- Minor bycatch for offshore trawl fleets.
- Usually discarded but may be used for fishmeal if landed.
- Believed to be bad luck in the Mediterranean and are discarded immediately. Survival rates may be high<sup>v</sup>.

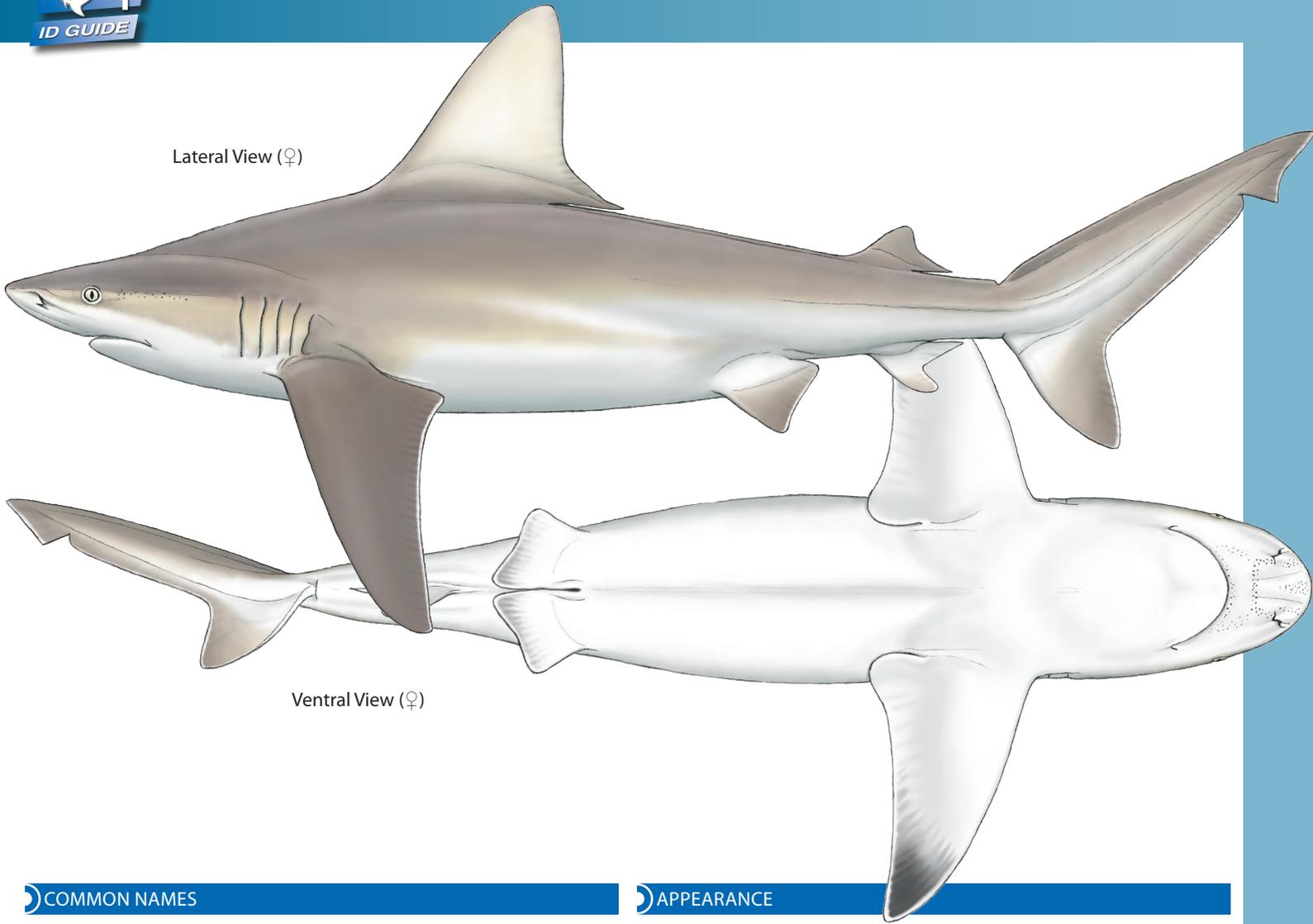
## HANDLING

- Handle with care.
- Large dorsal spines.
- Abrasive skin.
- Sharp teeth.

## REFERENCES

- Avezedo, J. M. N. *et al*; 2003. *Cybium*.
- Carpenter, K. E; 2009. FishBase.
- Compagno, L. J. V; 1984. FAO.
- Compagno, L. J. V. *et al*; 2005. HarperCollins Publishers.
- Soldo, A. *et al*; 2008. IUCN Red List.

Lateral View (♀)



Ventral View (♀)

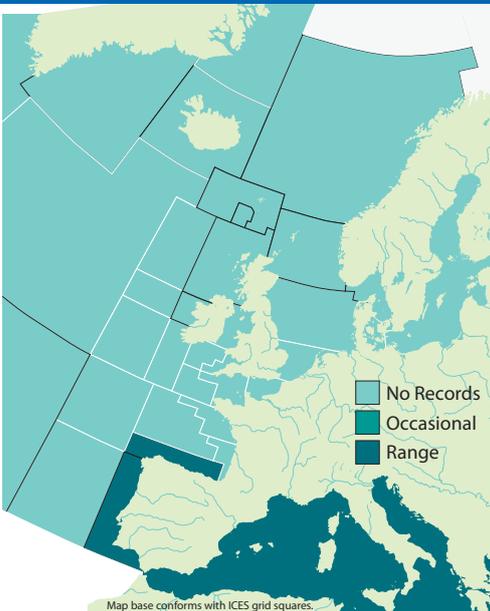
### COMMON NAMES

**Sandbar Shark**, Brown Shark, Queriman Shark, Thickskin Shark, Requin Gris (Fr), Tiburón Trozo (Es).

### SYNONYMS

*Squalus plumbeus* (Nardo, 1827), *Carcharias (Prionodon) milberti* (Valenciennes, in Müller & Henle), *Eulamia milberti* (Valenciennes, in Müller & Henle), *Galeolamna stevensi* (Ogilby, 1911), *Carcharhinus japonicus* (Schlegel, 1850), *Carcharhinus bleekeri* (Dumeril, 1865), *Carcharhinus platyodon* (Poey, 1861).

### DISTRIBUTION



The Sandbar Shark is found almost worldwide in warm temperate and tropical waters. Its distribution in the east Atlantic is patchy from Portugal to Zaire, including the whole of the Mediterranean Sea (Compagno, 1984).

### APPEARANCE

- Short, rounded snout.
- Extremely tall, triangular first dorsal fin with origin over or in front of pectoral insertions.
- Large pectoral fins.
- Moderately large second dorsal with short free rear tip.
- No conspicuous markings on fins.
- Grey blue to brown dorsally. Lighter to white ventrally.

The most distinctive feature of the Sandbar Shark is the tall first dorsal fin which originates over or in front of the pectoral insertions. The pectoral and second dorsal fins are also moderately large, although not to the same degree. There are no conspicuous markings on these fins (Compagno, 1984). It is grey-blue to brown dorsally, lighter to white ventrally (Knickle, Unknown).

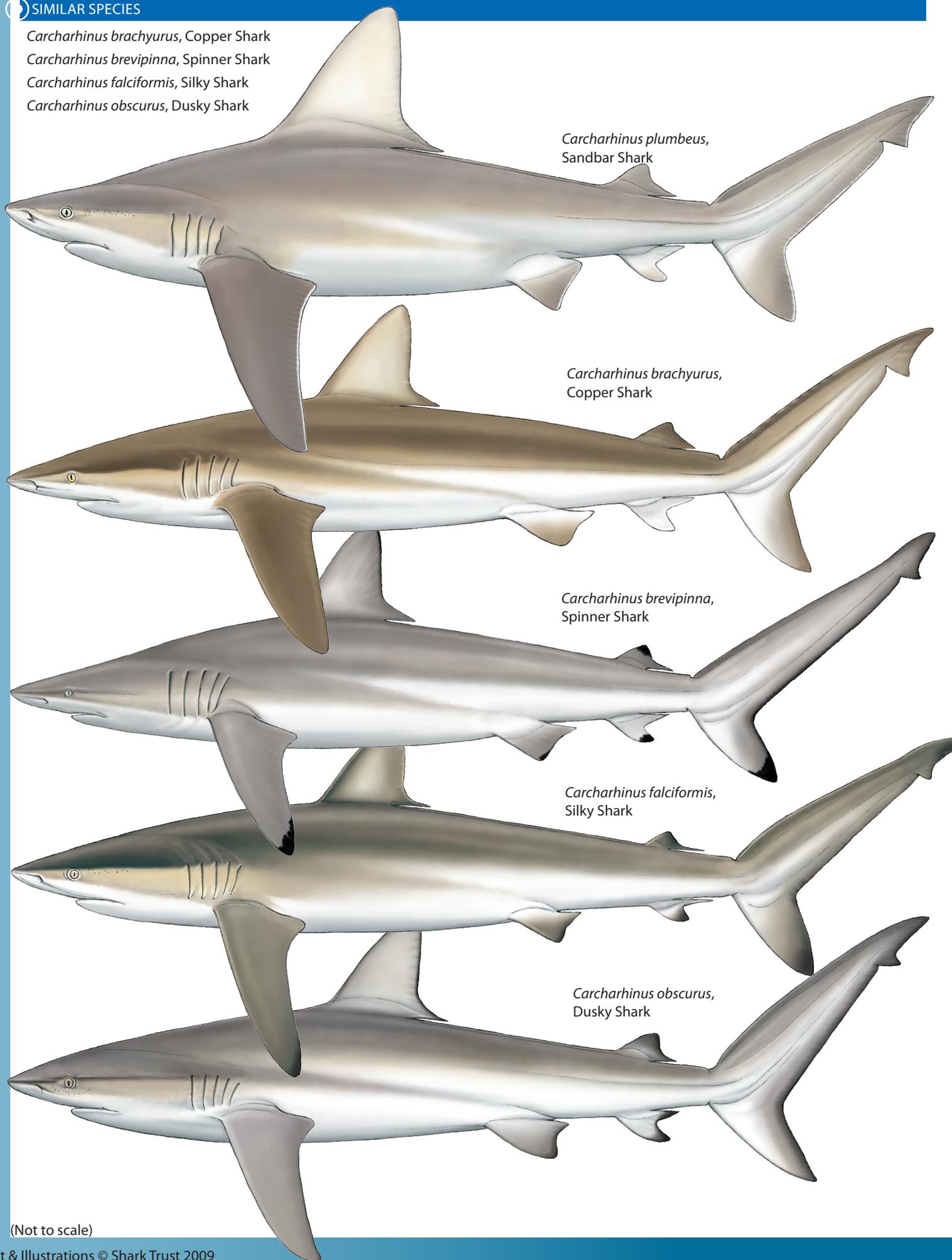
## SIMILAR SPECIES

*Carcharhinus brachyurus*, Copper Shark

*Carcharhinus brevipinna*, Spinner Shark

*Carcharhinus falciformis*, Silky Shark

*Carcharhinus obscurus*, Dusky Shark



*Carcharhinus plumbeus*,  
Sandbar Shark

*Carcharhinus brachyurus*,  
Copper Shark

*Carcharhinus brevipinna*,  
Spinner Shark

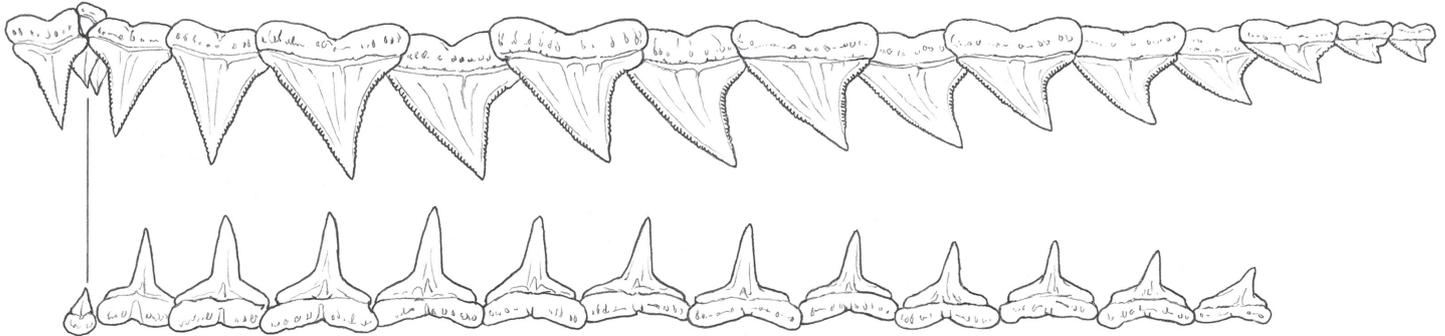
*Carcharhinus falciformis*,  
Silky Shark

*Carcharhinus obscurus*,  
Dusky Shark

(Not to scale)

## TEETH

The upper teeth are broadly triangular, serrated and have high cusps. The lower teeth are narrower and more finely serrated (Knickle, Unknown).



## ECOLOGY AND BIOLOGY

### HABITAT

Predominantly a bottom dwelling, shallow water coastal species, the Sandbar Shark is seldom seen at the surface. It is most commonly found from 20–65m around continental shelves, oceanic banks and island terraces, but can be found in harbours, estuaries and at the mouths of rivers and bays. Unlike some other *Carcharhinus* species in the same habitats, it does not enter freshwater. It is believed to favour smooth substrates such as sand and mud, avoiding coral and rocky areas (Knickle, Unknown).

### REPRODUCTION

Female Sandbar Sharks reach sexual maturity around 145–180cm in length, males around 130–180cm. It is a viviparous species utilising a yolk-sac placenta to nourish embryos. The gestation period is 8–12 months depending on location, with litters of 6–13 pups recorded. The size at birth is around 55–70cm. These pups are born in shallow nursery areas where they form large schools and move south and offshore during the winter months. This migration is reversed during the summer. This behaviour is reported from animals up to 5 years old (Knickle, Unknown).

### DIET

The Sandbar Shark is primarily a predator on relatively small bottom fishes, with some molluscs and crustaceans taken. Its diet includes sardines, shad, menhaden, anchovies, sea catfishes, moray and snake eels, pipefish, barracuda, mullets, goatfishes, hairtails, spanish mackerel, bonito, mackerel, jacks, groupers, croakers, grunts, porgies, flounders and soles, sea robins, toadfish, cusk eels, porcupine fish, sharpnose sharks (*Rhizoprionodon* spp.), spiny dogfish (*Squalus* spp.), bonnethead sharks, guitarfish, skates, stingrays, cow-nosed rays, squid, cuttlefish, octopi, bivalves and conchs, amphipods, shrimp and crabs. It does not consume garbage and mammalian carrion as a rule, unlike some other members of its genus. Evidence from fisheries indicates that very fresh fish bait is greatly preferred to stale or even fresh-frozen fish. In addition, fish is greatly preferred to mammalian meat (Compagno, 1984).

The Sandbar Shark feeds by day and night, although more actively at night. It is thought that it is far more successful in obtaining a regular supply of food than larger Carcharhinids such as the Tiger Shark, *Galeocerdo cuvier*, the Bull Shark, *Carcharhinus leucas*, and the Ducky Shark, *Carcharhinus obscurus*. This is reflected in the greater number of sandbar sharks caught with full or nearly full stomachs, and liver weight, which shows much less fluctuation in sandbar sharks than in the three larger species. Data from captive individuals suggests that digestion is relatively rapid, and prey is largely digested after only two days (Compagno, 1984).

## COMMERCIAL IMPORTANCE

The Sandbar Shark is a highly important commercial species, particularly off the eastern coast of the United States of America where it is the primary species taken in the commercial shark fishery. It is targeted and taken as bycatch on longlines, handlines, set bottom-nets and also by recreational anglers using rods and reels. Its flesh can be utilised fresh and preserved for human consumption, its fins for sharkfin soup, its hide for leather, its liver for oil and its carcass for fishmeal (Knickle, Unknown).

## THREATS, CONSERVATION, LEGISLATION

The Sandbar Shark is a large, slow growing, late maturing species with low fecundity. It is predominantly a coastal species common and widespread in tropical and warm temperate seas worldwide, making it a target for shark fisheries across its range. It has been severely overfished in the western north and central Atlantic and, despite a management plan implemented in 2000, stocks are thought to be down to 26–43% of virgin biomass. Off western Australia, stocks have declined to around 35% of virgin biomass. It is also considered severely overfished in the Mediterranean (Gibson *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Vulnerable (in prep. 2009).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

- COMPAGNO, L. J. V. 1984. FAO Species Catalogue, Vol. 4, Part 1: Sharks of the World. An Annotated and Illustrated Catalogue of Shark Species Known to Date. FAO. Rome, Italy.
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- MUSICK, J. A., STEVENS, J. D., BAUM, J. K., BRADAI, M., CLÒ, S., FERGUSSON, I., GRUBBS, R. D., SOLDI, A., VACCHI, M., VOOREN, C. M. 2007. *Carcharhinus plumbeus*. In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.1. [www.iucnredlist.org](http://www.iucnredlist.org).

Text: Richard Hurst.  
Illustrations: Marc Dando.

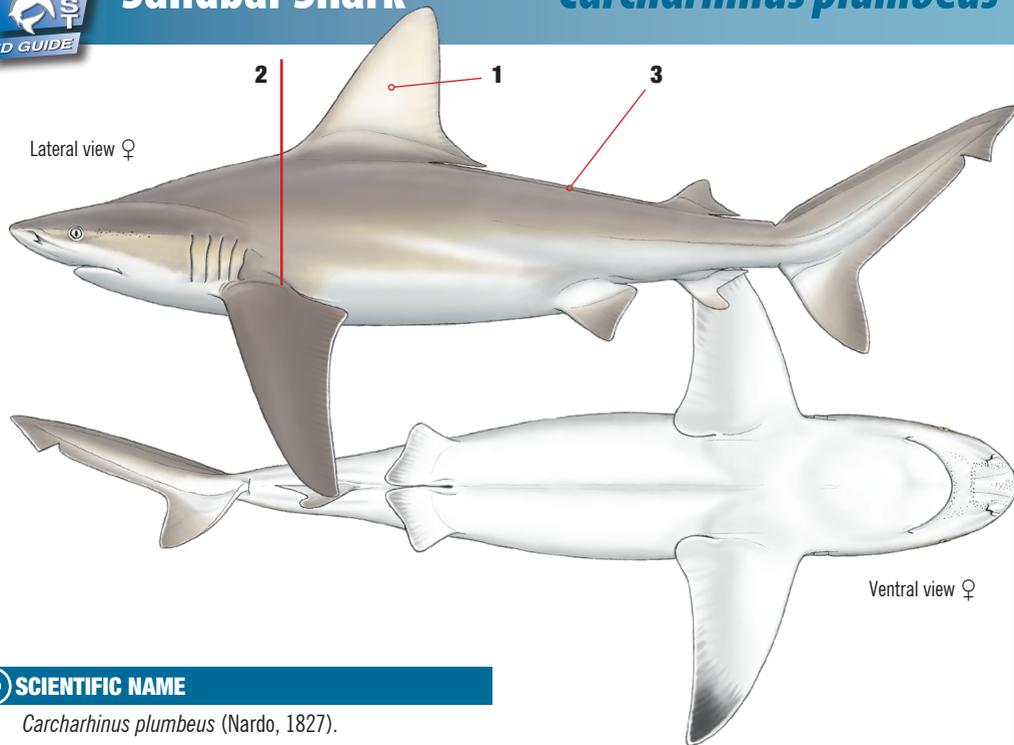
### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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## SCIENTIFIC NAME

*Carcharhinus plumbeus* (Nardo, 1827).

## DISTRIBUTION

Virtually circumglobal in tropical and warm temperate seas. East Atlantic from Portugal to the Congo, including the Mediterranean Sea<sup>1</sup>.



## COMMON NAME

**SANDBAR SHARK**, Brown Shark, Queriman Shark, Thickskin Shark, Requin Gris (Fr), Tiburón Trozo (Es).

## IDENTIFICATION

- 1 Very large, erect first dorsal fin.
- 2 First dorsal fin over or ahead of pectoral fin inserts.
- 3 Interdorsal ridge present<sup>i</sup>.

## COLOUR

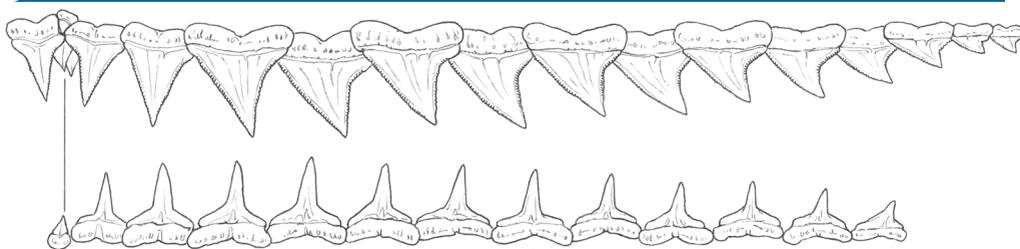
- Grey-blue to brown-grey dorsally.
- Fades to white ventrally.
- No obvious markings but fin tips sometimes darker<sup>ii</sup>.

## BIOLOGY AND SIZE

- Born: 40–65cm. Mature: 129–158cm ♀, 123–156cm ♂. Max TL: 240cm, possibly 300cm<sup>i</sup>.
- 1–14 young in litters, commonly 5–12<sup>i</sup>. Gestation period 8–12 months depending on location<sup>ii</sup>.
- Preys primarily on small bottom fishes with some molluscs and crustaceans taken. Generally does not take carrion or waste<sup>1</sup>.

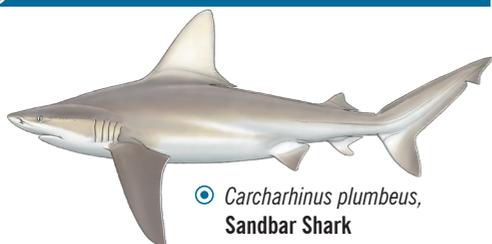


## TEETH



- Broadly triangular, serrated upper teeth with high cusps.
- Lower teeth narrower and more finely serrated<sup>ii</sup>.

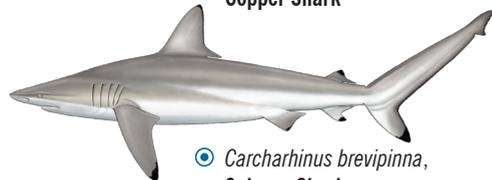
## SIMILAR SPECIES



● *Carcharhinus plumbeus*,  
**Sandbar Shark**



● *Carcharhinus brachyurus*,  
**Copper Shark**



● *Carcharhinus brevipinna*,  
**Spinner Shark**



● *Carcharhinus falciformis*,  
**Silky Shark**



● *Carcharhinus obscurus*,  
**Dusky Shark**

## HABITAT

- Coastal and pelagic from surf zone to 280m, usually near bottom.
- Common at bay mouths, harbours, river mouths and shallow muddy or sandy banks. Not known to enter freshwater.
- Migratory with temperature, has been reported travelling in large schools<sup>iii</sup>.

## CONSERVATION STATUS

- Fisheries tightly controlled in the northwest Atlantic but less well managed elsewhere<sup>iii</sup>.
- **Red List status:** Near Threatened (2000).

## COMMERCIAL IMPORTANCE

- Taken by longlines, hook and line and set bottom nets. Primarily bycatch but targeted where abundant.
- Large fins valuable for shark fin soup. Meat utilised fresh or preserved for human consumption. Hide prized for leather and liver oil used for vitamins.
- Sought after as a game fish by recreational anglers<sup>iii</sup>.

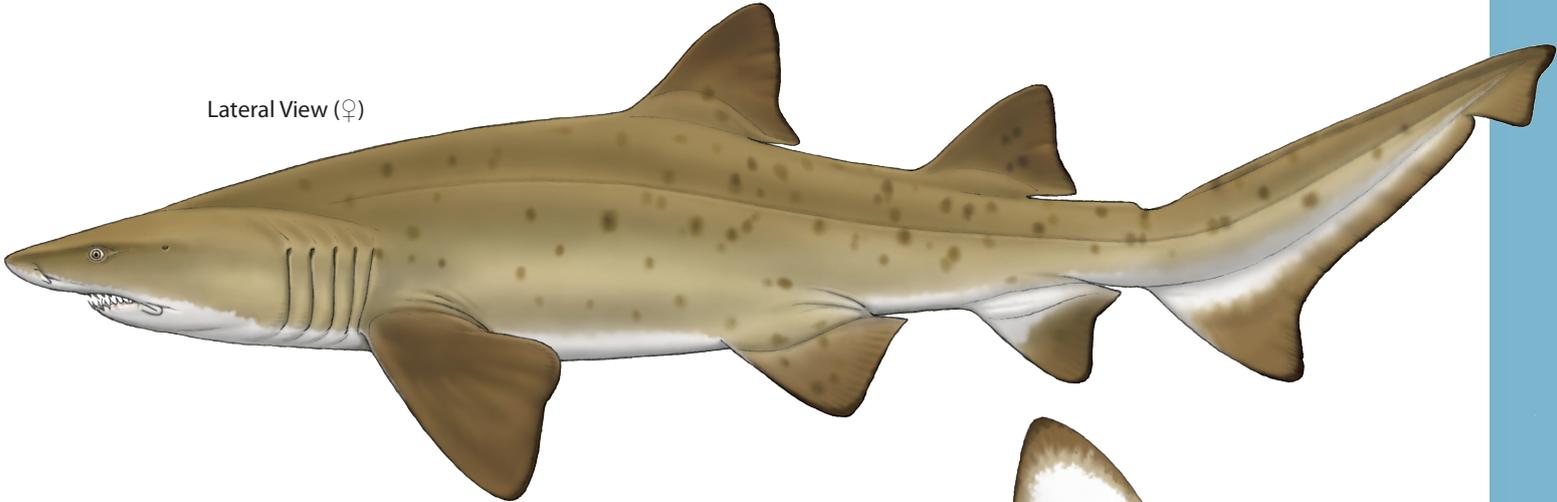
## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

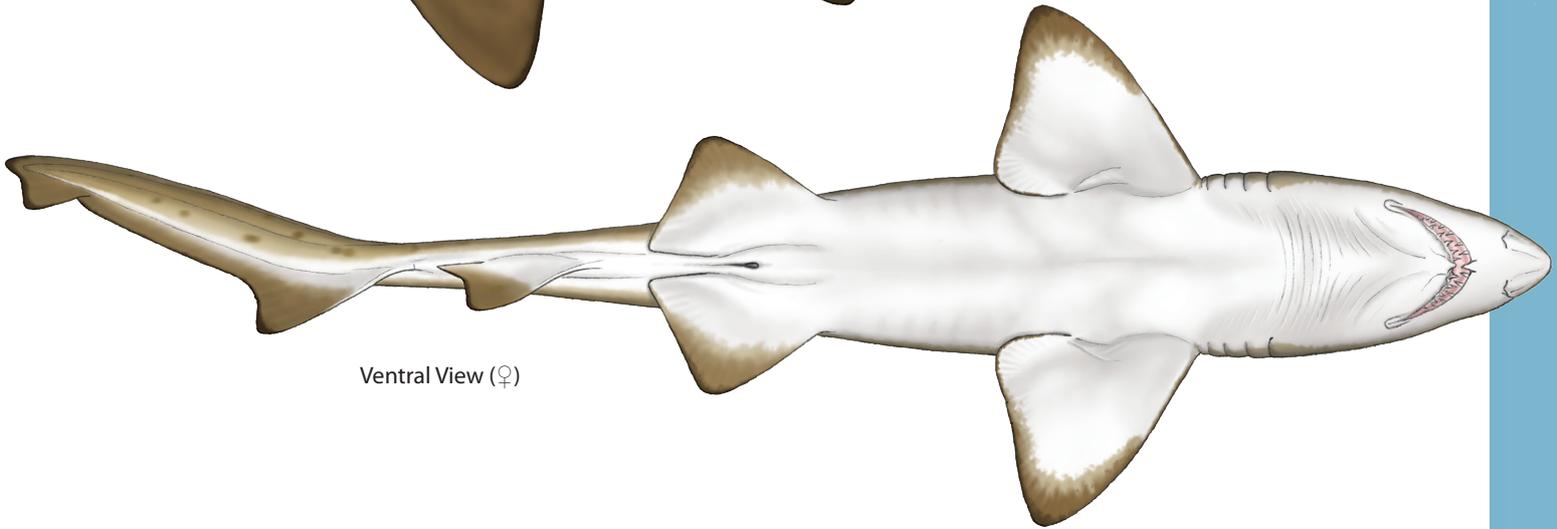
## REFERENCES

- Compagno, L. J. V.; 1984. FAO.
- Knickle, C; Unknown. FLMNH.
- Musick, J. A. *et al*; 2007. IUCN Red List.

Lateral View (♀)



Ventral View (♀)



### SYNONYMS

*Eugomphodus taurus* (Rafinesque, 1810), *Squalus americanus* (Mitchell, 1815), *Squalus macrodous* (Mitchell, 1818), *Squalus littoralis* (Le Sueur, 1818), *Carcharhinus griseus* (Ayres, 1842), *Odontaspis americanus* (Abbott, 1861), *Carcharias tricuspidatus* (Day, 1878), *Odontaspis cinerea* (Macleay, in Ramsay, 1880), *Carcharias cuspidatus* (Ogilby, 1888), *Lamna ecarinata* (Hemprich & Ehrenberg, 1899), *Carcharias arenarius* (Ogilby, 1911), *Carcharias owstoni* (Garman, 1913), *Squalus lixa* (Larrañaga, 1923), *Odontaspis platensis* (Lahille, 1928), *Odontaspis tricuspidatus* (Fang & Wang, 1932).

### DISTRIBUTION



*Carcharias taurus* is found almost worldwide in tropical and warm temperate waters, with the exception of the eastern Pacific. Its distribution in the east Atlantic is patchy but stretches from the Mediterranean Sea to Cameroon (Compagno, L, J, V; 2001).

### COMMON NAMES

**Sandtiger Shark**, Grey Nurse Shark, Raggedtooth Shark, Slender-tooth Shark, Spotted Sandtiger Shark, Ground Shark, Sand Shark, Requin Taureau (Fr), Toro Bacota (Es).

### APPEARANCE

- Flattened, conical snout.
- Mouth long, extending behind eyes.
- Both dorsal fins and anal fin equally large and broad-based.
- First dorsal fin closer to pelvic fins than pectoral fins.
- No lateral caudal keels but upper precaudal pit present.
- Caudal fin asymmetrical but with a long ventral lobe.
- Light brown or light greenish-grey dorsally.
- Greyish white ventrally.
- May have scattered darker reddish or brown spots.

A large species reaching at least 318cm total length (possibly to 430cm), the Sandtiger Shark is similar in appearance to the Smalltooth Sandtiger Shark, *Odontaspis ferox*. It has a flattened, conical snout with a long mouth extending behind the eyes. Both dorsal fins and the anal fin are equally large and broad based. The first dorsal fin is closer to the pelvic fins than the pectoral fins. There are no lateral caudal keels but an upper precaudal pit is present. The caudal fin is asymmetrical but with a strong ventral lobe (Compagno, 2001).

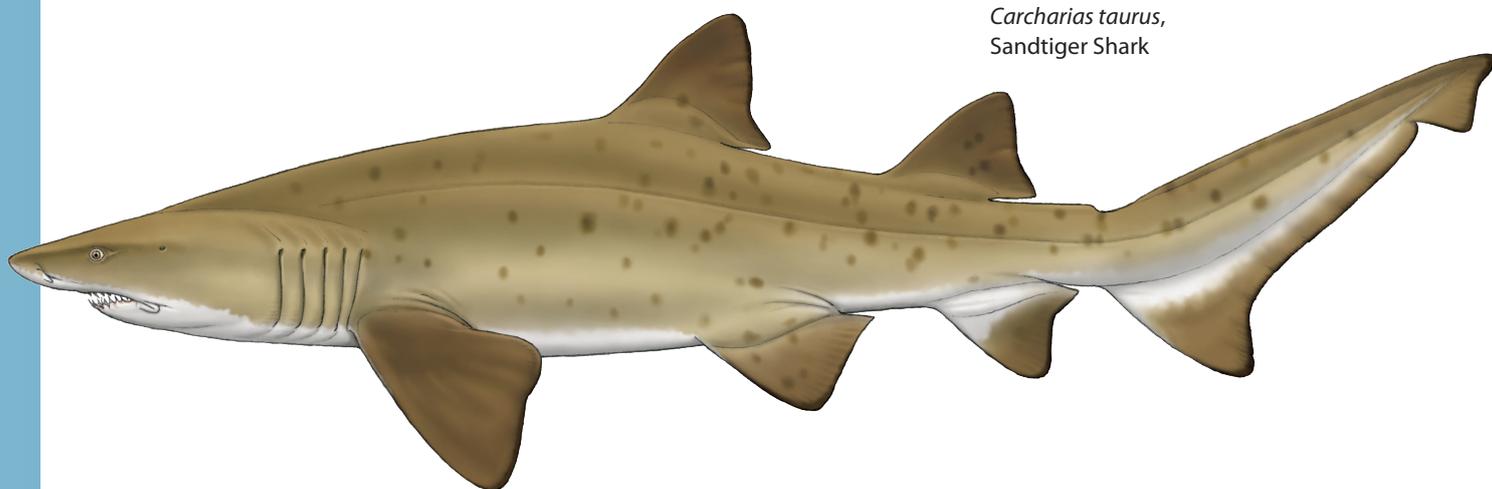
The dorsal colouration is light brown to greenish-grey, fading to greyish white ventrally. Some individuals may have darker red or brown spots scattered across the body (Cooper, Unknown).



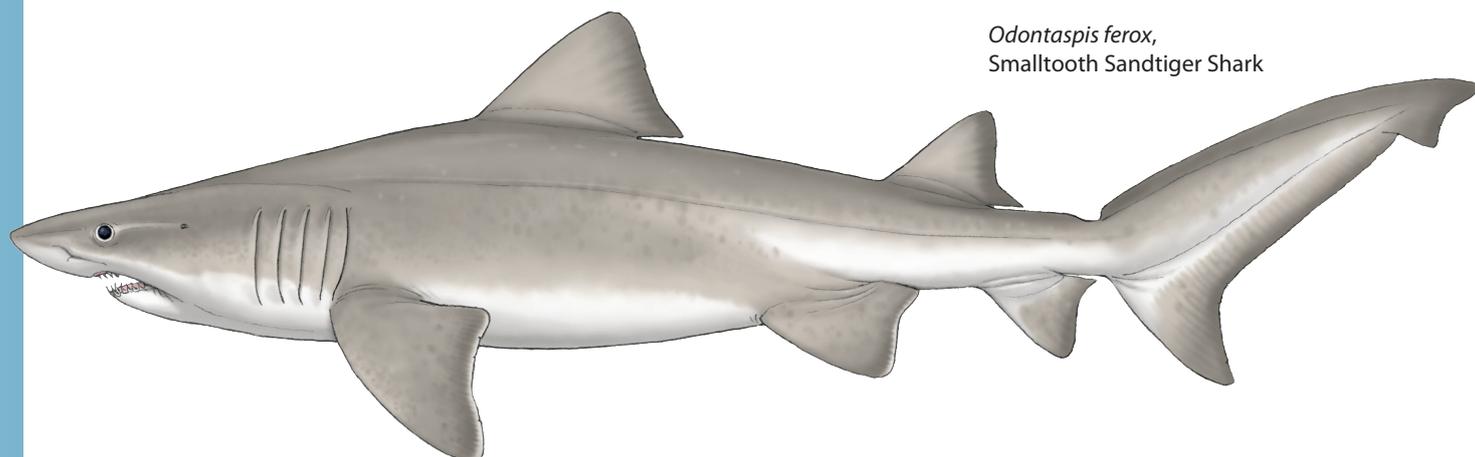
## SIMILAR SPECIES

*Odontaspis ferox*, Smalltooth Sandtiger Shark

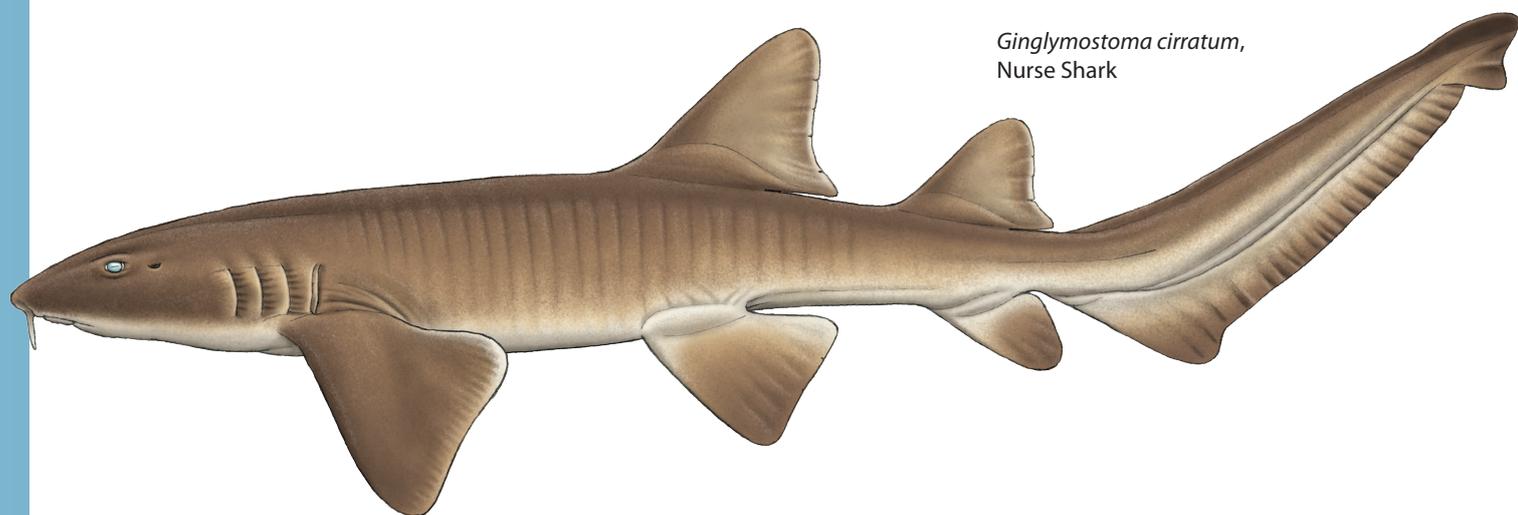
*Ginglymostoma cirratum*, Nurse Shark



*Carcharias taurus*,  
Sandtiger Shark



*Odontaspis ferox*,  
Smalltooth Sandtiger Shark

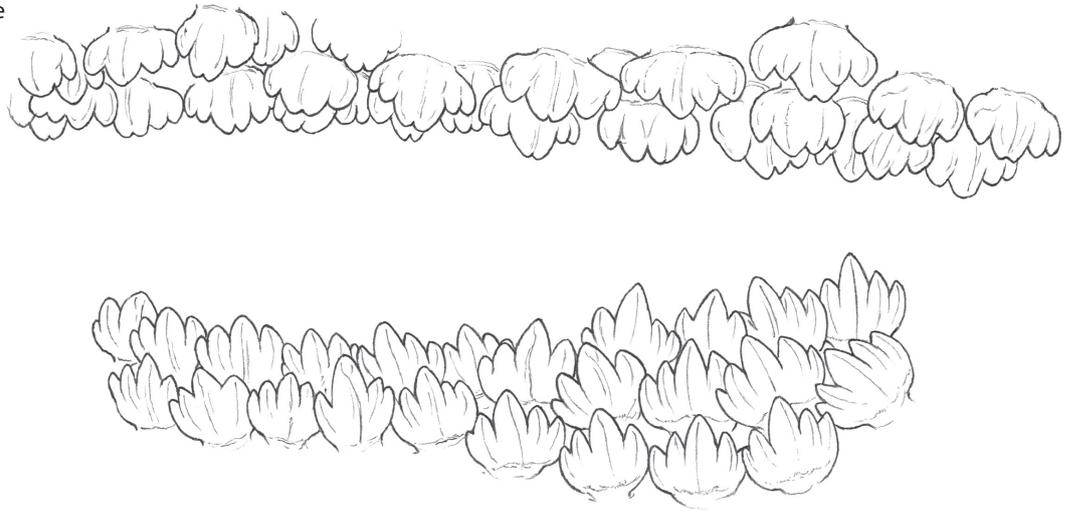


*Ginglymostoma cirratum*,  
Nurse Shark

(Not to scale)

### TEETH

The teeth have prominent cusps with lateral cusplets. The front teeth of the upper jaw are separated from the rear teeth by small intermediate teeth. There are 44–48 upper teeth and 41–46 lower teeth (Cooper, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Sandtiger Shark is an inshore species found to at least 190m around the surf zone, shallow bays, coral and rocky reefs and deeper areas around the outer continental shelves. It is predominantly demersal but can be seen throughout the water column. Migratory, it is known to move towards the poles during the warmer months and back towards the equator during cooler months (Cooper, Unknown).

#### DIET

The Sandtiger Shark feeds on a vast array of bony fish, listed by Compagno (2001) as herring (Clupidae), anchovies (Engraulidae), hake (Merluccidae), eels (Anguillidae), monkfish or anglers (Lophidae), cusk eels (Ophidiidae), lizardfish (Synodontidae), sea catfish (Ariidae), croakers (Sciaenidae), Australian salmon (Arripidae), morwong (Cheilodactylidae), rock blackfish or opaleyes (Girellidae), bluefish, elf or taylor (Pomatomidae), mackerel and bonito (Scombridae), butterfishes (Stromateidae), snappers (Lutjanidae), wrasses (Labridae), mullet (Mugilidae), spadefish (Chaetodipteridae), sea robins (Triglidae), flatheads (Platycephalidae), duckbills (Percophidae), midshipmen (Batrachodidae), sea basses (Serranidae), porgies or sea breams (Sparidae), jacks (Carangidae), remoras (Echeneidae), flatfish (Pleuronctiformes) including soles (Soleidae), American soles (Achiridae), Atlantic flounders (Scophthalmidae), righteye flounders (Paralichthyidae) and undoubtedly many others (Compagno, 2001).

Elasmobranch prey is listed as including requiem sharks (Carcharinidae), houndsharks (Triakidae), angel sharks (Squatinae), skates (Rajidae), eagle rays (*Aetobatus* and *Myliobatis*, Myliobatidae) and Rajidae eggcases. Invertebrate prey includes squid (Loliganidae), crabs, lobsters and hermit crabs (Paguridae). Pinniped remains have also been recorded and wounds attributable to the species have been found on Franciscana Dolphins (*Pontoporia blainvillei*). Plant material has also been recorded, presumably ingested whilst feeding on other prey items (Compagno, 2001).

Schools of Sandtiger Sharks have been observed hunting cooperatively, surrounding schooling fishes and bunching them together to make feeding easier. They may also use tail slapping behaviour to scare prey (Compagno, 2001).

#### REPRODUCTION

Female Sandtiger Sharks mature at a total length of around 220cm and around 6 years of age. Males mature smaller and earlier at 90–195cm and 4–5 years of age. It is an ovoviparous species with a gestation period of 8–9 months (Compagno, 2001). Like other lamnoids, the embryos are initially nourished by a yolk-sac and, once this is depleted, by unfertilised eggs constantly deposited in the uteri. Between these stages however, the embryos have a unique method of feeding (Martin, Unknown). At around 17cm they have fully functional teeth and at 26cm they are able to move around in the uterus (Compagno, 2001). The largest embryo in each uterus then kills and eats its siblings. This results in litters of only 2 pups (one from each uterus) measuring around 100cm in length and already experienced hunters (Martin, Unknown).

## COMMERCIAL IMPORTANCE

The Sandtiger Shark is commercially important across much of its range. In the northern Pacific Ocean, northern Indian Ocean and tropical West Africa it is fished for food using handlines and gillnets. Elsewhere it is taken as bycatch in line and net fisheries. The flesh is used fresh or preserved for human consumption, its fins for sharkfin soup, its hide for leather, its liver is rendered for oil and its carcass can be processed or fishmeal (Compagno, 2001). The jaws and teeth are also valuable as curios and ornaments (Cooper, Unknown).

The Sandtiger Shark is a common aquarium species due to its hardy nature, large size and ferocious appearance. If properly cared for in a suitable tank it can live for many years. It is the only viviparous, aplacental elasmobranch species which employs a form of intrauterine cannibalism to mate in captivity (Henningesen *et al.*, 2004). The species also inhabits coastal areas and popular dive sites such as shipwrecks where it is sought by recreational divers. It is occasionally taken by recreational anglers fishing from the shore, although many of these are returned alive (Cooper, Unknown).

## THREATS, CONSERVATION, LEGISLATION

The Sandtiger Shark is classified in the IUCN Red List as vulnerable, meaning that populations have declined by at least 20% over 10 years or 3 generations, its population is fragmented and that its probability of becoming extinct in the wild in the next 100 years is at least 10% (Pollard and Smith, 2000). It is currently a prohibited species in the longline shark fishery off the east coast of the USA, meaning it must be immediately released if caught with minimal harm to the shark. Declines have been observed off Australia and South Africa because of commercial and recreational fishing and beach meshing. Now a protected species off Australia, recovery is proving very slow (Pollard and Smith, 2000).

## IUCN RED LIST ASSESSMENT

Vulnerable (2000).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

### REFERENCES

- COMPAGNO, L. J. V. 2001. Sharks of the World: An Annotated and Illustrated Catalogue of Shark Species Known to Date. Volume 2. Bullhead, Mackerel and Carpet Sharks (Heterodontiformes, Lamniformes and Orectolobiformes). FAO. Rome, Italy.
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Text: Richard Hurst.  
Illustrations: Marc Dando.

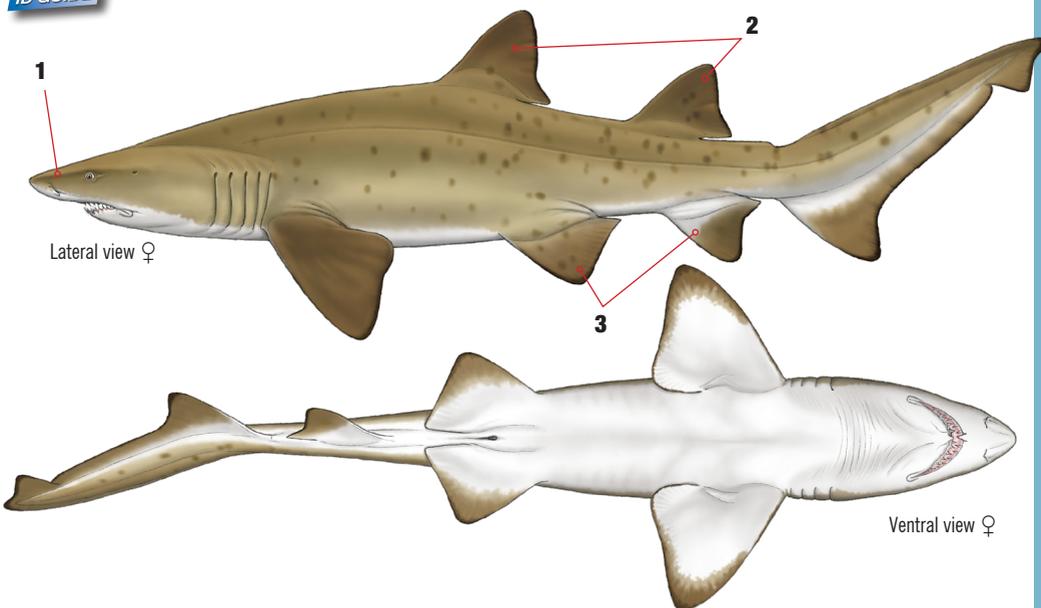
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Lateral view ♀

Ventral view ♀

### SCIENTIFIC NAME

*Carcharias taurus* (Rafinesque, 1810).

### DISTRIBUTION

Virtually circumglobal. Patchy in east Atlantic from Gibraltar to South Africa, including the Mediterranean<sup>i</sup>.



### COMMON NAME

**SANDTIGER SHARK**, Grey Nurse Shark, Raggedtooth Shark, Slender-tooth Shark, Spotted Sandtiger Shark, Ground Shark, Sand Shark, Requin Taureau (Fr), Toro Bacota (Es).

### IDENTIFICATION

- 1 Flattened, conical snout.
- 2 Dorsal fins similar in size.
- 3 Large pelvic and anal fins<sup>i</sup>.

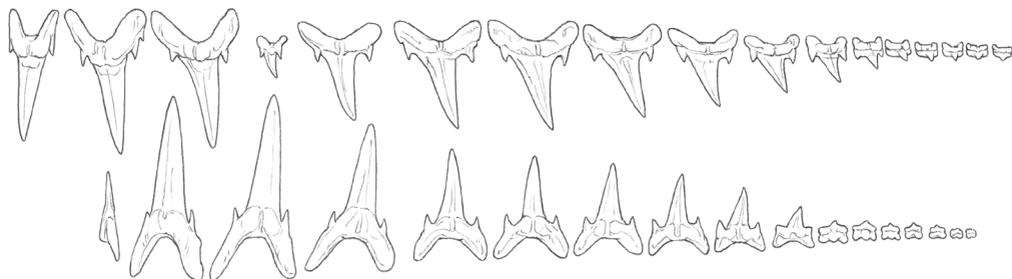
### COLOUR

- Light grey/brown dorsally.
- Grey white ventrally.
- Often darker red/brown blotches scattered across body<sup>ii</sup>.

### BIOLOGY AND SIZE

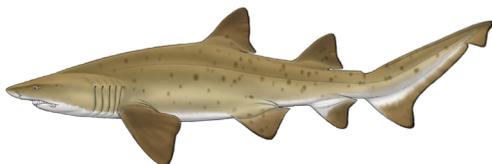
- Born: 95–105cm. Mature: ~220cm ♀, 190–195cm ♂. Max TL: >430cm<sup>i</sup>.
- Embryos are nourished by a yolk-sac, oophagy and later embryophagy, the latter unique to the species.
- Gives birth to two pups every other year, one from each uterus.
- Feeds on a wide variety of bony fish, elasmobranchs and crustaceans. Has been observed feeding cooperatively.

## TEETH

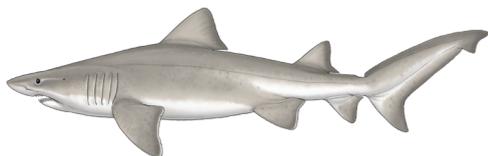


- ◉ Narrow cusps with lateral cusplets in both jaws.
- ◉ Numerous small teeth in corners of mouth.
- ◉ 44–48 uppers, 41–46 lowers<sup>ii</sup>.

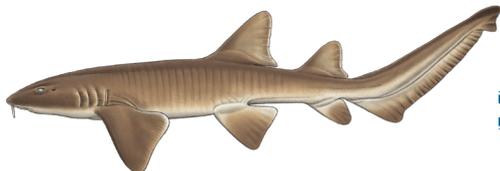
## SIMILAR SPECIES



- ◉ *Carcharias taurus*, Sandtiger Shark



- ◉ *Odontaspis ferox*, Smalltooth Sandtiger Shark



- ◉ *Ginglymostoma cirratum*, Nurse Shark

## HABITAT

- ◉ Usually demersal to at least 191m, most common 15–25m.
- ◉ Can be found in large aggregations, up to 80 individuals.
- ◉ Can control its buoyancy through swallowing air, a rarely observed behaviour.
- ◉ Strongly migratory in the extreme north and south of its range, moving polewards during the warmer months<sup>i</sup>.

## CONSERVATION STATUS

- ◉ One of the lowest reproductive rates of any elasmobranch with isolated regional populations. Steep declines have been observed across its range. Now protected in some areas but recovery is slow<sup>iii</sup>.
- ◉ **Red List status:** Vulnerable (2000).

## COMMERCIAL IMPORTANCE

- ◉ Taken by longline, handline and trawl fisheries across its range.
- ◉ Utilised for food in the North Pacific, northern Indian Ocean and West Africa. Fins, liver and hide also used.
- ◉ Popular aquarium species due to docile and hardy nature. Sought by recreational divers<sup>ii</sup>.

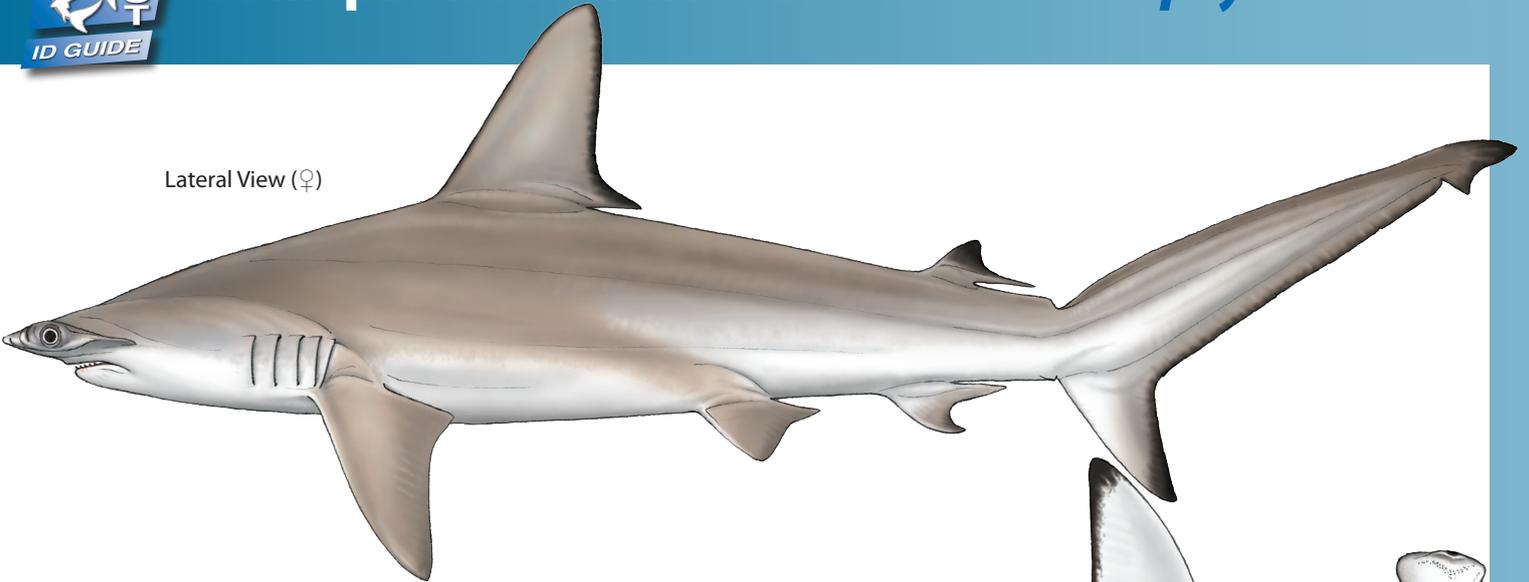
## HANDLING

- ◉ Handle with care.
- ◉ Sharp teeth.
- ◉ Abrasive skin.

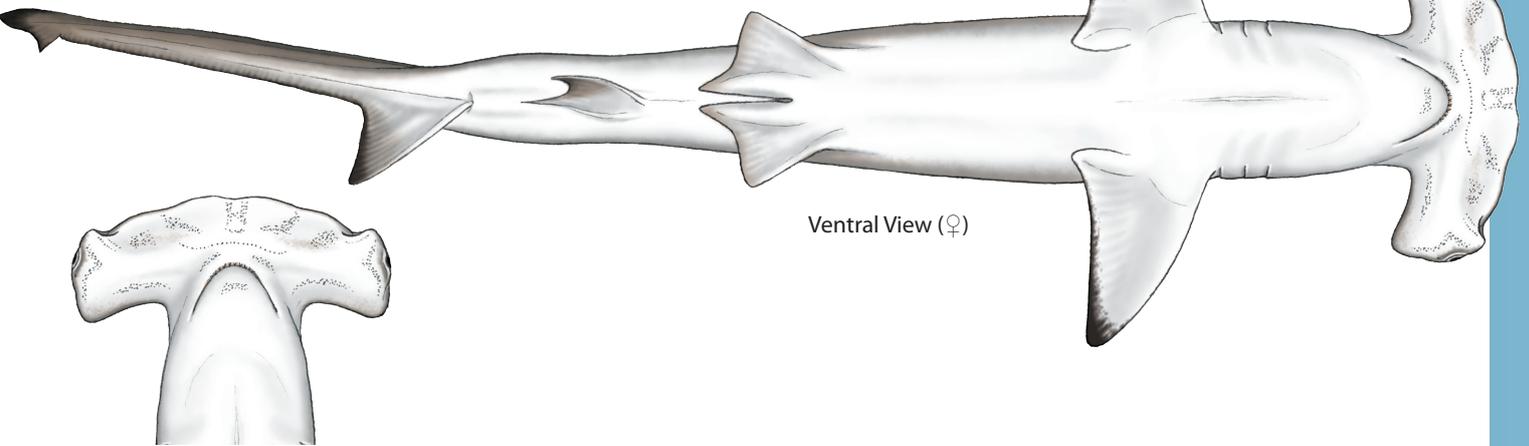
## REFERENCES

- i. Compagno, L. J. V. *et al*; 2005. HarperCollins Publishers.
- ii. Cooper, P; Unknown. FLMNH.
- iii. Pollard, D. *et al*; 2000. IUCN Red List.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Scalloped Hammerhead Shark**, Bronze Hammerhead, Kidney-Headed Shark, Southern Hammerhead, Requin-Marteau Halicorne (Fr), Cornuda Común (Es).

### SYNONYMS

*Zygaena malleus* (Valenciennes, 1822), *Zygaena indica* (van Hasselt, 1823), *Zygaena lewini* (Griffith & Smith, 1834), *Cestracion leeuwenii* (Day, 1865), *Zygaena erythraea* (Hemprich & Ehrenberg, 1899), *Cestracion oceanica* (Garman, 1913), *Sphyrna diplana* (Springer, 1941).

### DISTRIBUTION



The Scalloped Hammerhead Shark is a virtually circumglobal species in tropical and warm temperate coastal waters. In the east Atlantic it is known from the Mediterranean to Senegal and Zaire (Compagno, 1984).

### APPEARANCE

- Broad, narrow-bladed cephalophoil.
- Anterior margin of the head with prominent median indentation.
- First dorsal fin originates over or behind pectoral fin origins.
- Small second dorsal and anal fins with long free rear tips.
- Non-falcate pelvic fins.
- Deeply notched posterior anal margin.
- Brownish grey to bronze or olive dorsolaterally.
- Pale yellow or white ventrally.
- Dark pectoral, lower caudal and second dorsal fin tips in juveniles.
- Adults may have dusky pectoral fin tips.

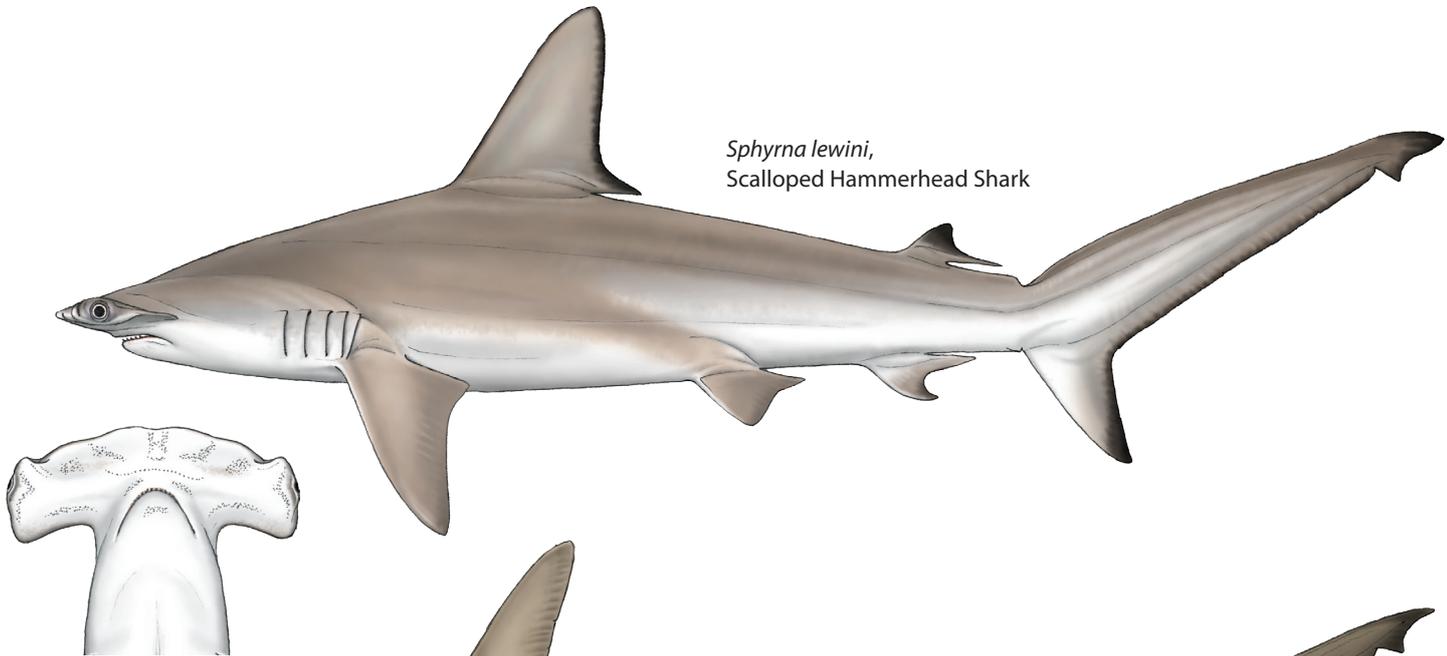
The most distinctive feature of the Scalloped Hammerhead Shark is the prominent median indentation on the leading edge of the cephalophoil. It is distinguished from the Great Hammerhead Shark, *Sphyrna mokarran*, by the shallower indentations halfway between the median indentation and the edge of the head and also by the smaller first dorsal fin. This first dorsal fin is moderately falcate and originates over or slightly behind the pectoral fin bases. The pelvic fins are non-falcate. The second dorsal and anal fins have long free rear tips, on the second dorsal fin this nearly reaches the upper caudal origin. The posterior anal margin is deeply notched (Compagno, 1984).

Dorsolaterally it is brownish grey to bronze or olive, ventrally it is pale yellow to white. Juveniles have dark tips to the pectoral, lower caudal and second dorsal fin tips. Adults may have dusky tips to the pectoral fins (Bester, Unknown).

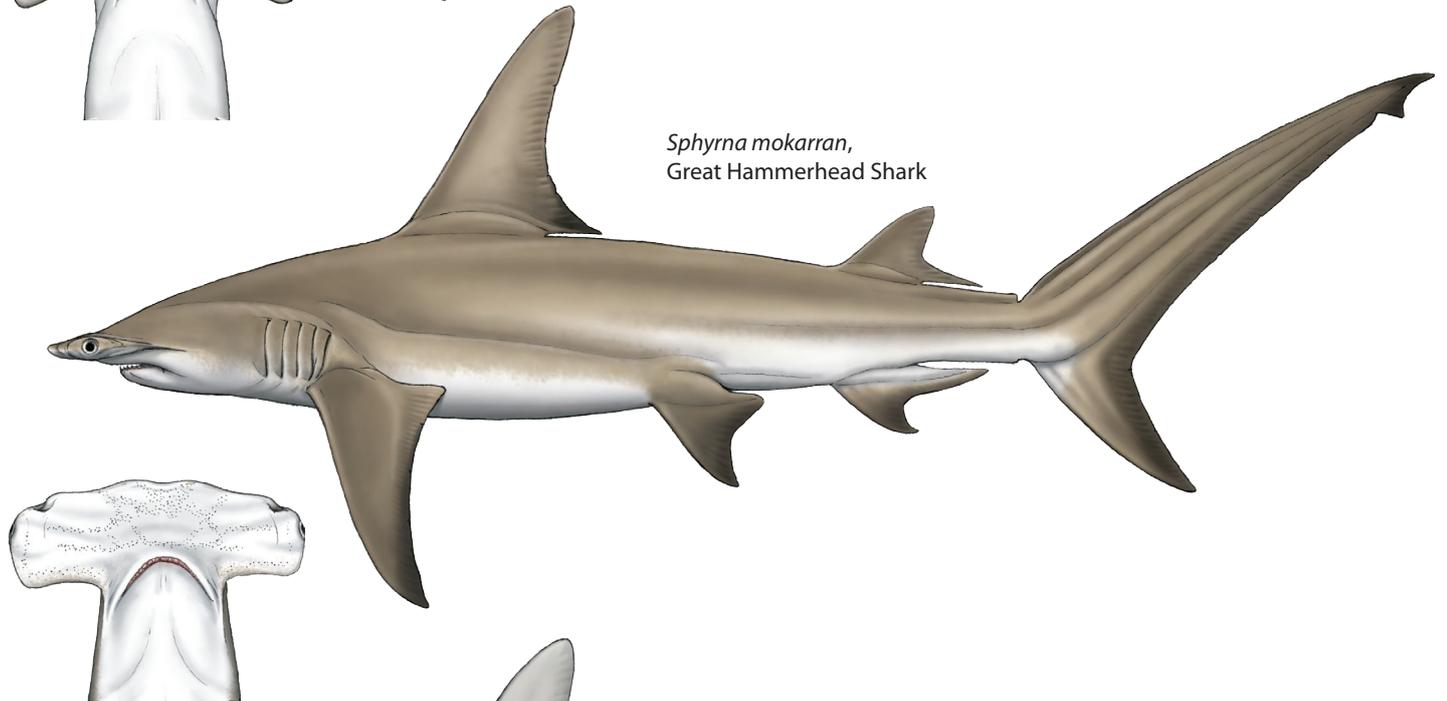
## SIMILAR SPECIES

*Sphyrna mokarran*, Great Hammerhead Shark

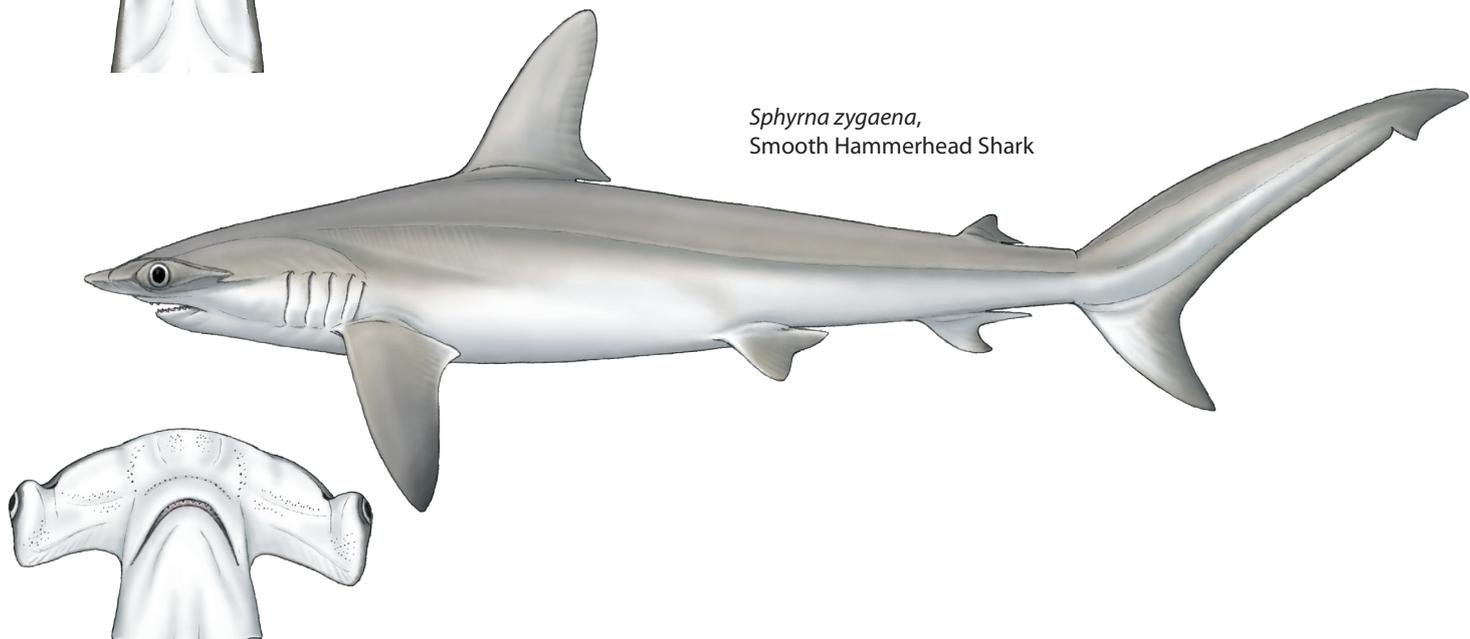
*Sphyrna zygaena*, Smooth Hammerhead Shark



*Sphyrna lewini*,  
Scalloped Hammerhead Shark



*Sphyrna mokarran*,  
Great Hammerhead Shark

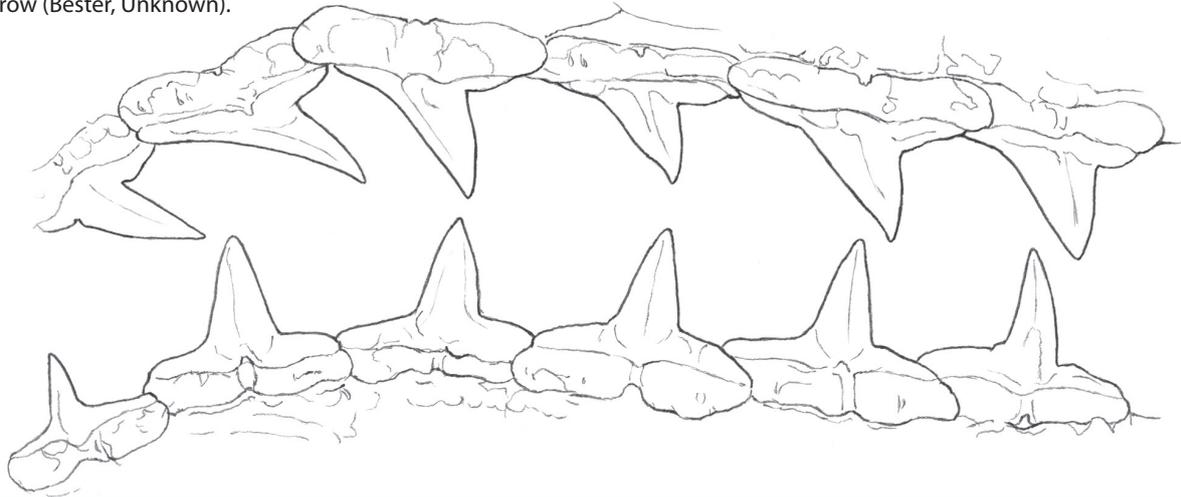


*Sphyrna zygaena*,  
Smooth Hammerhead Shark

(Not to scale)

### TEETH

The teeth are small with large bases, smooth or finely serrated. The uppers are narrow and triangular, becoming increasingly oblique towards the corners of the mouth. The lowers are more erect and narrow (Bester, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Scalloped Hammerhead Shark occurs over continental and insular shelves from the surface to at least 275m. It has been observed close inshore and is known to enter estuarine habitats. Adults can occur singly, in pairs or in small groups while young sharks are known live in large schools. Schools of small Scalloped Hammerhead Sharks have been observed migrating towards the poles during the warmer months and returning when the water cools. In other areas such as the East China Sea, resident populations exist. It is thought that these schools segregate by sex, during certain times and certain places at least (Bester, Unknown).

#### EGGCASE

N/A

#### DIET

Primarily a piscivore, the Scalloped Hammerhead Shark also takes a wide variety of invertebrates. Known food items include sardines and herring, anchovies, ten-pounders, conger eels, milkfish, sea catfish, silversides, halfbeaks, mullet, lizardfish, barracuda, bluefish, mackerel, jacks, porgies, mojarras, cardinal fishes, goatfish, grunts, damselfishes, parrotfishes, wrasses, butterfly fishes, surgeonfish, gobies, flatfish, sharpnose sharks (*Rhizoprionodon* spp.), the Blacktip Reef Shark (*Carcharhinus melanopterus*), angelsharks (*Squatina* spp.), stingrays, squid, octopi, cuttlefishes, sea snails, shrimp, mantis shrimp, crabs, lobsters and isopods (Compagno, 1984).

#### REPRODUCTION

Female Scalloped Hammerhead Sharks mature at a total length of around 250cm, males smaller at around 180cm. During the 9–10 month gestation period the embryos are nourished through a yolk-sac placenta. Parturition occurs during the summer months with litters of 12–38 pups produced, each measuring 38–45cm total length. These pups initially tend to stay in inshore nursery grounds, the best studied being Kaneohe Bay, Oahu, Hawaii (Bester, Unknown).

## COMMERCIAL IMPORTANCE

The Scalloped Hammerhead Shark is taken on pelagic longlines, fixed bottom longlines, fixed bottom nets and bottom and pelagic trawls. Its meat is utilised fresh and preserved for human consumption, its fins are used for sharkfin soup, its hide can be used for leather, its liver oil can be used for vitamins and its carcass can be processed for fishmeal (Kotas, 2000).

## THREATS, CONSERVATION, LEGISLATION

Due to its large size, coastal habitat and habit of forming large aggregations, the Scalloped Hammerhead Shark is extremely vulnerable to fisheries pressure. The shallow water nursery grounds used by this species are often heavily exploited by inshore fisheries and are vulnerable to pollution and habitat destruction. Because of the high fin ray count in hammerhead fins, they are prized in the sharkfin market and all hammerhead species are targeted where they aggregate. In several areas of its range such as South Africa, the northwest and western central Atlantic and Brazil, declines of 50-90% have been recorded over 25 years. Similar declines are inferred across much of its range. Because of its habit of forming large groups, huge declines could occur in the population while fisheries remained profitable by targeting known aggregation areas (Gibson *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Endangered (2008).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth and powerful jaws.
- Abrasive skin.

### REFERENCES

- BESTER, C. Unknown. Scalloped Hammerhead. Florida Museum of Natural History. [www.flmnh.ufl.edu/fish/](http://www.flmnh.ufl.edu/fish/).
- COMPAGNO, L. J. V. 1984. FAO Species Catalogue, Vol. 4, Part 1: Sharks of the World. An Annotated and Illustrated Catalogue of Shark Species Known to Date. FAO. Rome, Italy.
- GIBSON, C., VALENTI, S. V., FOWLER, S. L., FORDHAM, S. V. 2006. The Conservation Status of Northeast Atlantic Chondrichthyans: Report of the IUCN Shark Specialist Group Northeast Atlantic Regional Red List Workshop. Peterborough, UK.
- KOTAS, J. E. 2000. *Sphyrna lewini*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.1. [www.iucnredlist.org](http://www.iucnredlist.org).

Text: Richard Hurst.  
Illustrations: Marc Dando.

#### Citation

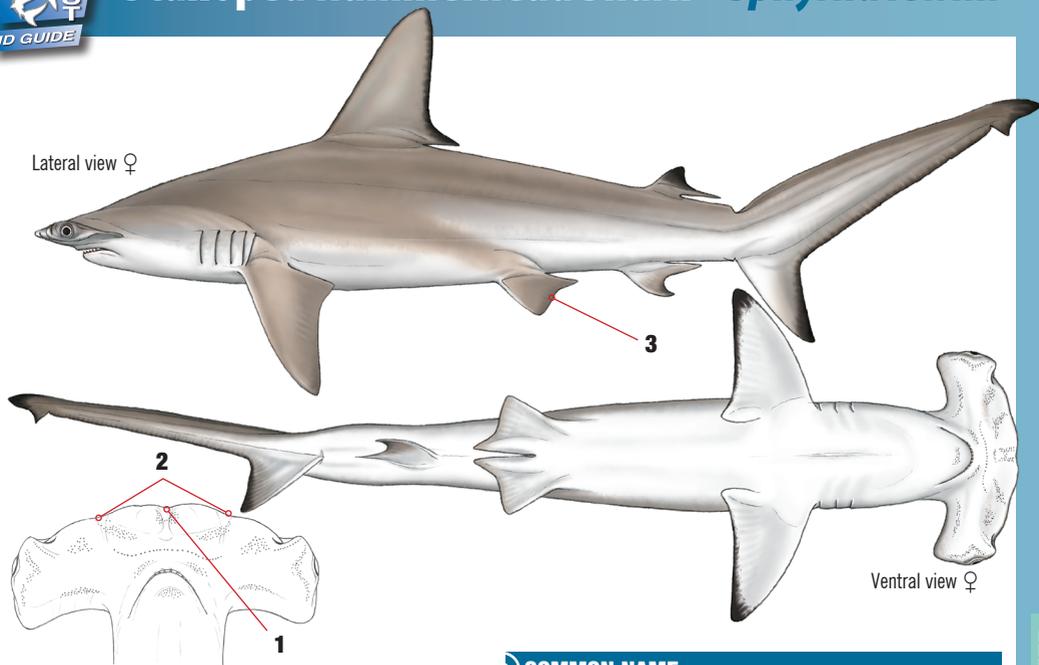
Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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# Scalloped Hammerhead Shark *Sphyrna lewini*



Lateral view ♀

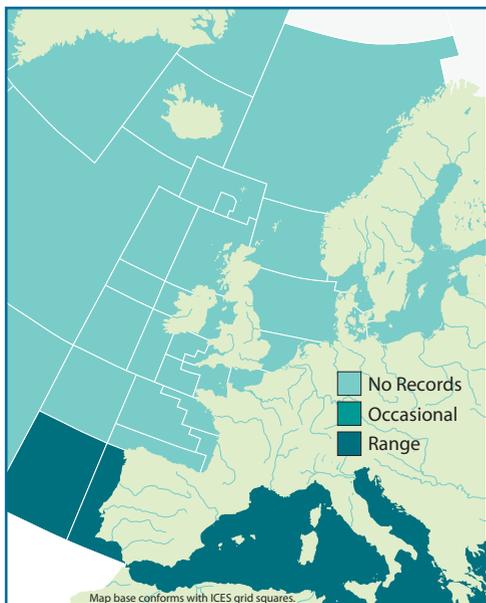
Ventral view ♀

## SCIENTIFIC NAME

*Sphyrna lewini* (Griffith & Smith, 1834)

## DISTRIBUTION

Circumglobal in coastal warm temperate and tropical waters. East Atlantic from the Mediterranean Sea to Namibia<sup>ii</sup>.



## COMMON NAME

**SCALLOPED HAMMERHEAD SHARK**, Bronze Hammerhead Shark, Kidney-Headed Shark, Southern Hammerhead Shark, Requin-Marteau Halicorne (Fr), Cornuda Común (Es).

## IDENTIFICATION

- 1 Prominent median indentation on cephalophoiil.
- 2 Two more indentations each side of median.
- 3 Rear margins of pelvic fins relatively straight<sup>ii</sup>.

## COLOUR

- Brown/grey to bronze or olive dorsally.
- Pale yellow or white ventrally.
- Adults have dark pectoral fin tips.
- Juveniles also have dark lower caudal and second dorsal fin tips<sup>i</sup>.

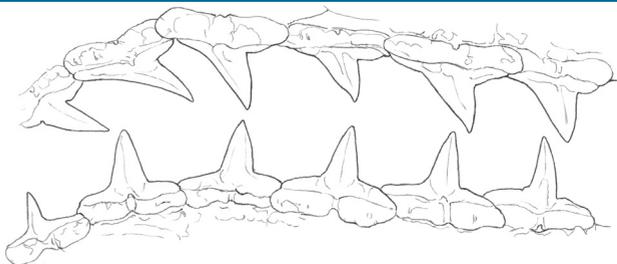
## BIOLOGY AND SIZE

- Born: 31–57cm. Mature: 210–250cm ♀, 140–198cm ♂. Max TL: 296–340cm ♀, 219–340cm ♂<sup>ii</sup>.
- 12–41 pups per litter have been recorded. Give birth in inshore nursery areas after a gestation period of 9 - 12 months<sup>iii</sup>.
- Feed predominantly on teleost and elasmobranch fish. Cephalopods, molluscs and crustaceans have also been recorded<sup>i</sup>.

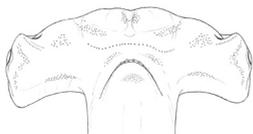
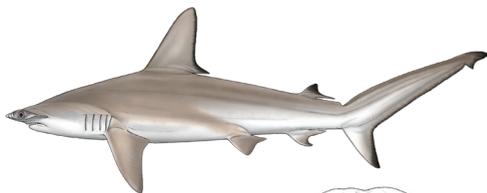


## TEETH

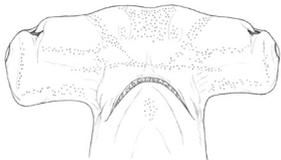
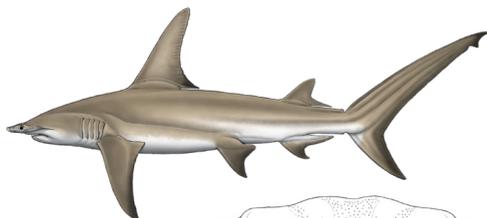
- Small with large bases. Smooth or finely serrated.
- Uppers narrow and triangular, increasingly oblique towards the corner of the mouth.
- Lowers more erect and narrow<sup>i</sup>.



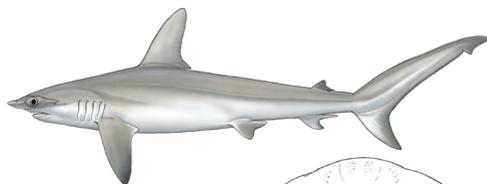
## SIMILAR SPECIES



- Sphyrna lewini*, **Scalloped Hammerhead Shark**



- Sphyrna mokarran*, **Great Hammerhead Shark**



- Sphyrna zygaena*, **Smooth Hammerhead Shark**

## HABITAT

- Intertidal to at least 275m. Known to enter enclosed bays and estuaries but not thought to enter freshwater.
- A highly mobile species. Adults can be found singly, in pairs or in small groups. Juveniles known to form huge schools.
- Migrate polewards during the warmer months in some areas, particularly juveniles. Segregation by sex has also been reported<sup>ii</sup>.

## CONSERVATION STATUS

- Commonly taken by fisheries. Pups occupy inshore nursery grounds, often heavily exploited by fisheries and vulnerable to habitat degradation<sup>iii</sup>.
- Red List status:** Endangered (2008).

## COMMERCIAL IMPORTANCE

- Taken by longlines, fixed bottom-nets and trawls. Popular game fish, particularly off the east coast of the USA and off southeast Australia.
- Primarily a bycatch species but high value of fins means few are returned alive if caught.
- Meat is utilised fresh and preserved for human consumption. Hides are used for leather, livers for vitamins and carcasses for fishmeal<sup>iii</sup>.

## HANDLING

- Handle with care.
- Sharp teeth and powerful jaws.
- Abrasive skin.

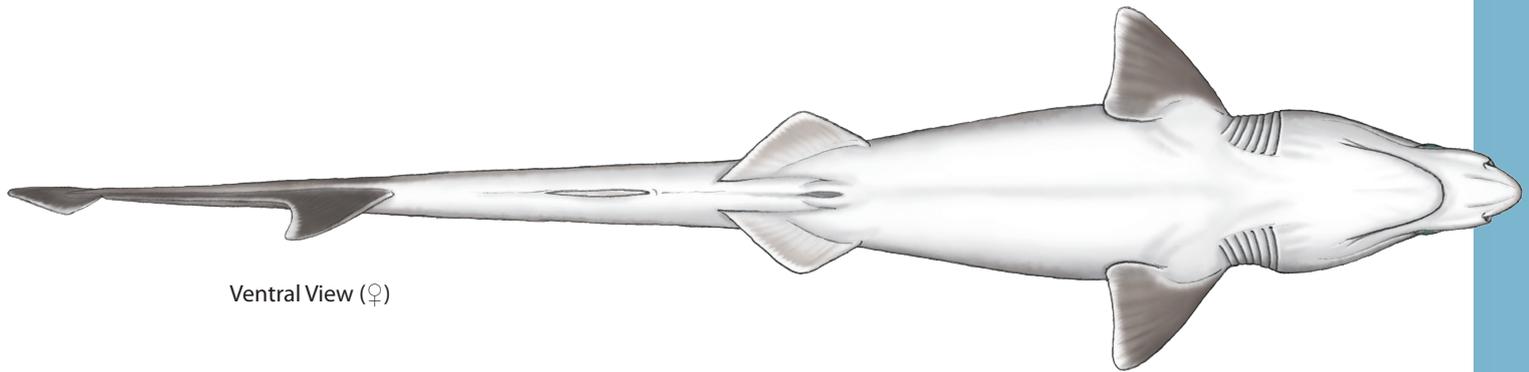
## REFERENCES

- Bester, C; Unknown. FLMNH.
- Compagno, L. J. V; 1984. FAO.
- Kotas, J. E; 2000. IUCN Red List.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

Sharpnose Sevengill Shark, One-Finned Shark, Perlon Shark, Sevengill Cow Shark, Sevengilled Mediterranean Shark, Snouted Sevengill Shark, Slender Sevengill Shark, Requin Perlon (Fr), Cañabota Bocadulce (Es).

### SYNONYMS

*Heptranchias cinereus* (Gmelin 1789), *Squalus cinereus* (Gmelin 1789), *Notidanus cinereus* (Gmelin 1789), *Heptrancus angio* (Costa 1857), *Heptranchias angio* (Costa 1857), *Notidanus cinereus aetatis* (Bellotti 1878), *Notidanus cinereus pristiurus* (Bellotti 1878), *Heptranchias deani* (Jordan & Starks 1901), *Heptranchias dakini* (Whitley 1931).

### DISTRIBUTION



An extremely wide ranging species in tropical and temperate seas, absent only from the eastern North Pacific. It has only been recorded in British waters twice, once from southern Cornwall and once from southern Ireland (Henderson and Williams, 2001).

### APPEARANCE

- Moderately small shark with a slender body and a sharply pointed snout.
- Seven gill slits, unique in the northeast Atlantic.
- Single dorsal fin with straight or slightly convex leading edge set behind the pelvic fins.
- Small, weakly curved pectoral fins.
- Small pelvic fins and anal fin.
- Long dorsal lobe of caudal fin, ventral lobe with strong sub terminal notch.
- Brown-grey colouration on the dorsal surface.
- Lighter ventrally.
- Fins may have paler posterior margins.
- Juveniles have dark blotches, present but faded in adults.

A very distinctive species, the Sharpnose Sevengill Shark is slender and streamline with a sharply pointed snout. On the sides of the head there are seven large gills, a feature unique in the northeast Atlantic. It has large eyes which are bright green in live specimens. Underneath the snout the mouth is long and narrow containing distinctive teeth (Bester, Unknown).

There is only one dorsal fin which is small and set well back on the body behind the pelvic fins. The pectoral fins are small and weakly curved. The pelvic and anal fins are also tiny. The caudal fin has an enlarged upper lobe with a strong terminal lobe. The ventral lobe has a large terminal notch (Bester, Unknown).

Dorsally the colour can vary from grey to olive brown. The posterior margins of the fins can be pale. There is normally a pattern of faint, dark blotches. Juveniles have much stronger dark margins. Ventrally it is paler to white (Bester, Unknown).

## SIMILAR SPECIES

*Hexanchus griseus*, Bluntnose Sixgill Shark

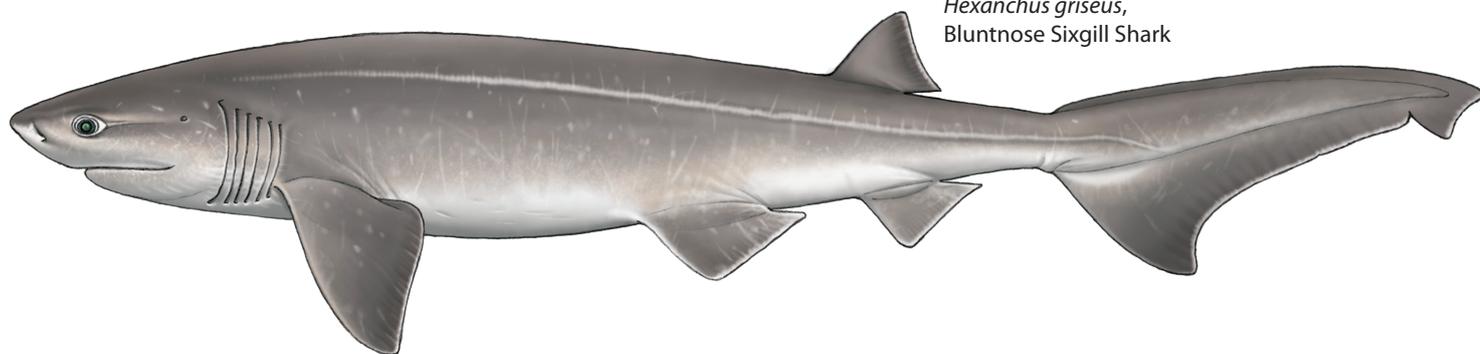
*Hexanchus nakamurai*, Bigeye Sixgill Shark

*Chlamydoselachus anguineus*, Fridged Shark

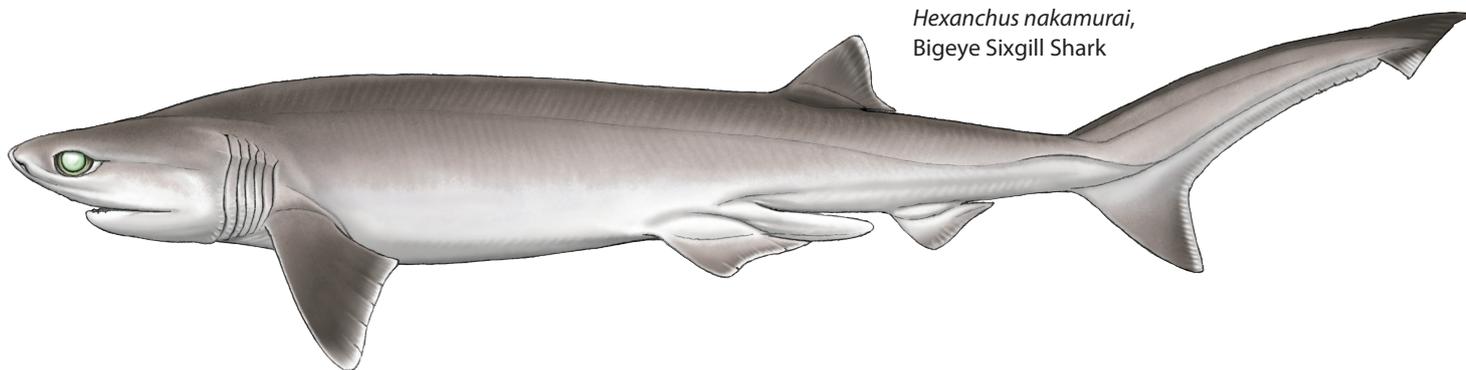
*Heptranchias perlo*,  
Sharpnose Sevengill Shark



*Hexanchus griseus*,  
Bluntnose Sixgill Shark



*Hexanchus nakamurai*,  
Bigeye Sixgill Shark



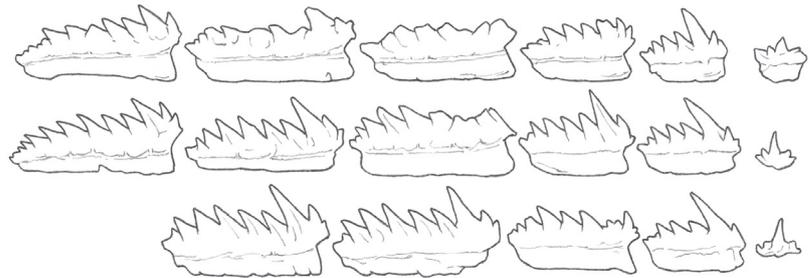
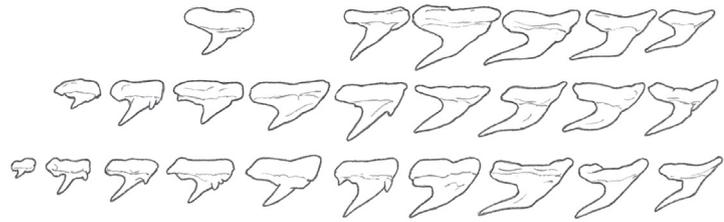
*Chlamydoselachus anguineus*,  
Fridged Shark



(Not to scale)

### TEETH

The first three or four teeth in the upper jaw are narrow with a hook-like cusp and small lateral cusps. All the subsequent teeth have one or two small cusps. The teeth in the lower jaw are broad and comb-shaped with the exception of a small symmetrical tooth at the symphysis. There are 9-11 teeth on each side of the upper jaw and five teeth each side of the symphyseal tooth in the lower jaw (Bester, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

A deepwater species, the Sharpnose Sevengill Shark is usually found on or near the bottom to 1,000m. However, it has been recorded in open water as shallow as 27m (Bester, Unknown). It is most commonly taken between 300 and 600m with possible aggregations around features such as seamounts (Paul and Fowler, 2003).

#### EGGCASE

N/A

### DIET

The Sharpnose Sevengill Shark is a voracious generalist predator known to feed on a wide variety of prey. These include marine invertebrates such as shrimp, crabs, lobsters, squid and cuttlefish, bony fish such as hake and other, smaller elasmobranchs. It feeds more actively at night (Bester, Unknown).

### REPRODUCTION

Males mature between 75 and 85cm in length, females slightly larger between 90 and 105cm. It is an ovoviviparous species and there can be 6-20 young in each litter. These pups are born measuring around 25cm in length (Paul and Fowler, 2003).

## COMMERCIAL IMPORTANCE

The Sharptooth Sevengill Shark is sometimes caught in significant numbers by bottom and mid-water trawl and longline fisheries. It is of little commercial importance although its meat is appreciated throughout much of its range. The carcass is likely processed for fishmeal (Paul and Fowler, 2003).

## THREATS, CONSERVATION, LEGISLATION

The population status of the Sharptooth Sevengill Shark is difficult to ascertain as it is a wide ranging, relatively uncommon species. It is likely that populations have decreased in areas where deepwater fishing effort has been high in recent decades but no species specific catch data is available (Paul and Fowler, 2003). There are currently no management measures in place for the species.

## IUCN RED LIST ASSESSMENT

Near Threatened (2003).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

- BESTER, C. Unknown. Sharpnose Sevengill Shark. Florida Museum of Natural History. [www.flmnh.ufl.edu/fish/](http://www.flmnh.ufl.edu/fish/).
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- PAUL, L., FOWLER, S. 2003. *Heptranchias perlo*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. [www.iucnredlist.org](http://www.iucnredlist.org)

Text: Richard Hurst.  
Illustrations: Marc Dando.

### Citation

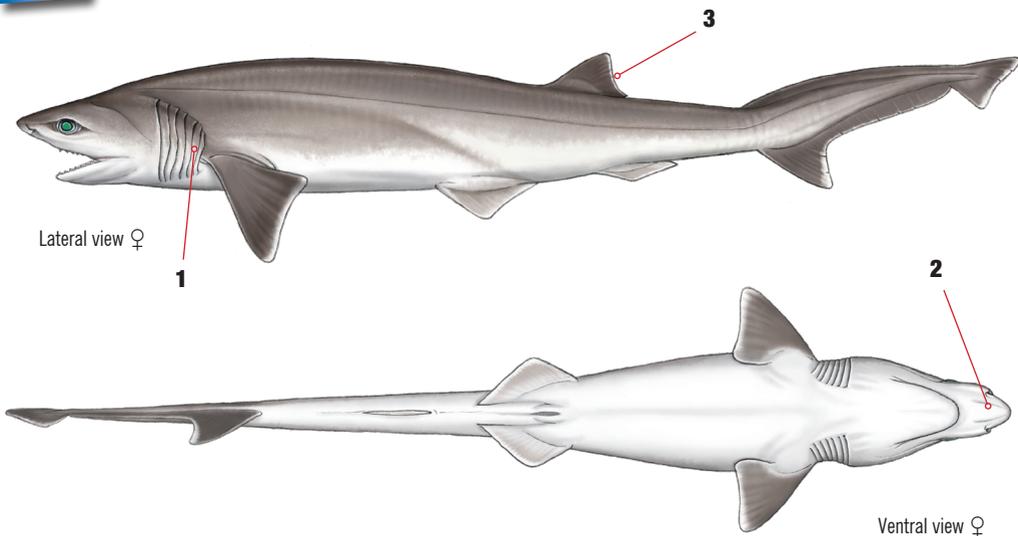
Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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# Sharpnose Sevengill Shark *Heptranchias perlo*



Lateral view ♀

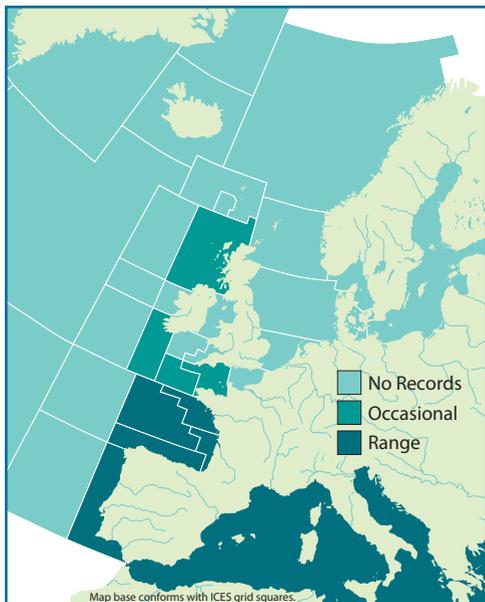
Ventral view ♀

## SCIENTIFIC NAME

*Heptranchias perlo* (Bonnaterre, 1788).

## DISTRIBUTION

Virtually circumglobal. East Atlantic from southern British Isles to Namibia, including the Mediterranean Sea<sup>iii</sup>. One record from Scotland.



## COMMON NAME

**SHARPNOSE SEVENGILL SHARK**, One-Finned Shark, Perlon Shark, Sevengill Cow Shark, Sevengilled Mediterranean Shark, Snouted Sevengill Shark, Slender Sevengill Shark, Requin Perlon (Fr), Cañabota Bocadulce (Es).

## IDENTIFICATION

- 1 Seven large gill slits.
- 2 Sharply pointed snout.
- 3 Single dorsal fin<sup>i</sup>.

## COLOUR

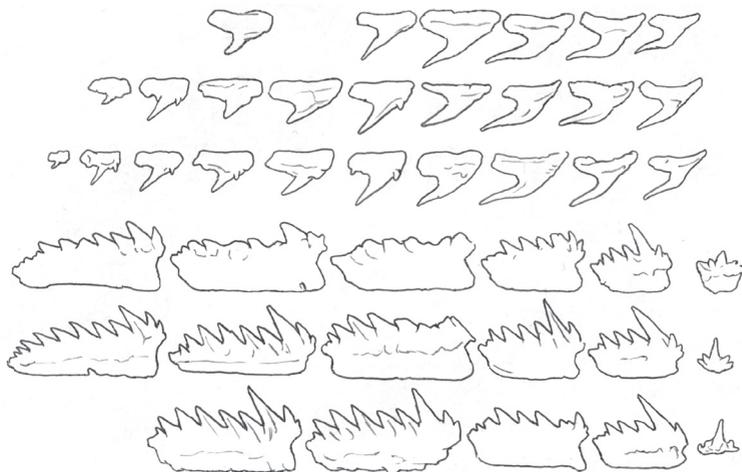
- Brown-grey dorsally.
- Lighter ventrally.
- Fins may have pale posterior margins.
- Faint dark blotches, more prominent in juveniles<sup>i</sup>.

## BIOLOGY AND SIZE

- Born: 25cm. Mature: 90–105cm ♀, 75–85cm ♂. Max TL: 140cm<sup>i</sup>.
- Litters of 6–20 pups have been recorded<sup>iv</sup>.
- Generalist predator feeding on crustaceans, molluscs, teleost fish and other elasmobranchs<sup>i</sup>.



## TEETH



- First 3 or 4 in upper jaw are narrow with hook-like cusps.
- All subsequent teeth have 1 or 2 small cusps.
- Lower teeth are broad and comb-shaped.
- Small symmetrical tooth at symphysis.
- 18–22 upper teeth, 11 lower teeth<sup>i</sup>.

## SIMILAR SPECIES



- *Heptranchias perlo*, Sharpnose Sevengill Shark



- *Hexanchus griseus*, Bluntnose Sixgill Shark



- *Hexanchus nakamurai*, Bigeye Sixgill Shark



- *Chlamydoselachus anguineus*, Frilled Shark

## HABITAT

- 27–1,000m<sup>i</sup>, most common 300–600m<sup>iv</sup>.
- Usually found on or near the seabed although has been recorded pelagically near the surface<sup>i</sup>.
- Possibly aggregate around subsurface features such as seamounts<sup>iv</sup>.

## CONSERVATION STATUS

- No species-specific data available. Wide ranging uncommon species which is likely to have been affected by deepwater fishing effort<sup>iv</sup>.
- **Red List status:** Near Threatened (2003).

## COMMERCIAL IMPORTANCE

- Bycatch species in bottom and pelagic trawl and longline fisheries.
- Sometimes taken in significant numbers around features such as seamounts.
- Usually discarded although it may be utilised for human consumption or fishmeal<sup>iv</sup>.

## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

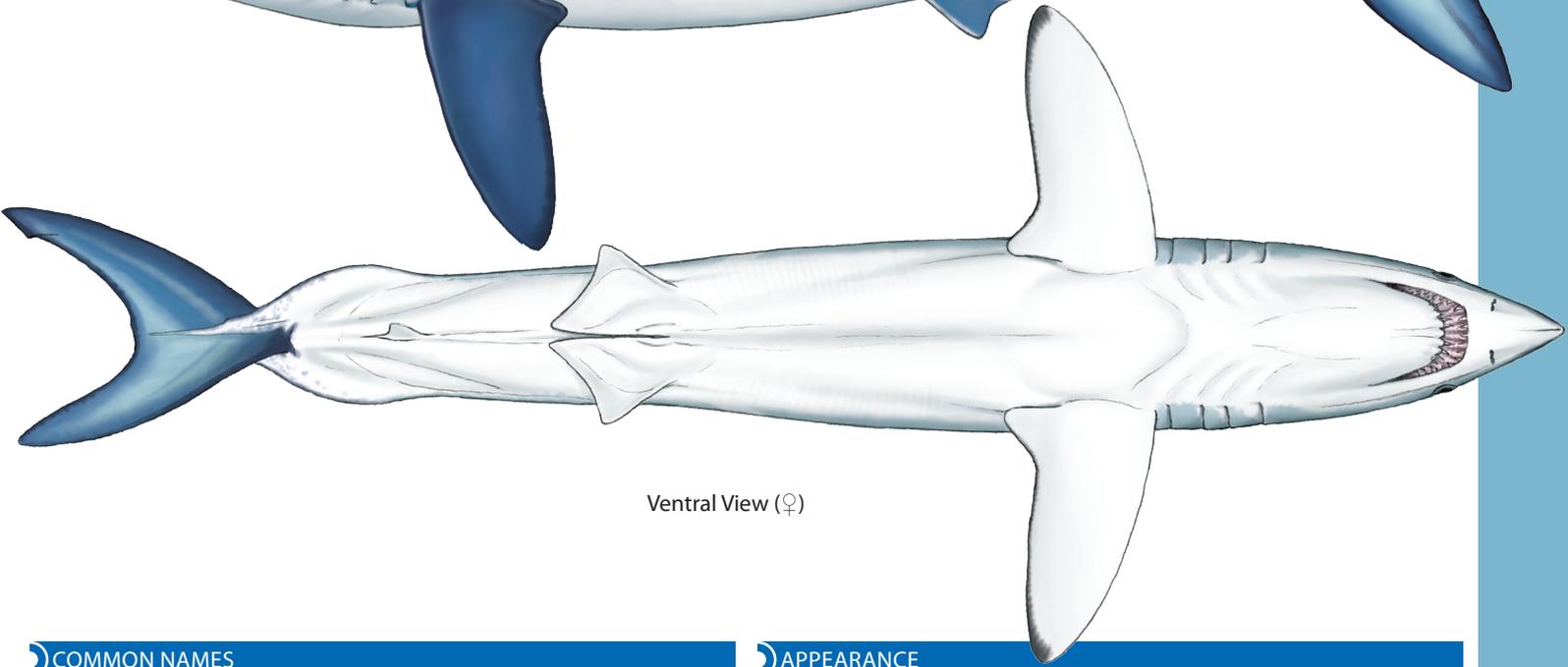
## REFERENCES

- i. Bester, C; Unknown. FLMNH.
- ii. Compagno, L, J, V; 1984. FAO.
- iii. Henderson, A, C *et al*; 2001. *JMBA*.
- iv. Paul, L *et al*; 2003. IUCN.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Shortfin Mako Shark**, Mako, Short-finned Mako, Blue Pointer, Mackerel Shark, Blue Dynamite, Bonito Shark, Taupe Bleu (Fr), Marrajo Dientuso (Es).

### SYNONYMS

*Isurus spallanzani* (Rafinesque 1810), *Oxyrhina spallanzani* (Bonaparte, 1839), *Oxyrhina glauca* (Müller & Henle 1839), *Oxyrhina gomphodon* (Müller & Henle, 1841), *Isuopsis dekayi* (Gill 1862), *Lamna spallanzanii* (Günther, 1870), *Oxyrhina spallanzani* (Moreau, 1881), *Isurus mako* (Whitley 1929), *Isurus africanus* (Smith 1957).

### DISTRIBUTION



The Shortfin Mako Shark is found worldwide in temperate and tropical seas. In the east Atlantic, it is known from Norway to South Africa, including the Mediterranean. It is also known from the western Atlantic, the Pacific and the Indian Oceans (Passarelli *et al.*, Unknown).

### APPEARANCE

- Robust, streamlined shark.
- Large first dorsal fin set behind large pectoral fins.
- Tiny second dorsal and anal fins, roughly equal in size.
- Lunate caudal fin with strong keel.
- Large, dark eyes.
- Maximum length 400cm.
- Grey to vivid blue colouring on dorsal surface.
- Paler/white ventral surface, including the snout and mouth.

Large, robust and streamlined, the Shortfin Mako Shark is extremely hydrodynamically shaped and can attain the highest recorded speed of any shark species. The snout is distinctly conical with large dark eyes. The teeth are long and blade-like without serrations or basal cusps, distinguishing the Shortfin Mako Shark from similar species such as the Porbeagle Shark, *Lamna nasus*, and the Longfin Mako Shark, *Isurus paucus*. The foremost teeth of the lower jaw are visible even when the mouth is closed. The second dorsal fin and anal fin are extremely small. The tail is crescent shaped with almost equal upper and lower lobes. A distinct caudal keel is present. Colouration of the dorsal surface varies from grey to vivid blue. The ventral surface is paler to white (Passarelli *et al.*, Unknown). The largest recorded size for the Shortfin Mako Shark is 400cm total length and 505.8kg in weight (Carpenter, 2009).

## SIMILAR SPECIES

*Isurus paucus*, Longfin Mako Shark

*Lamna nasus*, Porbeagle Shark

*Prionace glauca*, Blue Shark

*Carcharodon carcharias*, White Shark

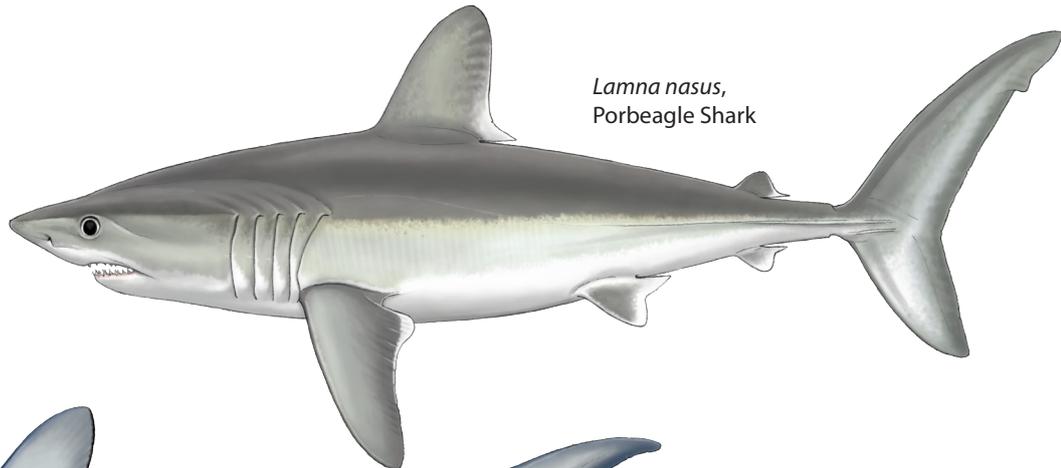
*Isurus oxyrinchus*,  
Shortfin Mako Shark



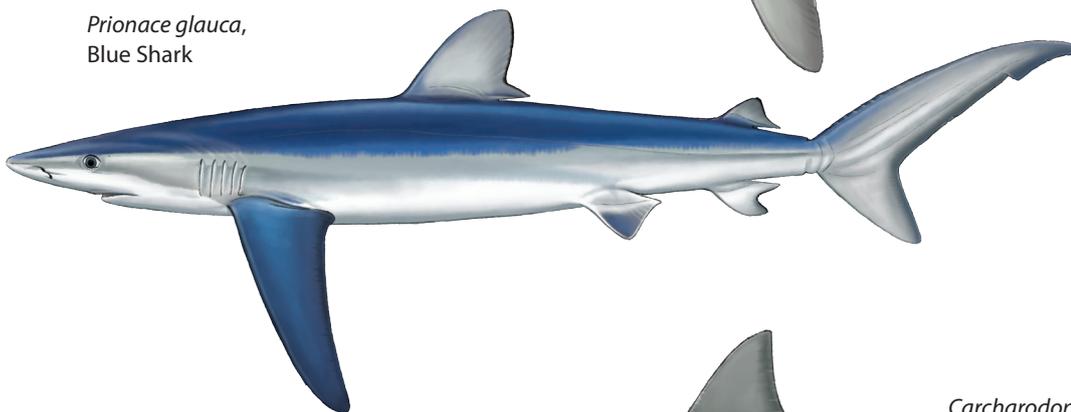
*Isurus paucus*,  
Longfin Mako Shark



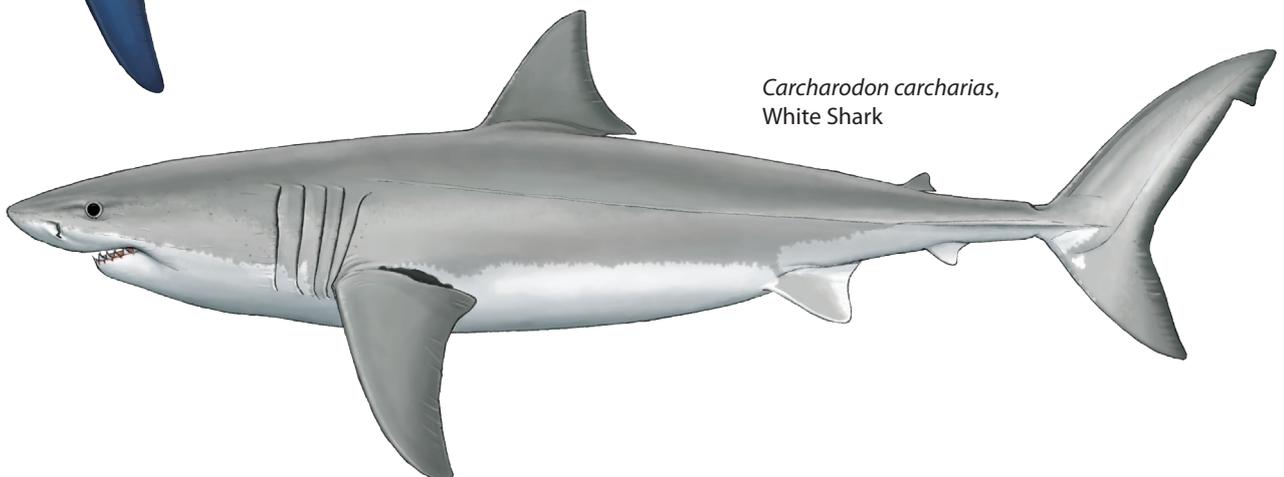
*Lamna nasus*,  
Porbeagle Shark



*Prionace glauca*,  
Blue Shark



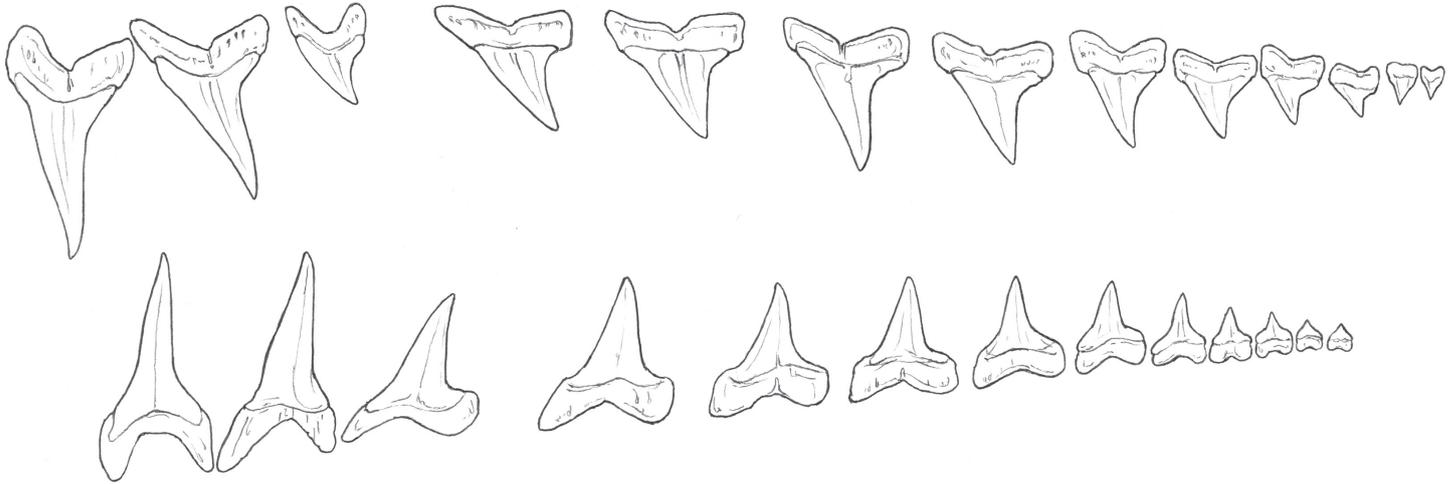
*Carcharodon carcharias*,  
White Shark



(Not to scale)

### TEETH

The teeth are single cusped and awl-shaped without serrations (Comapagno, 2001). The tips of the lower front teeth are visible even when the mouth is shut (Passarelli *et al.*, Unknown). Larger specimens (>3m) have broader, triangular upper teeth (Martin, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Shortfin Mako Shark is predominantly encountered in temperate seas but also in the cooler, deeper water of the tropics where it has been recorded at depths of 400m. There are some records from depths of 740m (Passarelli *et al.*, Unknown). It rarely occurs in waters below 16°C (Stevens, 2000). It is a solitary species but is known to form loose aggregations, possibly at times and in places where food is in excess. Studies of driftnet bycatch suggested that, if it does form groups, they are segregated by sex. Very little mixing between populations seems to occur, such as between the east and west Atlantic. It is known to make long migrations of up to 5,500km but this appears to be rare. Tagged individuals have moved between the northeast USA and the coast of Spain (4,540km), between New Zealand and Fiji (5,500km) and between California and the central Pacific Ocean (2,780km) (Martin, Unknown).

#### REPRODUCTION

Both male and female Shortfin Mako Sharks reach sexual maturity at an age of 4–6 years. This corresponds to a total length of 200cm for males and 275cm for females (Passarelli *et al.*, Unknown). Mating is thought to occur around late summer and autumn and gestation lasts 15–19 months. It is ovoviviparous and the embryos are nourished through oophagy at later stages of development. There are normally between 4 and 25 pups to a litter, with larger females producing more and bigger young (Martin, Unknown). The young are normally born between 68 and 70cm in length. Due to having such a long gestation period, it is thought that the Shortfin Mako Shark only reproduces every 2–3 years (Passarelli *et al.*, Unknown). In the eastern Atlantic the area around the Strait of Gibraltar is thought to be an important nursery area, despite being heavily fished by the swordfish longline fleet (Stevens, 2000).

#### DIET

The Shortfin Mako Shark feeds primarily on bony fish such as mackerels, tunas, bonitos, anchovies, herrings, grunts, lancetfishes, cod, ling, whiting, Australian Salmon, yellowtails, sea basses, porgies and swordfish. It is also known to feed on other sharks such as the Blue Shark, *Prionace glauca*, requiem species, *Carcharhinus* spp. and hammerhead sharks (*Sphyrna* spp.) Other stomach contents have included squid, salp, turtles and occasionally marine mammals (Martin, Unknown).

## COMMERCIAL IMPORTANCE

The Shortfin Mako Shark is an important target species used for its flesh, fins and liver oil. It is also taken as bycatch in high-seas fisheries using longlines and driftnets to target tuna and billfish (Stevens, 2000).

## THREATS, CONSERVATION, LEGISLATION

While there is no directed fishery in name, the Shortfin Mako Shark is a high value species that is retained when caught. It is predominantly captured by Portuguese and Spanish vessels operating in ICES sub-areas VIII, IX and X. EC vessels also take the Shortfin Mako Shark in FAO Area 34. Data from non EC vessels is difficult to obtain, although Japanese and Taiwanese tuna longliners operating in the North Atlantic are known to take 300–500 tons of the species a year (CPOA Shark, 2009).

As for most sharks, population trends for the Shortfin Mako Shark are hard to quantify as catches are generally inadequately recorded and do not include sharks finned and discarded at sea. There is also confusion with the Porbeagle Shark, *Lamna nasus*, and the Blue Shark, *Prionace glauca*, as well as the White Shark, *Carcharodon carcharias*, to a lesser extent. However, from logbook data it would appear that populations have declined by 33–50% in the Atlantic (Stevens, 2000).

In the northeast Atlantic, the Shortfin Mako Shark is covered by EC Regulation No. 1185/2003 which prevents the removal of its fins at sea and the subsequent discard of the body. This applies to all vessels operating in EC waters, as well as to EC vessels operating anywhere (CPOA Shark, 2009). Some countries issue Special Fishing Permits allowing sharks to be landed with their fins unattached, including the UK.

## IUCN RED LIST ASSESSMENT

Vulnerable (2008).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large shark with powerful jaws.
- Abrasive skin.
- Known to attack boats when provoked.

### REFERENCES

- CARPENTER, K. E. 2009. *Isurus oxyrinchus*. Fishbase. [www.fishbase.org](http://www.fishbase.org).
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- STEVENS, J. 2000. *Isurus oxyrinchus*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.1. [www.iucnredlist.org](http://www.iucnredlist.org)

Text: Richard Hurst.  
Illustrations: Marc Dando.

#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

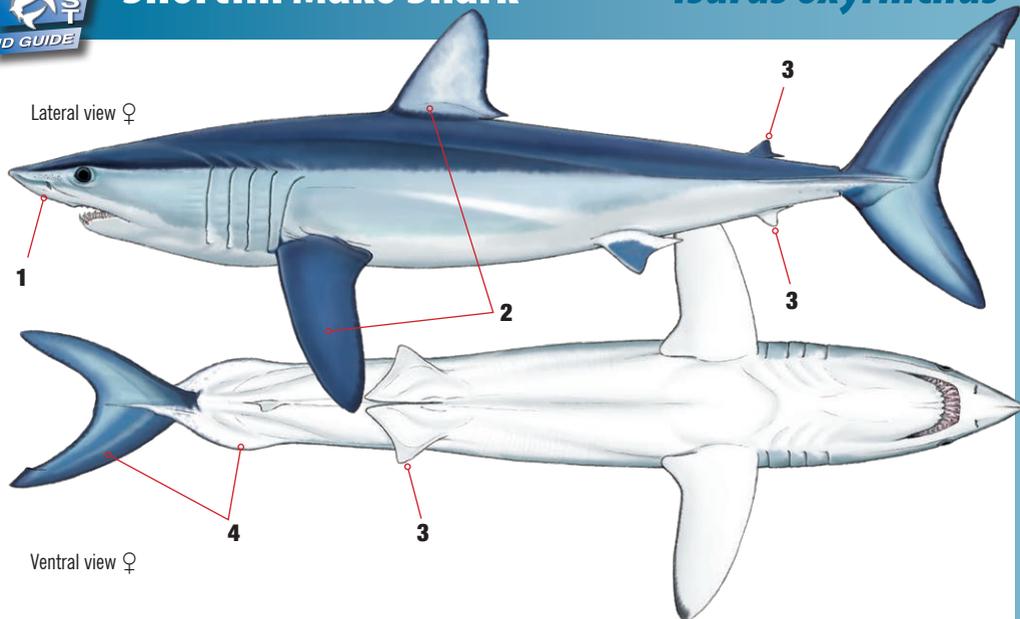
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# Shortfin Mako Shark

*Isurus oxyrinchus*



## SCIENTIFIC NAME

*Isurus oxyrinchus* (Rafinesque, 1810).

## DISTRIBUTION

Circumglobal in temperate and tropical seas. East Atlantic from Norway to South Africa, including the Mediterranean Sea<sup>iv</sup>.



## COMMON NAME

**SHORTFIN MAKO SHARK**, Mako, Short-finned Mako, Blue Pointer, Mackerel Shark, Blue Dynamite, Taupe Bleu (Fr), Marrajo Dientuso (Es).

## IDENTIFICATION

- 1 Streamlined with pointed snout.
- 2 Large first dorsal and pectoral fins.
- 3 Tiny second dorsal, anal and pelvic fins.
- 4 Lunate caudal fin with single keel<sup>ii</sup>.

## COLOUR

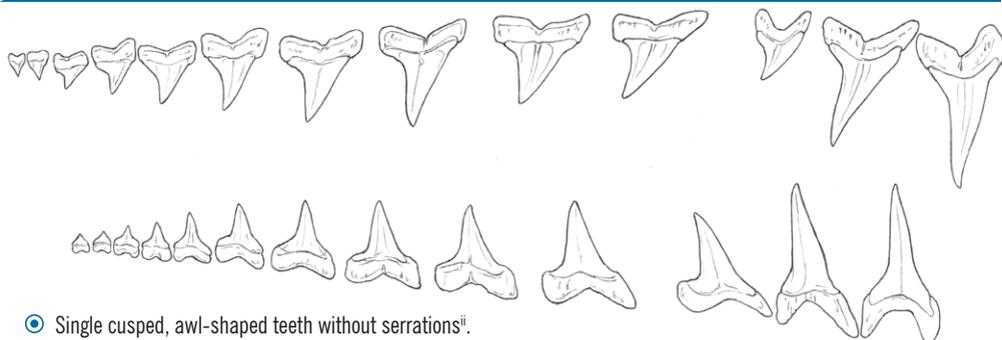
- Metallic blue dorsally.
- Ventrally white, including snout and mouth.
- Distinct demarcation line along flank<sup>iii</sup>.

## BIOLOGY AND SIZE

- Born: 68–70cm. Mature: 275cm ♀, 200cm ♂<sup>iv</sup>. Max TL: 394cm<sup>iii</sup>.
- Maintains its body temperature through a heat-exchange system allowing it to range into temperate regions<sup>iii</sup>.
- Extremely fast, feeding on pelagic species such as tuna, bonito and billfishes. Take a wide variety of teleosts, elasmobranchs, cephalopods and some marine mammals<sup>iii</sup>.
- Litters of 4–25 pups have been reported, possibly to 30<sup>ii</sup>.



## TEETH



- Single cusped, awl-shaped teeth without serrations<sup>ii</sup>.
- Tips of lower front teeth visible when mouth is shut.
- Large specimens (>3m) have broader, triangular upper teeth<sup>iv</sup>.

## SIMILAR SPECIES



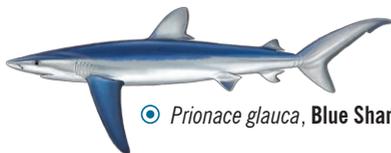
● *Isurus oxyrinchus*,  
Shortfin Mako Shark



● *Isurus paucus*,  
Longfin Mako Shark



● *Lamna nasus*, Porbeagle Shark



● *Prionace glauca*, Blue Shark



● *Carcharodon carcharias*,  
White Shark

## HABITAT

- Surface to at least 400m, possibly 740m.
- Prefer water 17–20°C, although can be found to at least 5°C.
- Migrates seasonally to follow warmer waters within well defined geographical limits, restricting genetic interchange between populations<sup>iv</sup>.
- Primarily a solitary species, has been known to form aggregations when food is abundant. Segregates by sex<sup>iii</sup>.

## CONSERVATION STATUS

- Populations difficult to quantify due to inadequate and inaccurate reporting. Logbook data indicate declines of 33–50% in the North Atlantic<sup>i</sup>.
- Red List status:** Vulnerable (2008).

## COMMERCIAL IMPORTANCE

- Important secondary target for pelagic longline fisheries targeting tuna and Swordfish.
- Highly prized for its flesh, as well as its fins and liver oil.
- Extremely popular game fish due to its hard fight and habit of breaching when hooked<sup>iii</sup>.

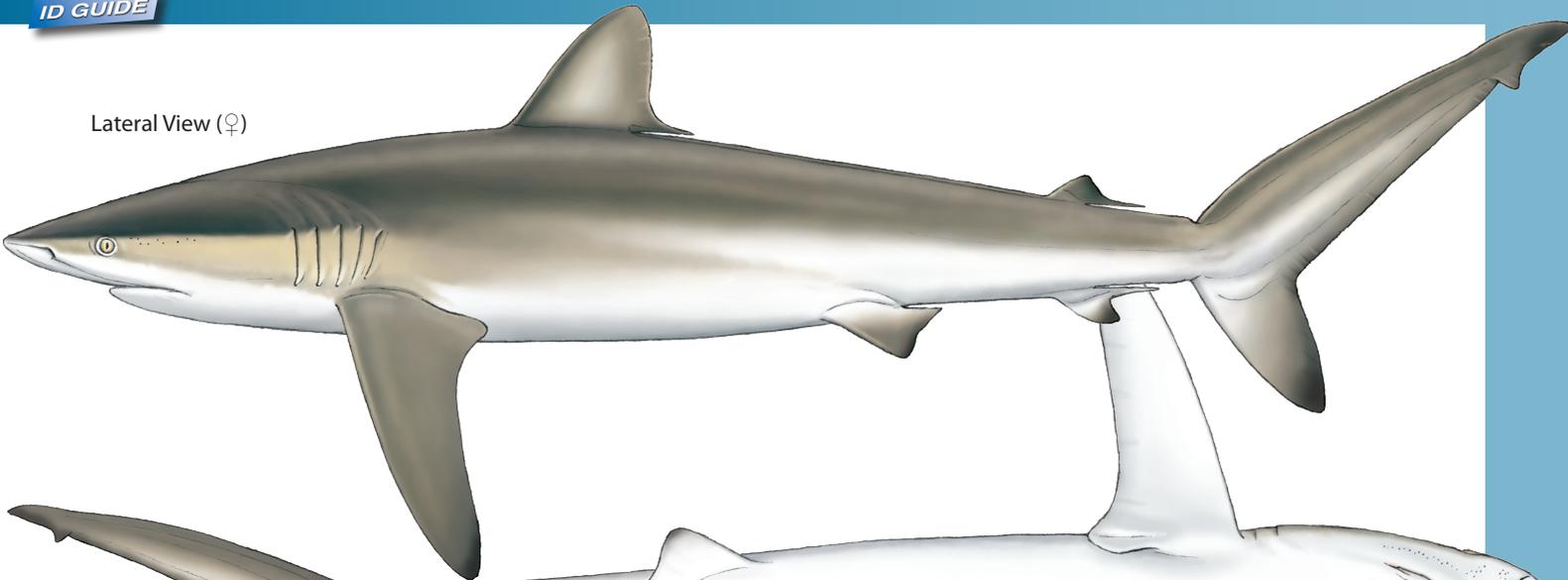
## HANDLING

- Handle with care.
- Large shark with powerful jaws.
- Abrasive skin.

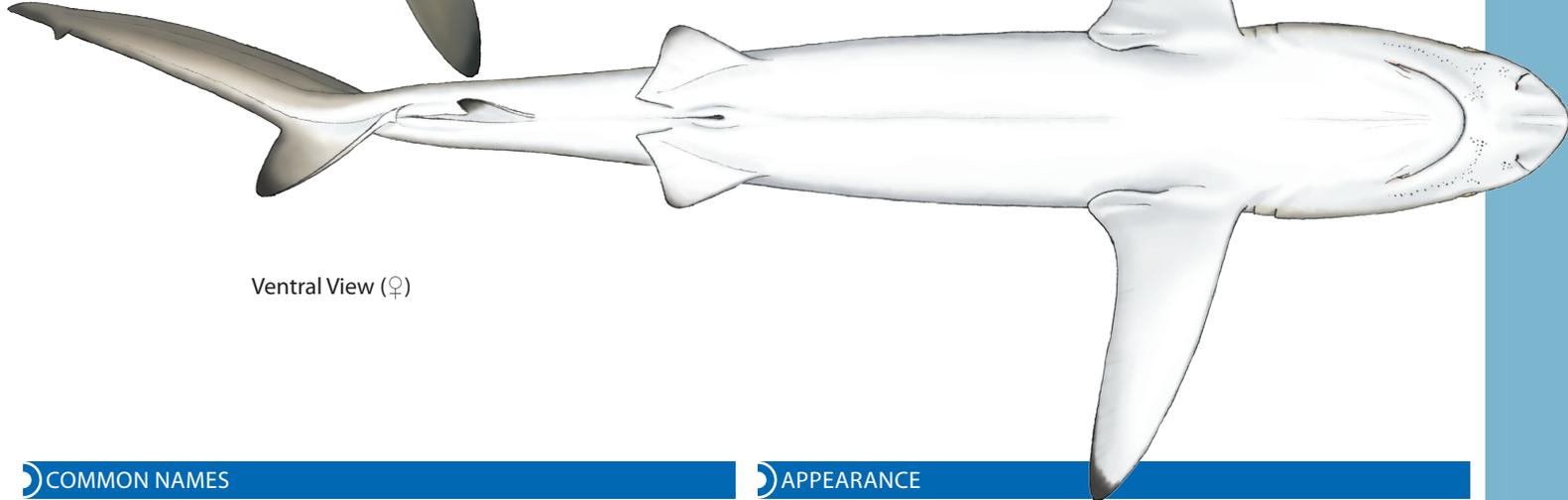
## REFERENCES

- Cailliet, G. M. *et al*; 2008. IUCN Red List.
- Compagno, L. J. V; 2001. FAO.
- Martin, R. A; Unknown. Reefquest Centre for Shark Research.
- Passarelli, N. *et al*; Unknown. FLMNH.

Lateral View (♀)



Ventral View (♀)



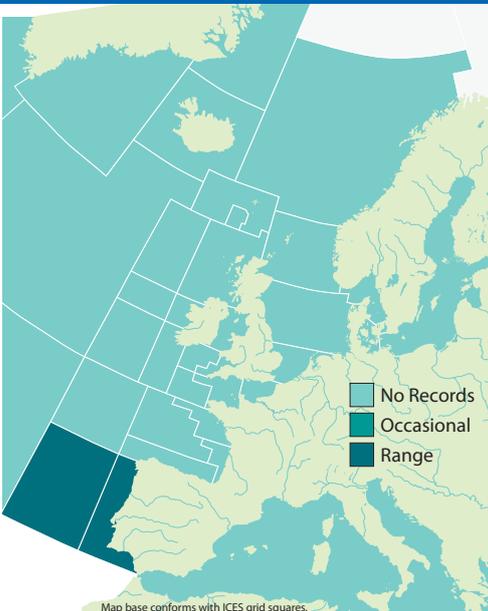
## COMMON NAMES

**Silky Shark**, Blackspot Shark, Grey Whaler Shark, Olive Shark, Reef Shark, Ridgeback Shark, Sickie Shark, Net-eater Shark (eastern Pacific), Requin Soyeux (Fr), Tiburón Jaquetón (Es).

## SYNONYMS

*Carcharias falcipinnis* (Lower, 1839), *Carcharias (Prionodon) menisorrah* (Valenciennes, in Müller & Henle, 1839), *Carcharias (Prionodon) falciformis* (Müller & Henle, 1841), *Squalus* or *Prionodon tiburo* (Poey, 1860), *Gymnorhinus* or *Gymnorhinus pharaonis* (Hemprich & Ehrenberg, 1899), *Aprionodon sitankaiensis* (Herre, 1931), *Carcharhinus floridanus* (Bigelow, Schroeder & Springer, 1943), *Eulamia malpeloensis* (Fowler, 1944), *Carcharhinus atrodorsus* (Deng, Xiong & Zhan, 1981).

## DISTRIBUTION



The Silky Shark is a common tropical, subtropical and warm temperate species found worldwide. In the east Atlantic, it is known from Spain to Angola but is absent from the Mediterranean Sea (Compagno, 1984).

## APPEARANCE

- Moderately long rounded snout.
- Moderately large eyes.
- Interdorsal ridge present.
- Long, narrow pectoral fins.
- Moderately sized first dorsal fin originating behind the pectoral free rear tips.
- Low second dorsal with elongated inner margin and free rear tips. Dark grey with a bronze tint dorsally.
- White ventrally.
- Tips of fins dusky, with the exception of the first dorsal. More obvious in juveniles.

A large, slender *Carcharhinus* species reaching up to 330cm, the Silky Shark has a moderately long, pointed snout and large eyes. The first dorsal fin is moderately sized and originates behind the pectoral fin free rear tips. The second dorsal fin is low with a greatly elongated inner margin and free rear tip. There is a narrow, low interdorsal ridge present. The pectoral fins are long and narrow (Compagno, 1984).

Colouration is dark grey to bronze dorsally and white ventrally. The tips of the fins are dusky with the exception of the first dorsal fin. These markings are more obvious in juveniles (Knickle, Unknown).

## SIMILAR SPECIES

*Carcharhinus brachyurus*, Copper Shark

*Carcharhinus brevipinna*, Spinner Shark

*Carcharhinus obscurus*, Dusky Shark

*Carcharhinus plumbeus*, Sandbar Shark

*Carcharhinus falciformis*,  
Silky Shark

*Carcharhinus brachyurus*,  
Copper Shark

*Carcharhinus brevipinna*,  
Spinner Shark

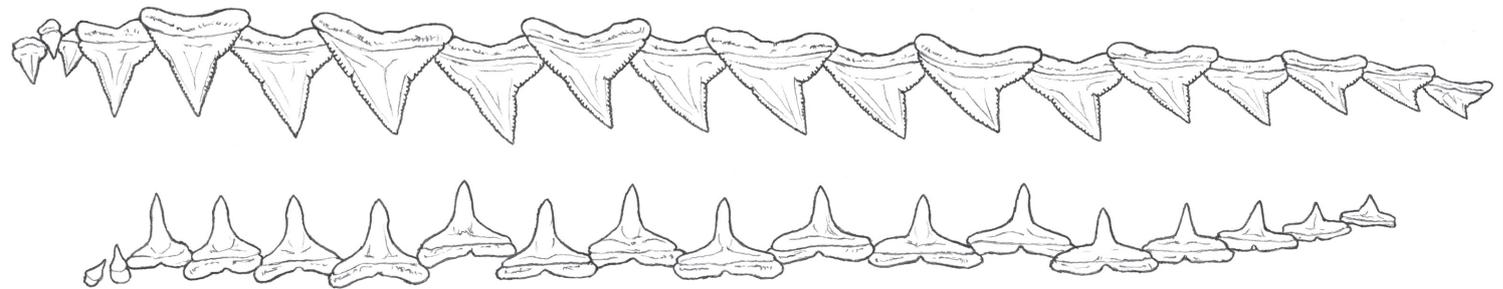
*Carcharhinus obscurus*,  
Dusky Shark

*Carcharhinus plumbeus*,  
Sandbar Shark

(Not to scale)

### TEETH

The upper teeth are broadly triangular and oblique with serrated edges. The lower teeth are erect with smooth edges. There are one or two symphyseal teeth in both jaws (Knickle, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

Essentially a pelagic species, the Silky Shark has been recorded from the surface to 500m over water 18–4,000m deep. Commonly found around the edges of continental shelves and over deepwater reefs where there is an abundance of prey. It is an active, fast moving, aggressive shark which prefers warm water around 23–24°C (Compagno, 1984).

Longline sampling in the eastern and central Pacific has shown the species to be much more abundant offshore near land than in the open ocean, unlike other pelagic sharks such as the Blue Shark, *Prionace glauca*, and the Oceanic Whitetip Shark, *Carcharhinus longimanus*. There is no data to suggest sexual segregation for the Silky Shark but it may still occur. There is segregation by size with young found in offshore nursery areas and adults found further offshore than them (Compagno, 1984).

#### DIET

The Silky Shark is primarily a piscivore feeding on a variety of pelagic and inshore teleost fish such as catfish, mullets, mackerel, yellowfin tuna, albacore and porcupine fish. It is also feeds on squid, paper nautilus and pelagic crabs. It is often found with schools of tuna and has earned the name Net-eater Shark from purse-seiners in the tropical eastern Pacific due to its habit of damaging tuna nets (Compagno, 1984).

#### REPRODUCTION

The size at sexual maturity for the Silky Shark varies greatly with location. In the eastern Pacific both males and females mature at a total length of 180cm. From southeast Africa in the Indian Ocean, studies suggest it matures much larger, females at 248–260cm, males at 240cm. In the eastern Atlantic, males mature at around 220cm, females at around 238–250cm (Bonfil, 2008).

The Silky Shark is a viviparous species utilising a yolk-sac placenta to nourish the embryos. The gestation period is approximately 12 months and it has been reported that reproduction occurs biennially. Litters of 6–16 pups measuring 65–80cm in length have been reported. There is a positive correlation between the size of the mother and litter size. In many populations there appears to be no seasonality in the reproductive cycle (Bonfil, 2008).

#### EGGCASE

N/A

## COMMERCIAL IMPORTANCE

The Silky Shark is taken as bycatch in large numbers in pelagic longline and gillnet fisheries across much of its range. In the Maldives and Sri Lanka it can comprise 70–80% of the pelagic longline catch. It is also taken by multi-species shark fisheries, particularly in the Gulf of Mexico and around Japan. It is primarily sought for its meat and fins as well as its liver oil and hide. It is regularly targeted by recreational fishermen (Knickle, Unknown).

## THREATS, CONSERVATION, LEGISLATION

The Silky Shark is a relatively common shark discontinuously distributed throughout the world's tropical and warm temperate oceans. It has a limited reproductive potential, lower than other exploited pelagic elasmobranchs such as the Blue Shark, *Prionace glauca*. It is the dominant bycatch species in tropical oceanic fisheries but is often unreported or misidentified. It is one of the three most important species in the global fin trade. In the northwest Atlantic, declines of 85% have been observed over 19 years for all *Carcharhinus* spp. Species specific population trends are difficult to determine because of confusion with other species (Gibson *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Near Threatened (2008).

## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

### REFERENCES

- BONFIL, R. 2008. The Biology and Ecology of the Silky Shark, *Carcharhinus falciformis*. In: Camhi, M. D., Pikitch, E. K., Babcock, E. A. (Eds.) 2008. Sharks of the Open Oceans: Biology, Fisheries and Conservation. Blackwell Publishing. Oxford, UK.
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Text: Richard Hurst.  
Illustrations: Marc Dando.

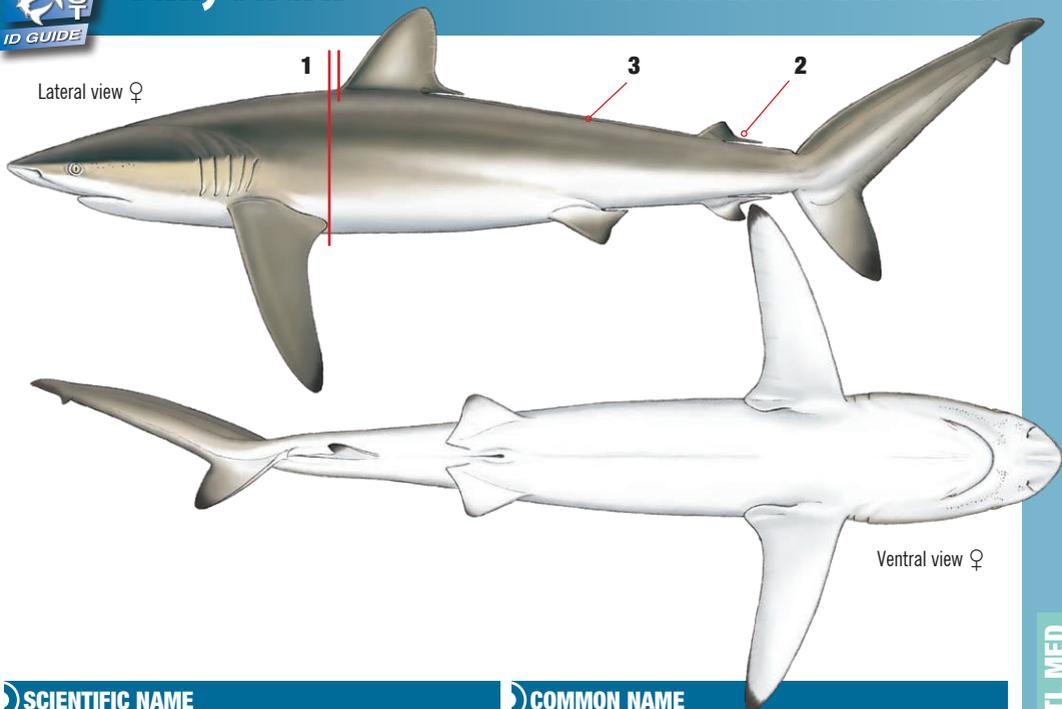
#### Citation

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Lateral view ♀

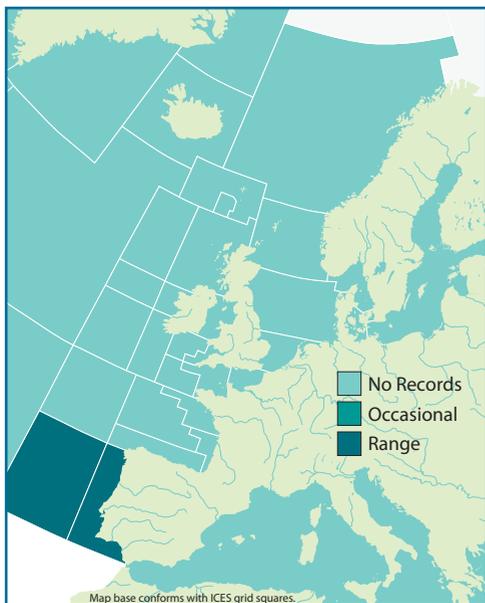
Ventral view ♀

## SCIENTIFIC NAME

*Carcharhinus falciformis* (Bibron, 1839)

## DISTRIBUTION

Widely distributed in tropical and warm temperate waters. East Atlantic from Portugal to northern Angola<sup>ii</sup>.



## COMMON NAME

**SILKY SHARK**, Blackspot Shark, Grey Whaler Shark, Olive Shark, Reef Shark, Ridgeback Shark, Sickle Shark, Net-eater Shark, Requin Soyeux (Fr), Tiburón Jaquetón (Es).

## IDENTIFICATION

- 1 First dorsal fin behind pectoral fins.
- 2 Second dorsal fin with greatly elongated inner margin and rear tip.
- 3 Interdorsal ridge present<sup>ii</sup>.

## COLOUR

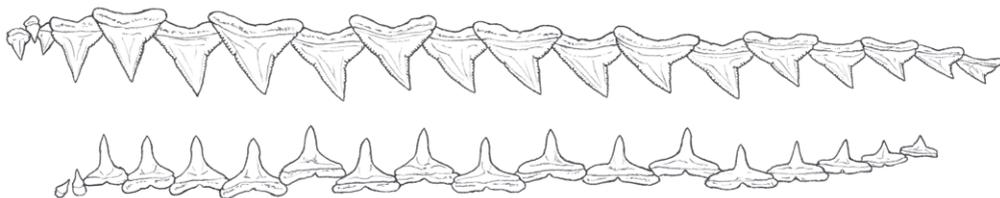
- ◉ Dark grey with a bronze tint dorsally.
- ◉ White ventrally.
- ◉ Fin tips dusky, except first dorsal fin. More obvious in juveniles<sup>iii</sup>.

## BIOLOGY AND SIZE

- ◉ Born: 70–87cm. Mature: 213–230cm ♀, 187–217cm ♂. Max TL: ~330cm.
- ◉ Gestation period 12 months, litters of 2–14 possibly on alternate years.
- ◉ Feeds on a wide variety of teleost fish, cephalopods and crustaceans, both benthically and pelagically<sup>iii</sup>.



## TEETH



- Upper teeth broadly triangular and oblique with serrated edges.
- Lower teeth erect with smooth edges.
- One or two symphyseal teeth in both jaws<sup>iii</sup>.

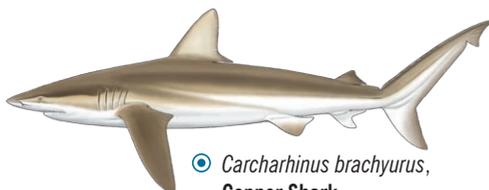
## SIMILAR SPECIES



◉ *Carcharhinus falciformis*,  
Silky Shark



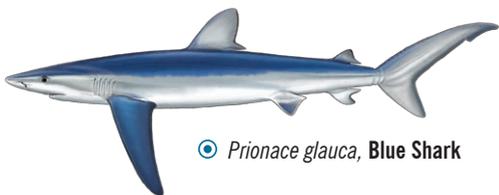
◉ *Carcharhinus brevipinna*,  
Spinner Shark



◉ *Carcharhinus brachyurus*,  
Copper Shark



◉ *Carcharhinus obscurus*,  
Dusky Shark



◉ *Prionace glauca*, Blue Shark

## HABITAT

- Surface to at least 500m, most common >200m.
- Active shark which prefers warmer water around 23–24°C.
- Primarily pelagic, not restricted to the open ocean and can be encountered inshore around reefs<sup>iii</sup>.

## CONSERVATION STATUS

- Data lacking but life history traits and large numbers taken in fisheries are likely to be having a significant impact on populations<sup>i</sup>.
- Red List status:** Least Concern (2000).

## COMMERCIAL IMPORTANCE

- Taken in large numbers as bycatch in oceanic fisheries.
- Often unreported or misidentified so stocks hard to quantify.
- Landed for its meat, fins, hide and liver<sup>i</sup>.
- Important for ecotourism in the Red Sea.

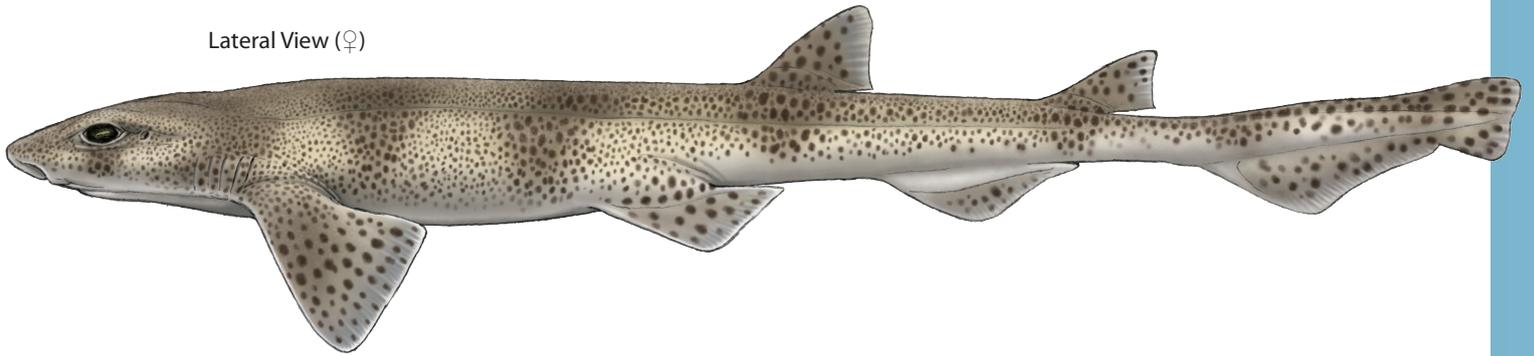
## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

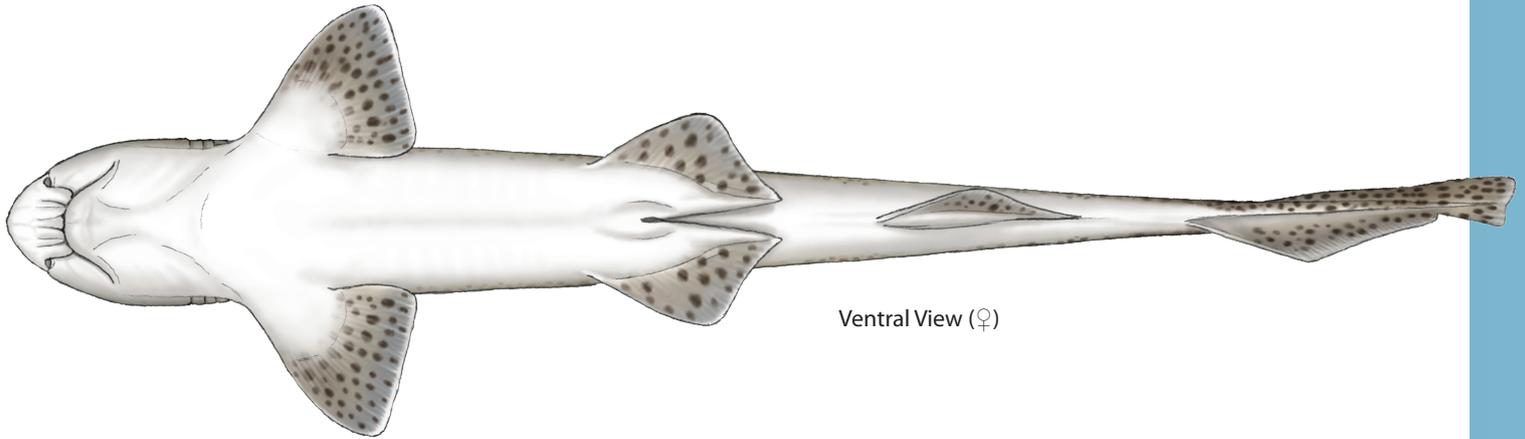
## REFERENCES

- Bonfil, R; 2000. IUCN Red List.
- Compagno, L. J. V. *et al*; 2005. HarperCollins Publishers.
- Knickle, C; Unknown. FLMNH.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Smallspotted Catshark**, Lesser Spotted Dogfish, Rough Hound, Rock Salmon, Sandy Dogfish, Doggie, Petite Roussette (Fr), Pintarroja (Es).

### SYNONYMS

*Squalus canicula* (Linnaeus, 1758), *Squalus catulus* (Linnaeus, 1858), *Squalus elegans* (Blainville, 1825), *Scyllium spinacipellitum* (Vaillant, 1888), *Scellium acutidens* (Vaillant, 1888), *Scyliorhinus canicula* var. *albomaculata* (Pietschmann, 1907), *Catulus duhamelii* (Garman, 1913).

### DISTRIBUTION



The Small Spotted Catshark is known throughout the northeast Atlantic and Mediterranean from Norway and the British Isles to Senegal and possibly the Ivory Coast (Compagno, 1984).

### APPEARANCE

- First dorsal fin set behind pelvic fins.
- Second dorsal fin behind anal fin.
- Almost straight caudal fin with well developed ventral lobe.
- Nasal furrows **do** reach the mouth.
- Reported maximum size of 100cm, rarely seen larger than 80cm.
- Pale brown dorsally with pattern of numerous dark spots.
- Ventrally white.

Most commonly encountered around the coasts of northern Europe, the Small Spotted Catshark is a small, slender catshark with attractive colouring. The snout is prominent with well developed nasal flaps that reach the mouth and cover the nasal furrows. This distinguishes the Small Spotted Catshark from the Nursehound, *Scyliorhinus stellaris*, in which they reach only halfway to the mouth. The pectoral fins are relatively large. The first dorsal fin is set behind the pelvic fins and the origin of the second dorsal fin is above the end of the anal fin. There are no dorsal spines. The caudal fin is long and almost straight with a large ventral lobe (Compagno, 1984). There is some sexual dimorphism in the Small Spotted Catshark; males have longer heads with longer, narrower mouths for example. For a full discussion see Filiz & Taşkavak (2006) or Ellis and Shackley (1995).

On the dorsal surface the Small Spotted Catshark is light brown to grey with a pattern of numerous dark spots on the back and fins. Ventrally it is white. The maximum recorded size for the Small Spotted Catshark is 100cm total length although it is rarely found larger than 80cm (Pizzolla, 2008).

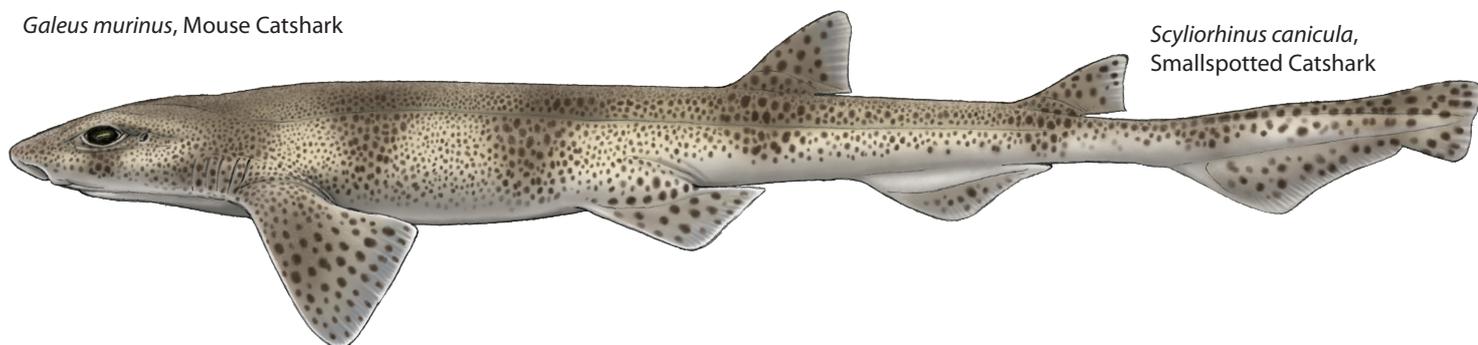
## SIMILAR SPECIES

*Scyliorhinus stellaris*, Nursehound

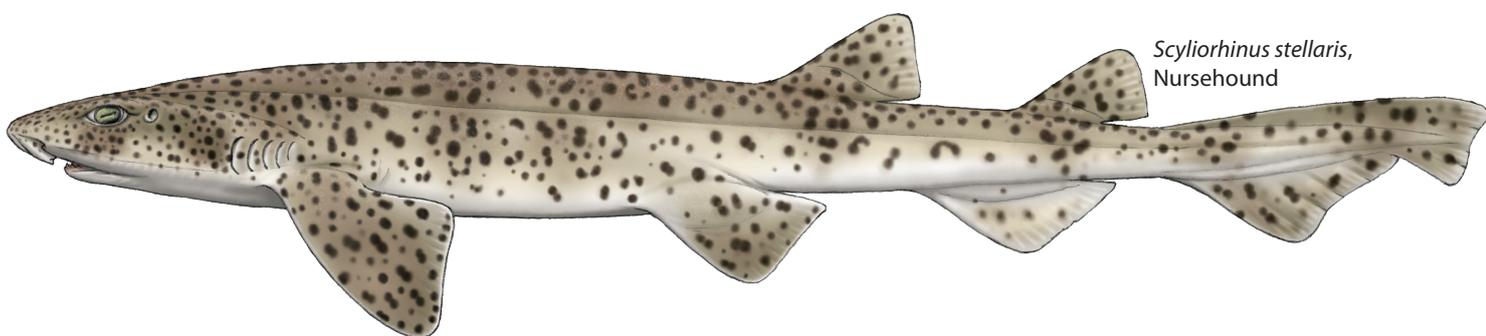
*Galeus melastomus*, Blackmouth Catshark

*Galeus atlanticus*, Atlantic Sawtail Catshark

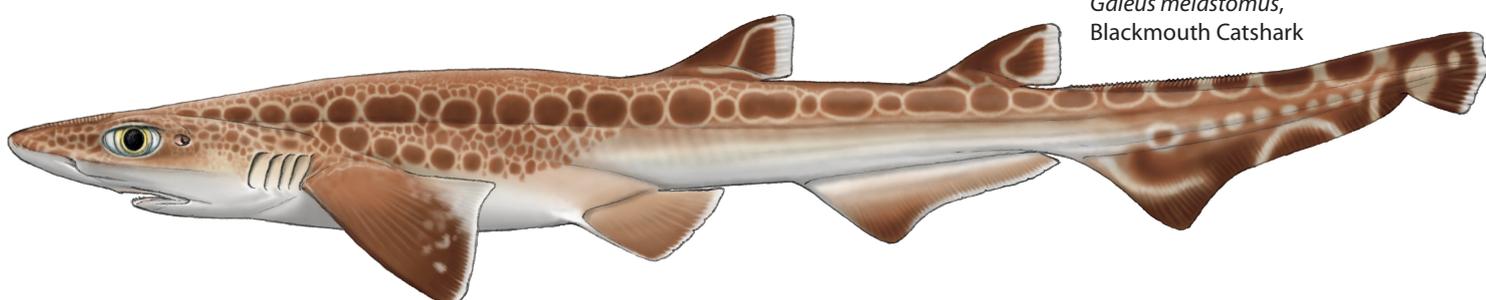
*Galeus murinus*, Mouse Catshark



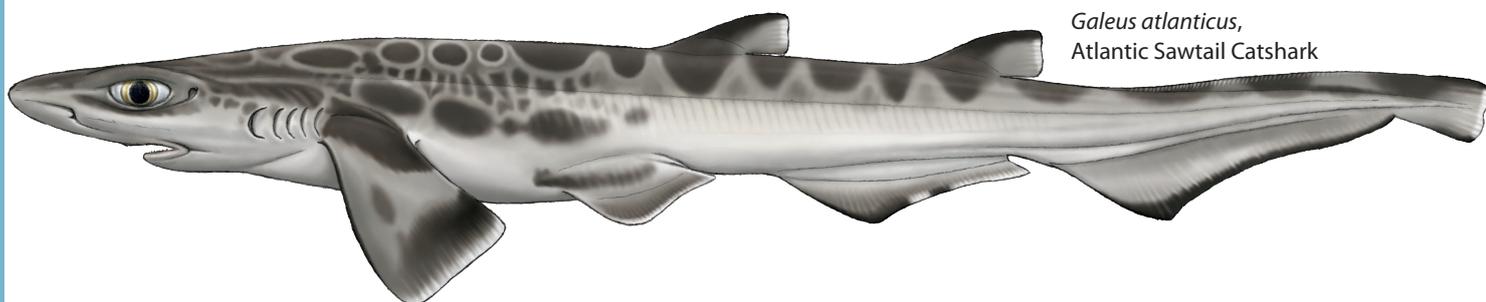
*Scyliorhinus canicula*,  
Smallspotted Catshark



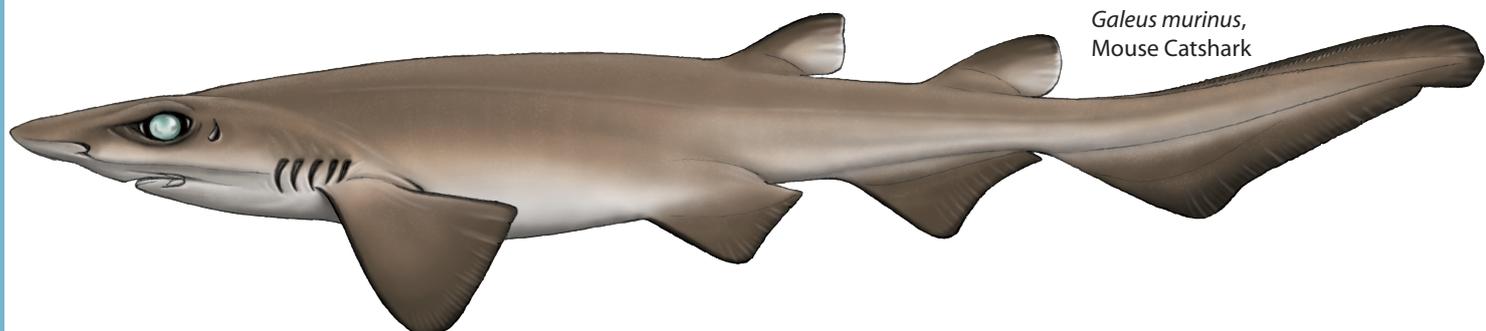
*Scyliorhinus stellaris*,  
Nursehound



*Galeus melastomus*,  
Blackmouth Catshark



*Galeus atlanticus*,  
Atlantic Sawtail Catshark

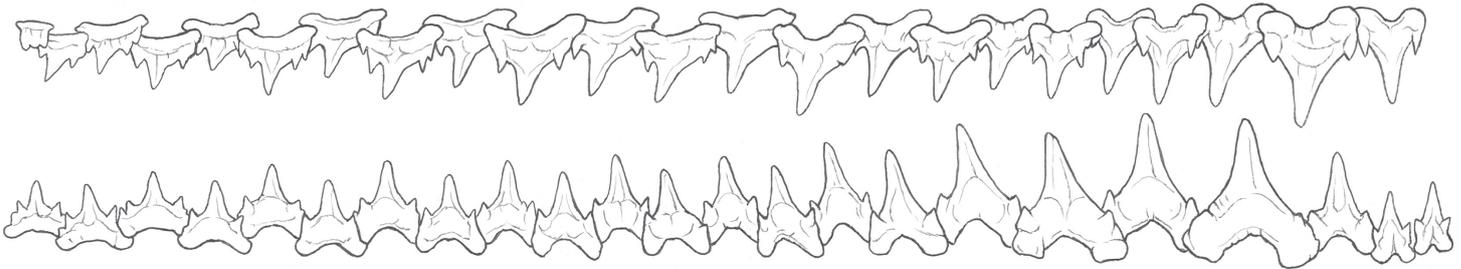


*Galeus murinus*,  
Mouse Catshark

(Not to scale)

## TEETH

Nine different tooth types have been recorded from the Smallspotted Catshark. These range from strongly oblique with single cusps to erect with five cusps (Gajić, Unknown). Males have wider mouths and longer teeth than females (Ellis and Shackley, 1995).



## ECOLOGY AND BIOLOGY

### HABITAT

The Smallspotted Catshark is a bottom dwelling shark most usually found over sand, mud, algae, gravel and rocky bottoms from the shallow sublittoral to depths of 400m, although it is much less common below 100m (Compagno, 1984). It is a nocturnal predator which spends the day resting on the bottom. In this state it may allow divers to get extremely close and may not react when handled, although this is not advised (Scott, 2003).

It has been reported from the waters around Plymouth, UK and in the Cantabrian Sea that during the summer females are found significantly more often than males. It has also been reported from Plymouth waters that this trend is reversed in the winter with males dominant. This is thought to be related to females coming inshore to lay their eggs during the warmer months (Ivory *et al.*, 2004).

### DIET

Research from the Isle of Man has suggested that the Smallspotted Catshark is an opportunistic predator on a wide range of macrobenthic fauna with hermit crabs, cockles and whelks dominant prey items. Other items included various crabs, callinassid shrimps, bivalve molluscs, holothurians, polychaetes and herring when available. It appears that dietary preferences change with age; younger animals prefer small crustaceans, older animals prefer hermit crabs and molluscs. It was also observed that feeding intensity was highest during the summer, at least in part due to the higher availability of prey (Lyle, 1983).

### REPRODUCTION

Male Smallspotted Catsharks reach first maturity at around 49cm, with 50% of individuals mature by 53.5cm (6.6 years) and 100% of individuals mature at 62cm. Females reach first maturity at around 52cm, with 50% of individuals mature by 57cm (7.9 years) and 100% of individuals mature at 69cm. These values only apply to the northeast Atlantic, particularly to Irish waters. In the warmer Mediterranean Sea, the Small Spotted Catshark grows and matures more rapidly (Ivory *et al.*, 2004). It has been noted that as males mature their dentition changes with the teeth becoming longer and sharper. This is likely due to reproductive behaviour as Lyle (1983) showed there is no significant difference between the diet of males and females (Lyle, 1983). Males use these longer teeth to hold the females during copulation (Filiz and Taşkavak, 2006).

Females lay their eggs during spring and early summer in near shore nursery grounds. These eggs usually measure 4cm by 2cm and they are never longer than 6cm, not including tendrils. These eggcases can be found washed up in clumps all around the coasts of Europe and can be seen by divers (Shark Trust, 2005). The embryos develop for 5–11 months depending on the sea temperature, most usually between 8 and 9 months. The young are born measuring 9–10cm (Compagno, 1984).

### EGGCASE

- 4cm in length (excluding horns).
  - 2cm in width.
  - Long tendrils at each corner (Shark Trust, 2005).
- Similar eggcase to the Nursehound, *Scyliorhinus stellaris*.

## COMMERCIAL IMPORTANCE

The Small Spotted Catshark is taken in commercial fisheries across its range and larger individuals are sometimes retained for human consumption. The majority are discarded however (Gibson *et al.*, 2006). Recreational anglers tend to regard them as a pest as they will take almost any bait, reducing catches of target fish.

## THREATS, CONSERVATION, LEGISLATION

One of the most abundant elasmobranchs in the northeast Atlantic and Mediterranean, the Small Spotted Catshark is regularly taken in near-shore fisheries and is sometimes landed for human consumption. The majority of those taken by commercial fisherman and almost all of those taken by recreational anglers are discarded (Gibson *et al.*, 2006). Studies have shown that post-discard survival rates are extremely high, around 98% (Revell *et al.*, 1983).

Although localised depletion may have occurred in some areas, such as the Wadden Sea off Malta, surveys have shown that populations are stable or are even increasing throughout the majority of its range. However, continued monitoring of landing and discard data is important to avoid any future declines (Gibson *et al.*, 2006).

## IUCN RED LIST ASSESSMENT

Least Concern (2008).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

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Text: Richard Hurst.  
Illustrations: Marc Dando.

### Citation

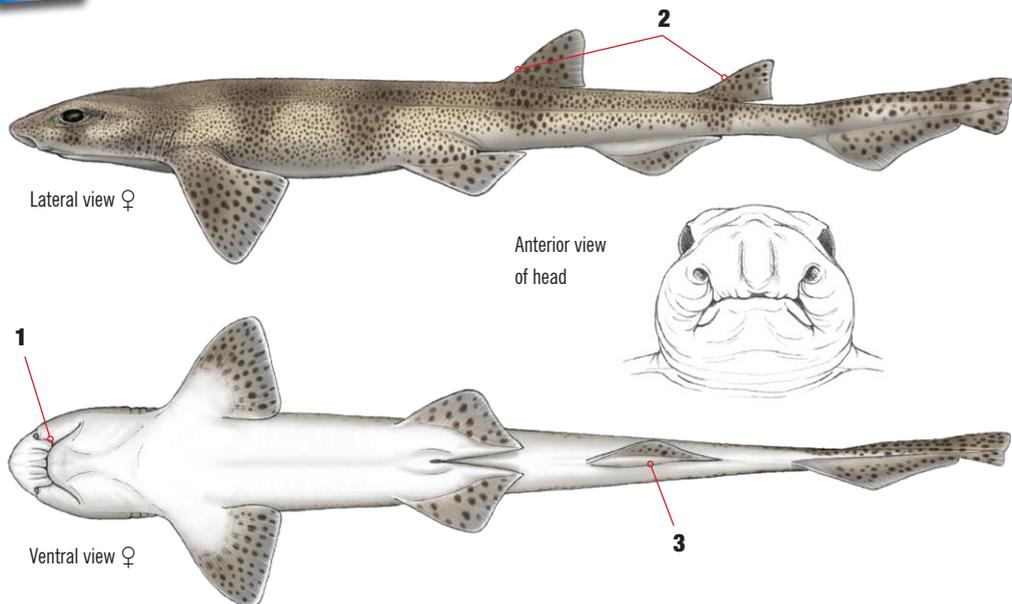
Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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For more ID materials visit [www.sharktrust.org/ID](http://www.sharktrust.org/ID).

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# Smallspotted Catshark *Scyliorhinus canicula*



Lateral view ♀

Anterior view  
of head

Ventral view ♀

## SCIENTIFIC NAME

*Scyliorhinus canicula* (Linnaeus, 1758).

## DISTRIBUTION

Norway to Senegal and possibly the Ivory Coast, including the Mediterranean Sea<sup>1</sup>.



## COMMON NAME

**SMALLSPOTTED CATSHARK**, Lesser Spotted Dogfish, Rough Hound, Rock Salmon, Sandy Dogfish, Doggie, Petite Roussette (Fr), Pintarroja (Es).

## IDENTIFICATION

- 1 Nasal furrows reach the mouth.
- 2 No dorsal spines.
- 3 Anal fin present<sup>1</sup>.

## COLOUR

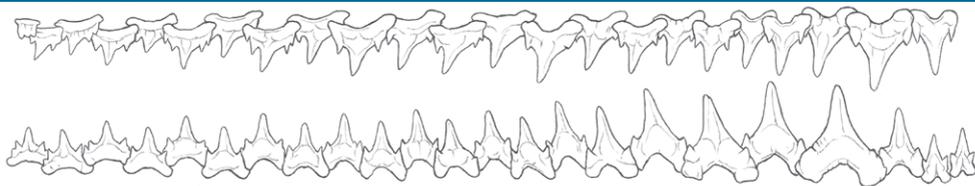
- Pale brown dorsally.
- Pattern of numerous dark spots.
- White ventrally<sup>1</sup>.

## BIOLOGY AND SIZE

- Born: 9–10cm<sup>1</sup>. Mature: 57cm ♀, 54cm ♂<sup>v</sup>. Max TL: 80cm<sup>1</sup>.
- Oviparous, incubation periods of 5–11 months have been reported depending on water temperature<sup>1</sup>.
- Opportunistic feeder which will take most suitably sized prey. Crustaceans and molluscs particularly important<sup>vi</sup>.



## TEETH



- ◉ Nine different tooth types.
- ◉ Strongly oblique with single cusps to erect with five cusps<sup>iv</sup>.
- ◉ Males have wider mouths and longer teeth than females<sup>iv</sup>.

## SIMILAR SPECIES



- ◉ *Scyliorhinus canicula*, **Smallspotted Catshark**



- ◉ *Scyliorhinus stellaris*, **Nursehound**



- ◉ *Galeus melastomus*, **Blackmouth Catshark**



- ◉ *Galeus murinus*, **Mouse Catshark**



- ◉ *Galeus atlanticus*, **Atlantic Sawtail Catshark**

## HABITAT

- ◉ Intertidal to 400m, although rare below 100m<sup>i</sup>.
- ◉ Nocturnal, resting on the bottom during the day and actively hunting at night<sup>ii</sup>.
- ◉ Segregate by sex, more females are found inshore during the warmer months whilst egglaying<sup>7</sup>.

## CONSERVATION STATUS

- ◉ Extremely abundant species with a relatively high fecundity. Populations appear to be stable or increasing across its range<sup>iii</sup>.
- ◉ **Red List status:** Least Concern (2008).

## COMMERCIAL IMPORTANCE

- ◉ Taken as bycatch in bottom trawls and line gear fisheries.
- ◉ Considered a pest and most are discarded, although discard survival rates have been recorded as high as 98%.
- ◉ If landed, may be used for human consumption, fishmeal or pot bait<sup>iii</sup>.

## HANDLING

- ◉ Handle with care.
- ◉ Sharp teeth.
- ◉ Abrasive skin.

## EGGCASE

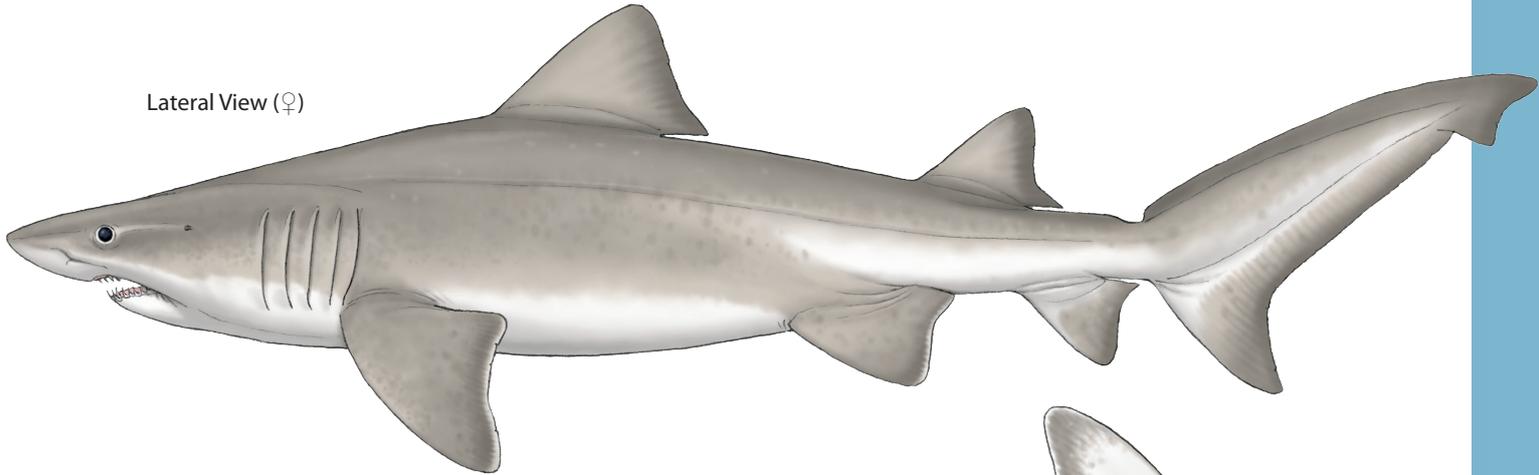
- 1 40mm long (excluding horns).
- 2 20mm wide.
- 3 Long tendrils at each corner<sup>i</sup>.
- 4 Similar eggcase to the Nursehound, *Scyliorhinus stellaris*.

## REFERENCES

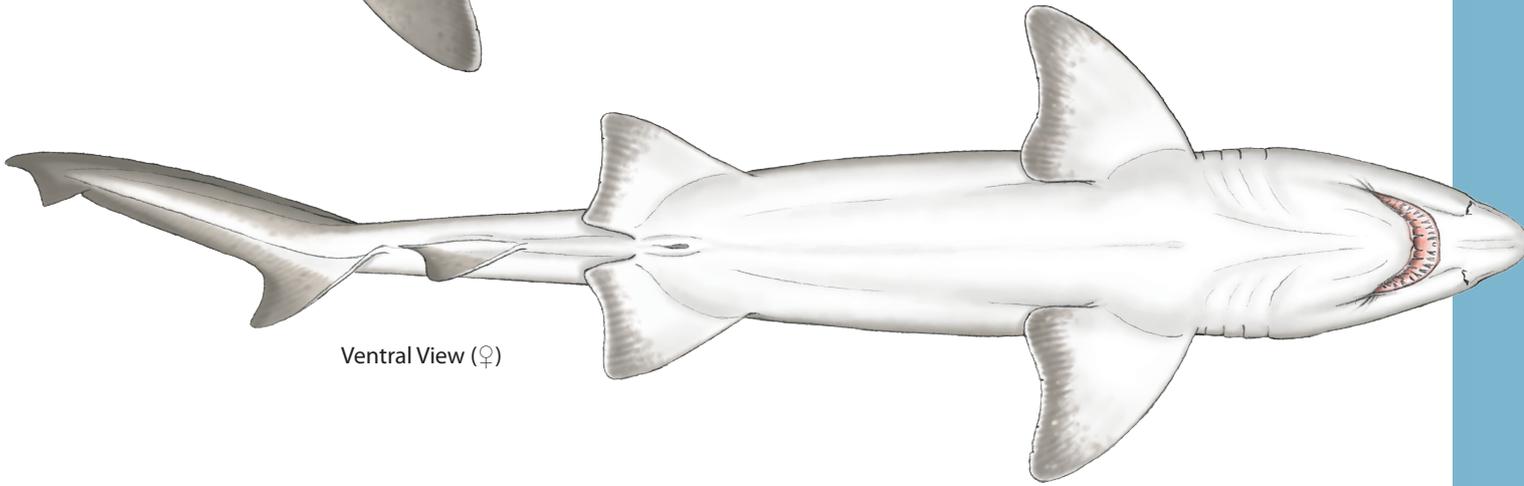
- i. Compagno, L. J. V.; 1984. *FAO*.
- ii. Ellis, J. R. *et al*; 1995. *J. Fish. Biol.*
- iii. Ellis, J. *et al*; 2008. *IUCN Red List*.
- iv. Gajić, A.; Unknown. *Shark Laboratory*.
- v. Ivory, P. *et al*; 2004. *Acta. Adriatica*.
- vi. Lyle, J. M.; 1983. *J. Fish. Biol.*
- vii. Metcalfe, J. D. *et al*; 1983. *J. Exp. Biol.*



Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Smalltooth Sandtiger Shark**, Raggedtooth Shark, Herbst's Nurse Shark, Requin Féroce (Fr), Solrayo (Es).

### SYNONYMS

*Squalus ferox* (Risso, 1810), *Carcharias ferox* (Risso, 1826), *Odontaspis herbsti* (Whitley, 1950).

### DISTRIBUTION



The Smalltooth Sandtiger Shark is possibly a circumglobal species in warm-temperate and tropical waters but is patchily distributed. In the eastern North Atlantic it is known from Madeira, Morocco, Western Sahara, the Bay of Biscay and the Mediterranean Sea (Algeria, Italy, Adriatic, Lebanon) (Compagno, 2001).

### APPEARANCE

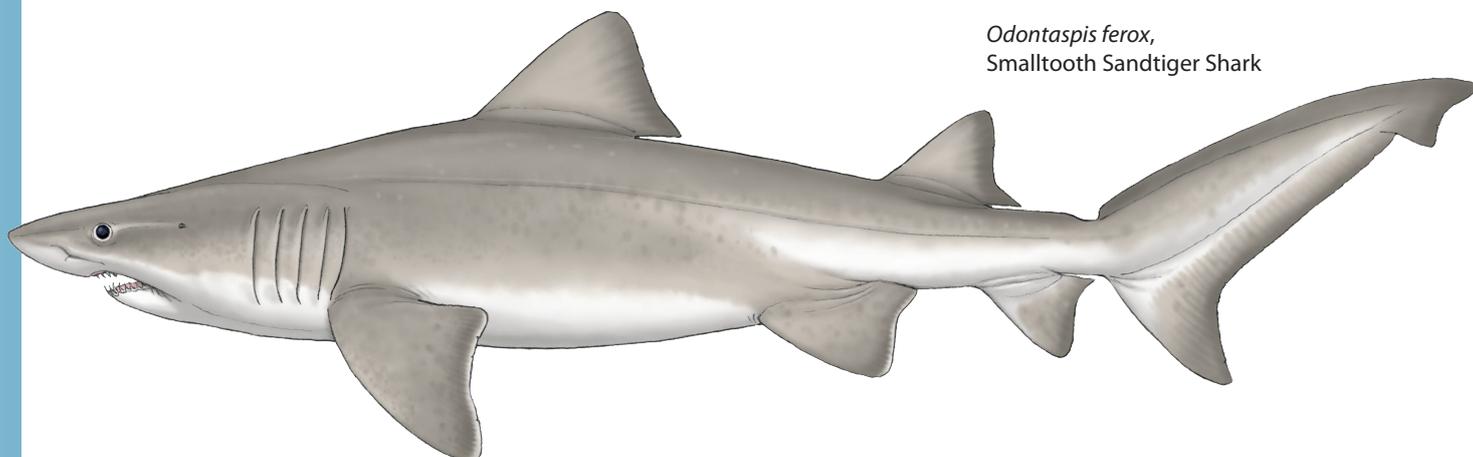
- Long, bulbously conical snout.
- Moderately large eyes.
- Mouth long, extending behind eyes.
- First dorsal fin closer to pectoral than pelvic fins.
- Pectoral fins angular.
- Anal, pelvic and second dorsal fins smaller than first dorsal fin.
- Caudal fin asymmetrical but with long ventral lobe.
- Medium grey or grey brown dorsally.
- Usually lighter ventrally.
- Dark spots sometimes scattered on body.

A large shark reaching 410cm total length, the Smalltooth Sandtiger Shark is similar in appearance to the Sandtiger Shark, *Carcharias taurus*. It has a long, bulbously conical snout, moderately large eyes and a long mouth extending behind the eyes. Its first dorsal fin is closer to the pectoral fins than the pelvic. The pectoral fins are broad based and angular. The second dorsal, pelvic and anal fins are smaller than the first dorsal fin but are still relatively large. The caudal fin is asymmetrical but with a long ventral lobe. The dorsal colouration is grey or grey brown, usually fading ventrally. Dark spots may be scattered across the body (Compagno, 2001).

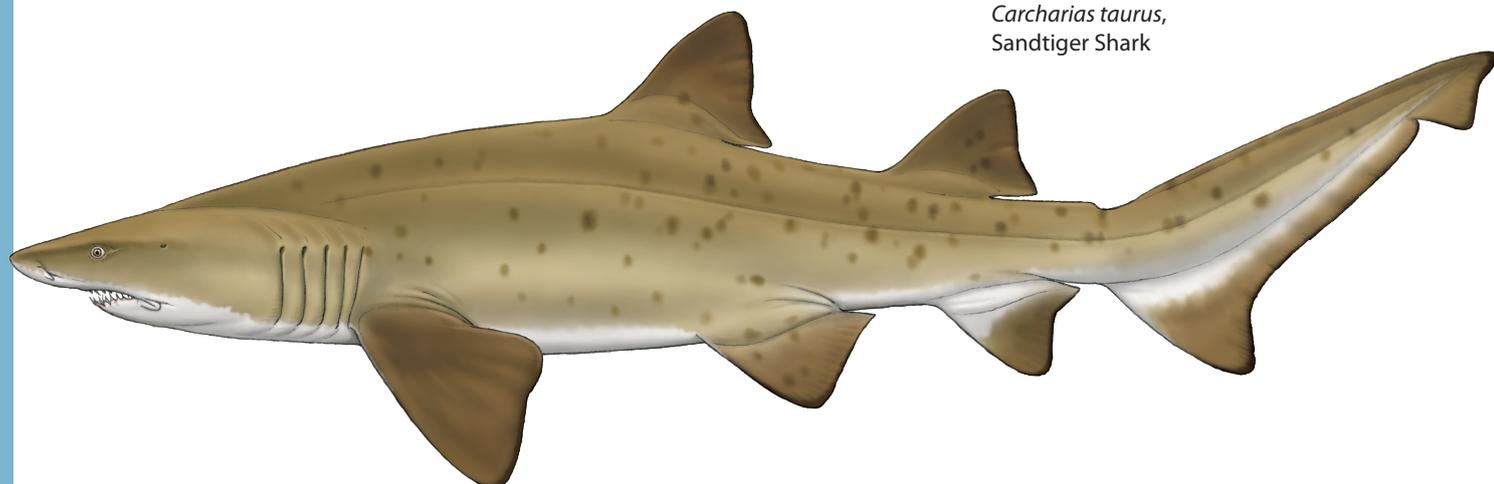


## SIMILAR SPECIES

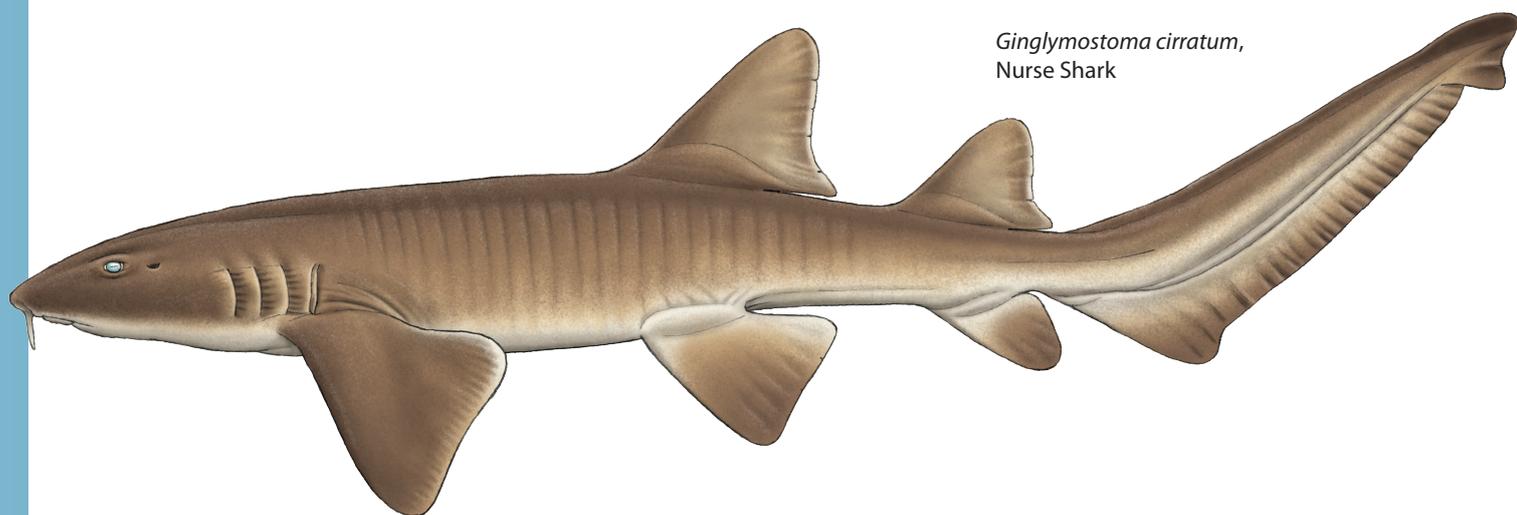
*Carcharias taurus*, Sandtiger Shark  
*Ginglymostoma cirratum*, Nurse Shark



*Odontaspis ferox*,  
Smalltooth Sandtiger Shark



*Carcharias taurus*,  
Sandtiger Shark

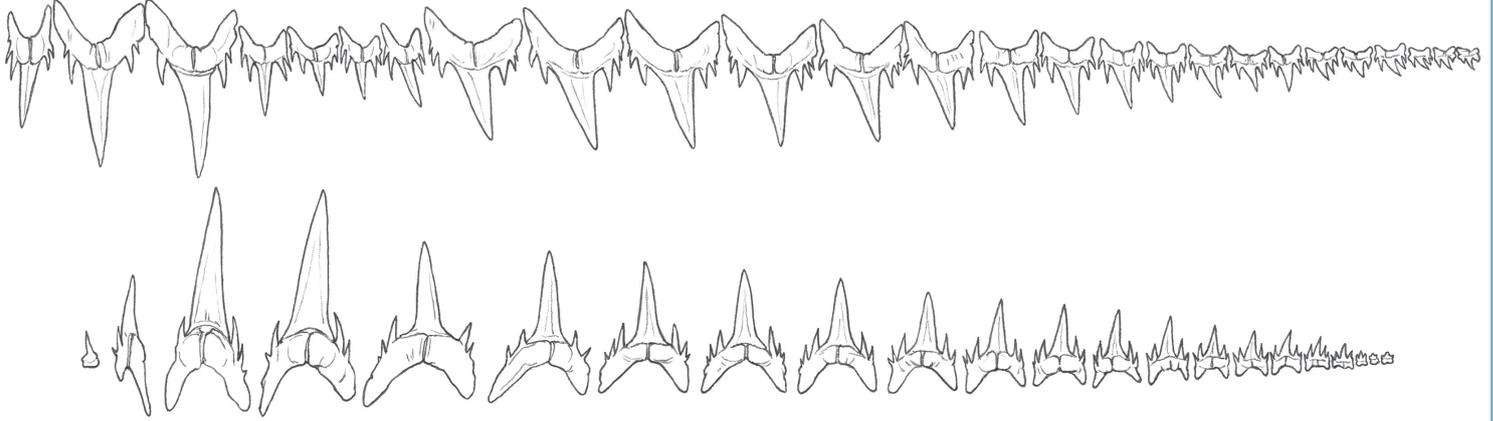


*Ginglymostoma cirratum*,  
Nurse Shark

(Not to scale)

### TEETH

The teeth are large with prominent narrow cusps and two or more pairs of lateral cusplets. The front teeth in the upper jaw are separated from the rear teeth by 2–5 rows of small intermediate teeth (Compagno, 2001).



### ECOLOGY AND BIOLOGY

#### HABITAT

Primarily a demersal species, the Smalltooth Sandtiger Shark is normally found in deep waters along continental shelves and upper slopes to at least 850m. It is occasionally found in shallow water and has been filmed at 20m in the Indian Ocean. There are three records in open, pelagic waters of the Indian Ocean. It can be seen solitarily or forming small aggregations (Pollard *et al.*, 2003).

#### EGGCASE

N/A

#### DIET

Examined stomachs from the Smalltooth Sandtiger Shark have contained small bony fish, squid and shrimp. Its dentition suggests it takes smaller, less active and softer-bodied prey than the similar Sandtiger Shark, *Carcharias taurus* (Compagno, 2001).

#### REPRODUCTION

Female Smalltooth Sandtiger Sharks mature at around 364cm, males at around 275cm. Little is known of its reproduction other than it is an ovoviparous species and the size at birth is above 105cm. Embryos may be nourished through oophagy but it is not known if it practices uterine cannibalism to the same extent as the Sandtiger Shark, *Carcharias taurus* (Compagno, 2001).

## COMMERCIAL IMPORTANCE

The Smalltooth Sandtiger Shark is fished in the Mediterranean and around Japan with gill nets, line gear and bottom trawls for its hide, liver oil and, to a lesser extent, its flesh. It is primarily taken as bycatch but can be targeted where it forms aggregations (Compagno, 2001)

## THREATS, CONSERVATION, LEGISLATION

Despite its worldwide distribution, populations of the Smalltooth Sandtiger Shark are fragmented and it may be naturally rare. Observations of shallow water aggregations may make the species more vulnerable to fisheries than previously thought and potentially vulnerable to habitat destruction. Off the east coast of Australia, fisheries observers have recorded declines of at least 50%, a situation thought to be similar across Australian and New Zealand waters. Although population data is lacking for the Mediterranean and northeast Atlantic, similar declines are inferred (Pollard *et al.*, 2003).

## IUCN RED LIST ASSESSMENT

Data Deficient (2003).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

### REFERENCES

COMPAGNO, L. J. V. 2001. Sharks of the World: An Annotated and Illustrated Catalogue of Shark Species Known to Date. Volume 2. Bullhead, Mackerel and Carpet Sharks (Heterodontiformes, Lamniformes and Orectolobiformes). FAO. Rome, Italy.

POLLARD, D., GORDON, I., WILLIAMS, S., FLAHERTY, A., FERGUSON, I. K. 2003. *Odontaspis ferox*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.1. [www.iucnredlist.org](http://www.iucnredlist.org).

Text: Richard Hurst.  
Illustrations: Marc Dando.

#### Citation

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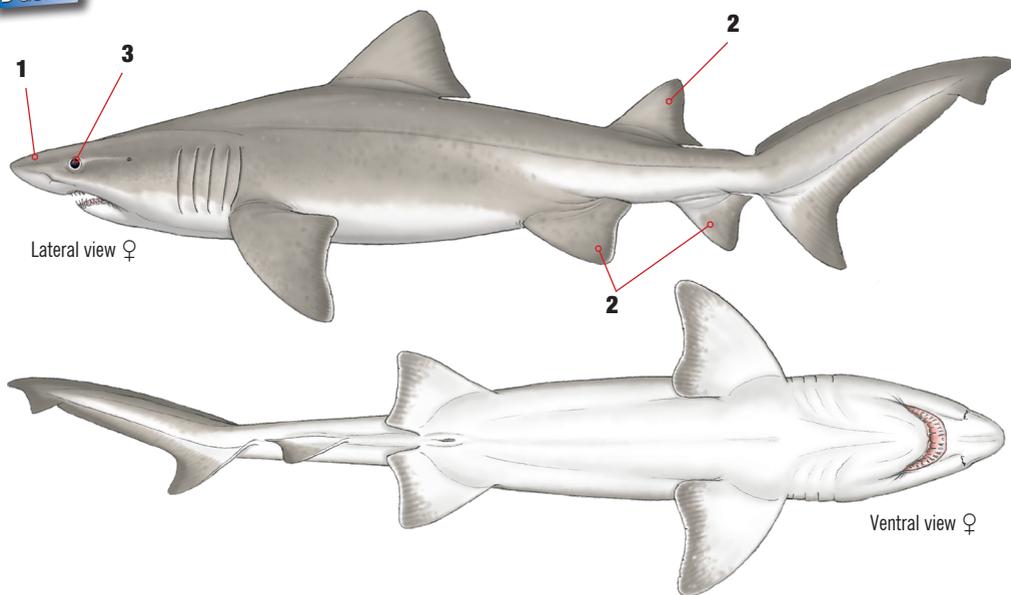
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# Smalltooth Sandtiger Shark *Odontaspis ferox*

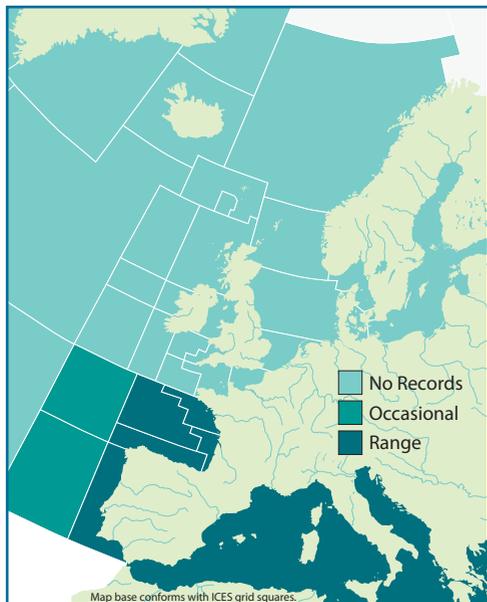


## SCIENTIFIC NAME

*Odontaspis ferox* (Risso, 1810).

## DISTRIBUTION

Possibly circumglobal in warm temperate and tropical waters. East Atlantic from the Bay of Biscay to Western Sahara, including the Mediterranean Sea<sup>1</sup>.



## COMMON NAME

**SMALLTOOTH SANDTIGER SHARK**, Raggedtooth Shark, Herbst's Nurse Shark, Requin Féroce (Fr), Solrayo (Es).

## IDENTIFICATION

- 1 Long, bulbously conical snout.
- 2 Second dorsal, pelvic and anal fins large.
- 3 Eyes moderately large<sup>1</sup>.

## COLOUR

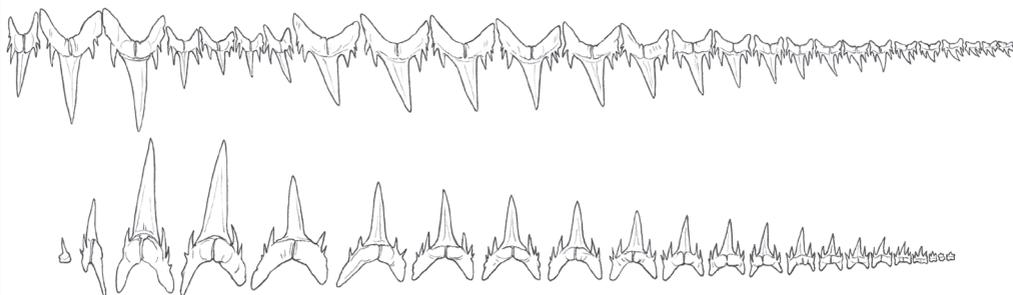
- Medium grey to brown dorsally.
- Similar but lighter to white ventrally.
- Sometimes dark spots scattered on body<sup>1</sup>.

## BIOLOGY AND SIZE

- Born: >105cm. Mature: 364cm ♀, 275cm ♂. Max TL: >410cm<sup>1</sup>.
- Little known of reproduction but could exhibit embryophagy as in the closely related Sandtiger Shark, *Carcharias taurus*.
- Known to feed on small bony fish, squid and shrimp<sup>1</sup>.

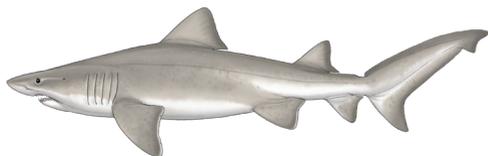


## TEETH

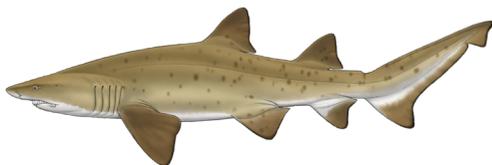


- Large with long, narrow cusps.
- Two or more pairs of lateral cusplets on each tooth<sup>i</sup>.

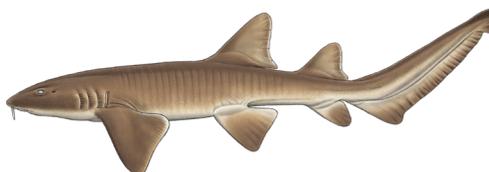
## SIMILAR SPECIES



- Odontaspis ferox*, Smalltooth Sandtiger Shark



- Carcharias taurus*, Sandtiger Shark



- Ginglymostoma cirratum*, Nurse Shark

## HABITAT

- On or near the bottom from 13–420m. Possibly found epipelagically 140–180m over the ocean floor<sup>i</sup>.
- Has recently been observed forming large aggregations in shallow waters<sup>ii</sup>.
- Has been reported from coral reef drop-offs by divers<sup>i</sup>.

## CONSERVATION STATUS

- Populations are fragmented and it may be naturally rare. Aggregations in shallow waters may make it more vulnerable to fishing pressure than previously thought<sup>i</sup>.
- Red List status:** Vulnerable (2008).

## COMMERCIAL IMPORTANCE

- Taken as bycatch in trawl, longline and gillnet fisheries, particularly in the Mediterranean Sea and off Japan.
- Most usually discarded. If retained fins, hides, flesh and large livers can be utilised<sup>i</sup>.

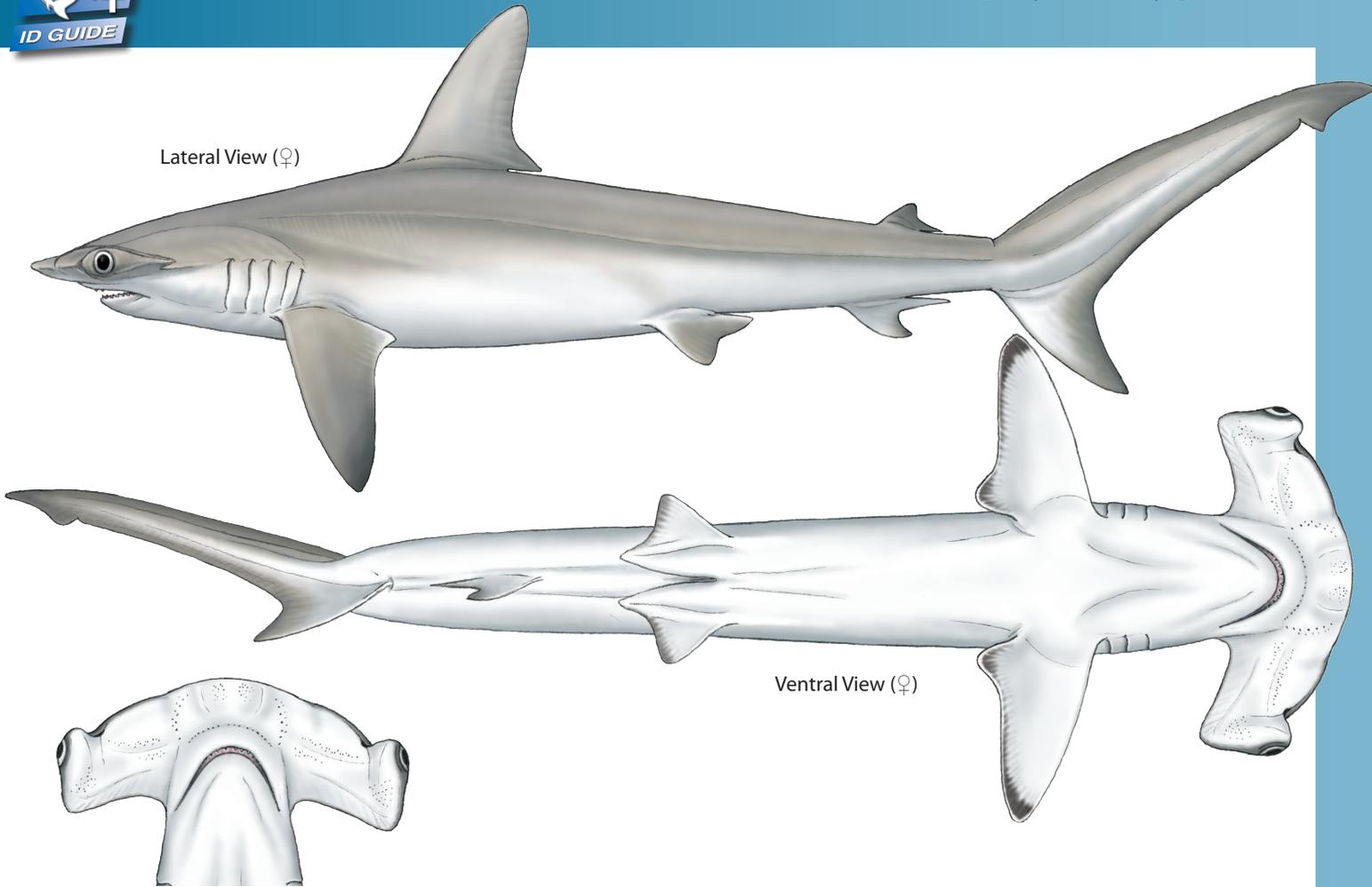
## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

- Compagno, L. J. V.; 2001. FAO.
- Pollard, D. *et al*; 2003. IUCN Red List.

Lateral View (♀)



Ventral View (♀)

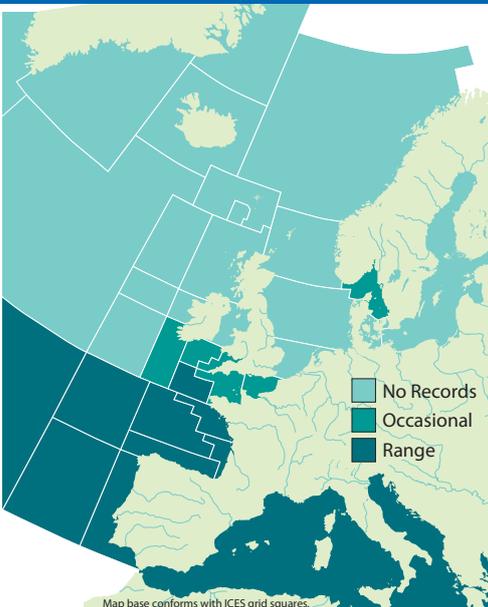
### COMMON NAMES

**Smooth Hammerhead Shark**, Common Hammerhead Shark, Round Headed Hammerhead Shark, Requin-Marteau Commun (Fr), Cornuda Cruz (Es).

### SYNONYMS

*Sphyrna lewini* (Griffith & Smith, 1834), *Squalis pictus* (Blainville, 1816), *Squalus carolinensis* (Blainville, 1816), *Sphyrna zygaena* (Linnaeus, 1758), *Spyrna zygaena* (Linnaeus, 1758), *Squalus malleus* (Valenciennes, 1822), *Squalus zygaena* (Linnaeus, 1758), *Zygaena malleus* (Valenciennes, 1822), *Zygaena subarcuata* (Storer, 1848), *Zygaena vulgaris* (Cloquet, 1830).

### DISTRIBUTION



The Smooth Hammerhead Shark has a widespread but patchy distribution in temperate and tropical waters worldwide. In the east Atlantic it is known from the southern British Isles to Senegal and the Ivory Coast, including the Mediterranean Sea. It is also known in the west Atlantic, the Indian Ocean and the Pacific (Compagno, 1984).

### APPEARANCE

- Broad, narrow-bladed cephalofoil with no median indentation.
- Moderately sized first dorsal fin.
- Second dorsal fin tiny and set above the anal fin.
- Small pelvic fins with almost straight posterior edges.
- Large, well developed caudal dorsal lobe with terminal notch.
- Dark olive to grey brown dorsally.
- White ventrally.
- Maximum total length reported to 500cm.

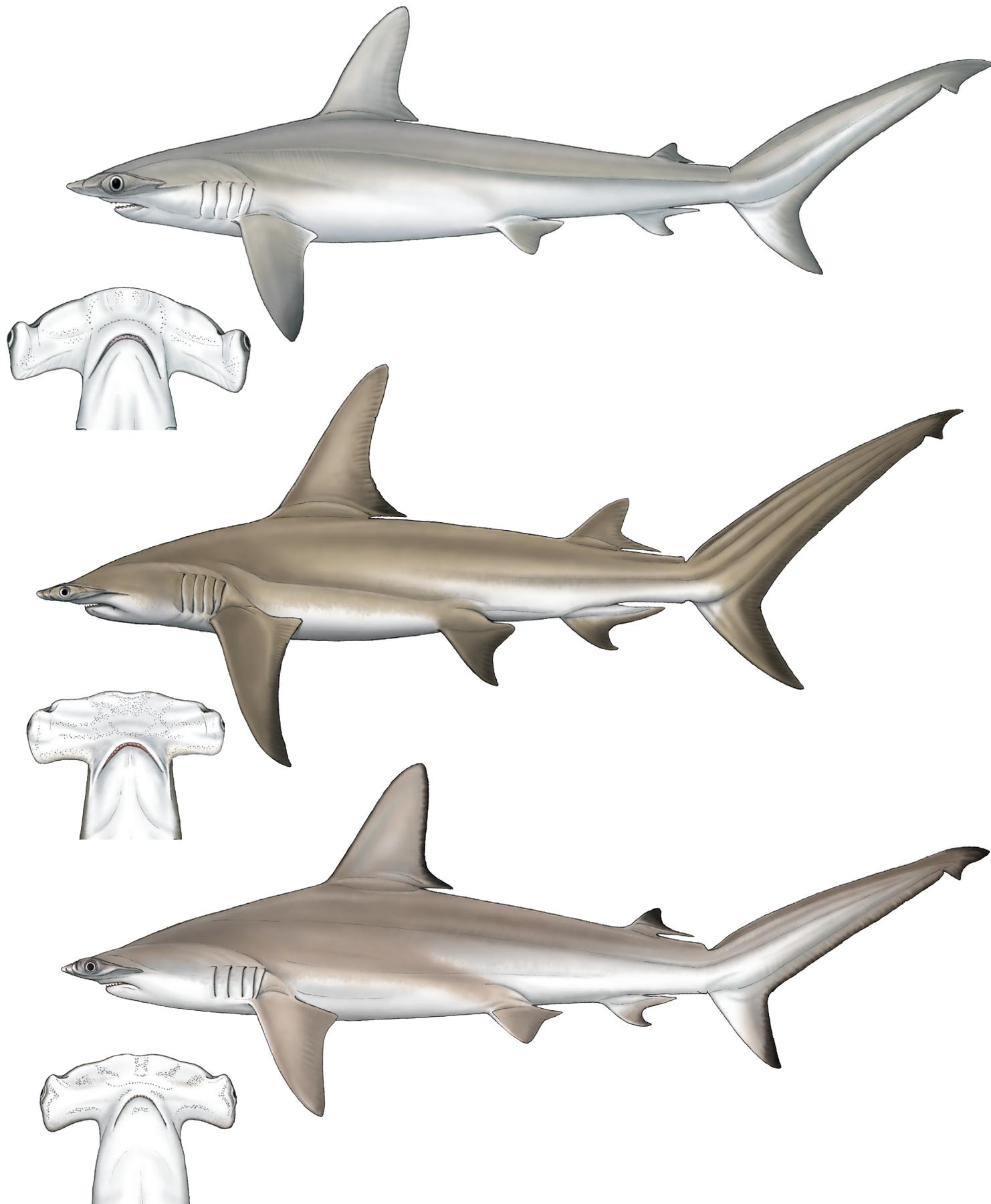
The Smooth Hammerhead Shark is an easily recognised large species. In European waters it could be confused with the Scalloped Hammerhead Shark, *Sphyrna lewini*, or the Great Hammerhead Shark, *Sphyrna mokarran*, although both of these species has an indent in the very centre of the leading edge of the cephalofoil, a feature the Smooth Hammerhead Shark lacks. The first dorsal fin is moderately sized with large free rear tips. It originates just behind the pectoral fins with the free rear tip ahead of the pelvic fins. The pelvic fins are small and square. The second dorsal fin is tiny, comparable in size to the anal fin over which it is positioned. The dorsal lobe of the caudal fin is large and well developed with a strong terminal notch (Compagno, 1984).

Dorsal colouration is from dark olive to dark grey with no patterning, although some individuals have dusky or black edged fins. It is white ventrally. There are reports of the Smooth Hammerhead Shark reaching 500cm in length, although 250-350cm individuals are more common (Bester, Unknown).

## SIMILAR SPECIES

*Sphyrna lewini*, Scalloped Hammerhead Shark

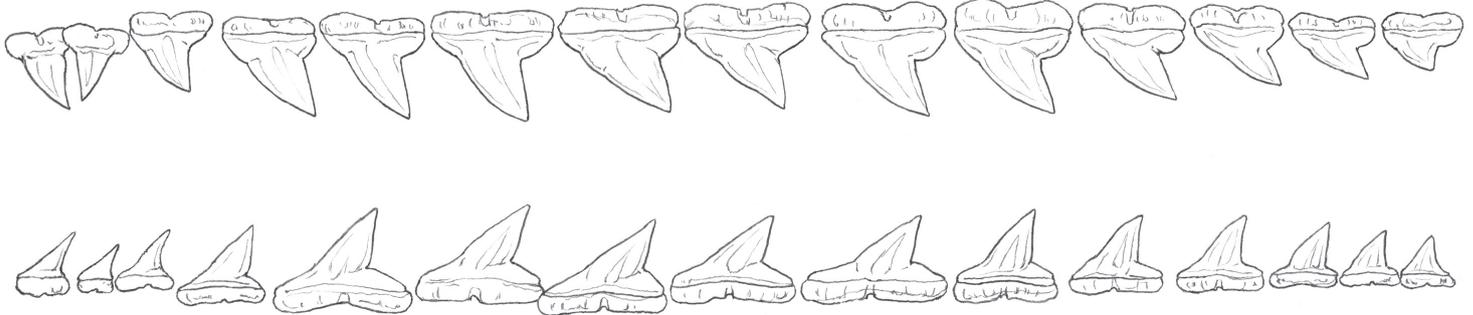
*Sphyrna mokarran*, Great Hammerhead Shark



(Not to scale)

### TEETH

The teeth have very broad cusps with smooth or weakly serrated edges (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Smooth Hammerhead Shark is found close inshore and over the continental shelf to depths of at least 200m, although it prefers to stay shallower than 20m. While it is more tolerant of temperate waters than any other hammerhead shark, it does make migrations towards warmer waters in the winter. This is reversed in the summer and it migrates towards the poles into cooler water. During these migrations adults may form small groups, and young sharks less than 1.5m in length are known to form enormous schools. It is usually a solitary animal however. It has been known to enter freshwater on occasion (Bester, Unknown).

#### REPRODUCTION

Like Carcharinidae and other Sphyrnidae species, the Smooth Hammerhead Shark reproduces through placental, or yolk-sac, viviparity. For about the first third of the gestation period, the embryos are nourished by a yolk supply in a very similar way to the 60% of elasmobranchs which reproduce through normal viviparity. However once this yolk supply is used up the yolk-sac changes, becoming more folded and wrinkled. It now interlocks with the lining of the mother's uterus. The blood supply to both the yolk-sac and the uterus wall increases allowing nutrients and oxygen to pass from the mother to the embryo and vice versa for waste, very much like a mammalian placenta (Martin, 1994).

Female Smooth Hammerhead Sharks reach sexual maturity at around 270cm in length, males at around 210–250cm. Mating and birth both occur during the summer with a gestation period of 10–11 months. Litters of 20–40 pups have been reported with each pup measuring around 50cm in length at birth. It gives birth in inshore nursery areas such as lagoons and estuaries where the young form large schools (Bester, Unknown).

#### DIET

A 1999 study showed that cephalopods constitute (68.9%) of the diet of the Smooth Hammerhead Shark, followed by teleost fish (29.8%) with small amounts of other chondrichthyans and benthic invertebrates (mostly crustaceans) (Cortés, 1999). However, other studies have shown them to be primarily piscivores with a preference for other elasmobranchs, especially in inshore areas (Bester, Unknown). Compagno (1984) lists the main prey items as herring, menhaden, sea catfishes, sea bass, mackerel, porgies and also small sharks, skates, stingrays, shrimp, crabs, barnacles, squid and other cephalopods (Compagno, 1984).

## COMMERCIAL IMPORTANCE

A common and fairly abundant species, the Smooth Hammerhead Shark is taken with pelagic longlines, handlines and pelagic and bottom trawls. Its meat is not considered to be high quality but it is used fresh, dried salted and smoked for human consumption. Its hide is used for leather, its liver oil for vitamins and its fins are highly prized for sharkfin soup. Its carcass can also be processed for fishmeal (Compagno, 1984).

## THREATS, CONSERVATION, LEGISLATION

While the Smooth Hammerhead Shark is an abundant and widespread species, population trends are poorly understood and fishing mortality is likely to be significant. While there are few targeted fisheries, it is taken as bycatch across its range by longline, handline and trawl fisheries. Due to the high value of its fins, animals taken as bycatch are unlikely to be returned alive (Casper *et al.*, 2005).

## IUCN RED LIST ASSESSMENT

Vulnerable (2005).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Large, powerful shark.
- Sharp teeth and abrasive skin.

### REFERENCES

- BESTER, C. Unknown. Smooth Hammerhead. Florida Museum of Natural History. [www.flmnh.ufl.edu/fish/](http://www.flmnh.ufl.edu/fish/).
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Text: Richard Hurst.  
Illustrations: Marc Dando.

#### Citation

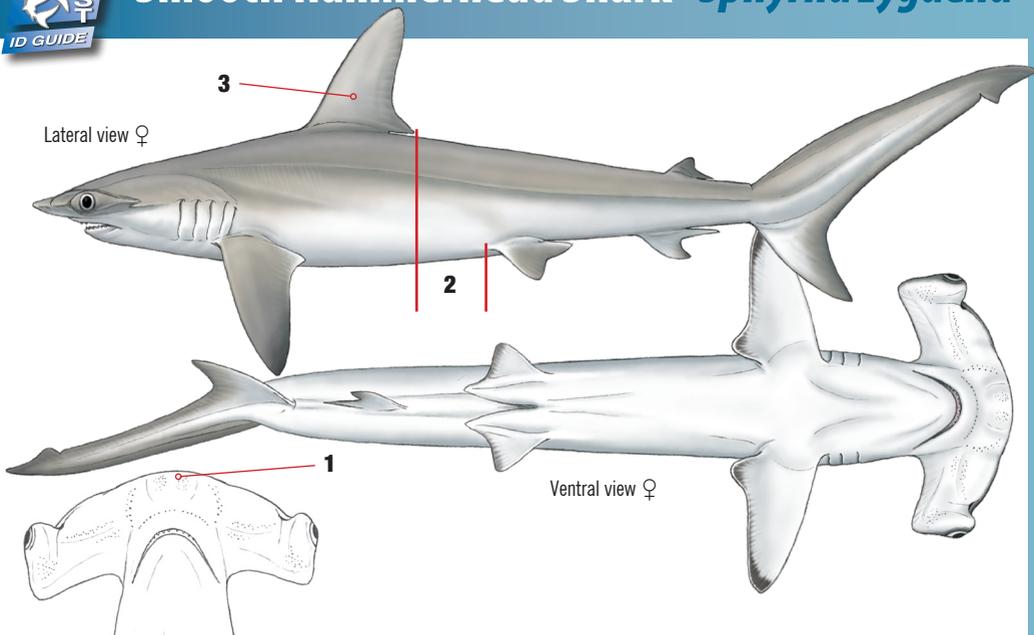
Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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For more ID materials visit [www.sharktrust.org/ID](http://www.sharktrust.org/ID).

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# Smooth Hammerhead Shark *Sphyrna zygaena*

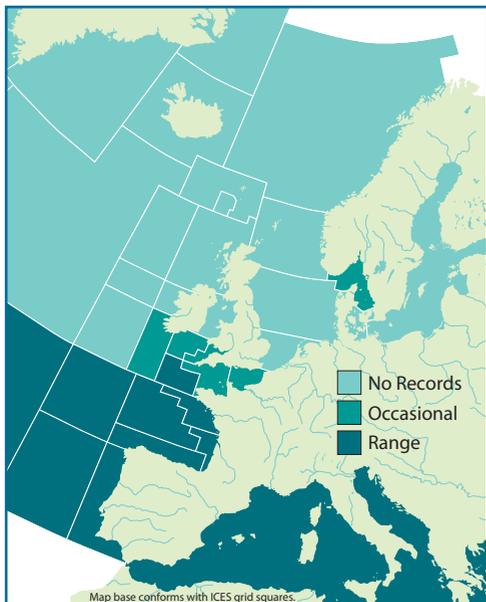


## SCIENTIFIC NAME

*Sphyrna zygaena* (Linnaeus 1758).

## DISTRIBUTION

Circumglobal in tropical and temperate seas. East Atlantic from the southern British Isles to the Ivory Coast, including the Mediterranean Sea<sup>ii</sup>. Single western Baltic record.



## COMMON NAME

**SMOOTH HAMMERHEAD SHARK**, Common Hammerhead Shark, Round Headed Hammerhead Shark, Requin-Marteau Commun (Fr), Cornuda Cruz (Es).

## IDENTIFICATION

- 1** Broad cephalofoil with no median indentation.
- 2** First dorsal fin in front of pelvic fins.
- 3** Moderately sized first dorsal fin<sup>iii</sup>.

## COLOUR

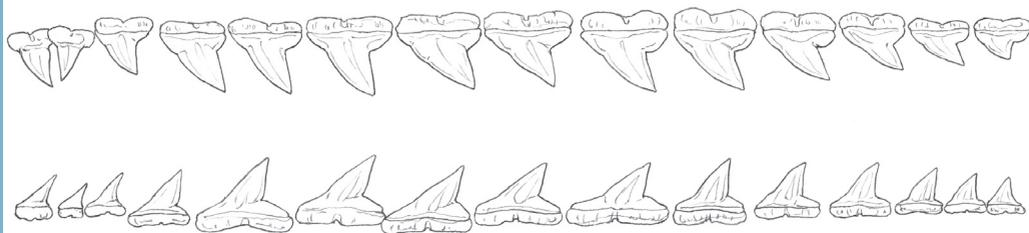
- Dark olive to grey brown dorsally.
- Ventrally white.
- May have dark edged pectoral fins<sup>i</sup>.

## BIOLOGY AND SIZE

- Born: 50cm. Mature: 270cm ♀, 210–250cm ♂. Max TL: 500cm<sup>i</sup>.
- Litters of 20–40 pups have been recorded after gestation periods of 10–11 months<sup>i</sup>.
- Primarily a piscivore feeding on teleost fish and other elasmobranchs<sup>i</sup>. Cephalopods and crustaceans are also important prey items<sup>iii</sup>.



## TEETH

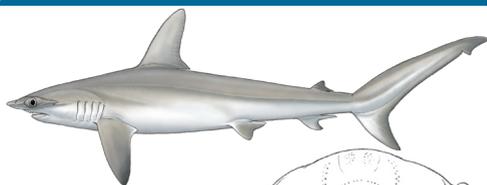


- Very broad cusps.
- Smooth or weakly serrated edges<sup>ii</sup>.

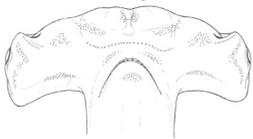
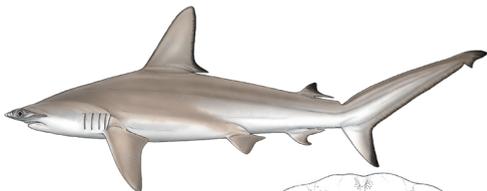
## HABITAT

- Inshore and shelf waters from the surface to at least 200m, prefer water <20m.
- Migrate south in winter and north in summer. Adults may form small groups during migrations, juveniles form enormous schools.
- Have been two reports of the species from freshwater<sup>ii</sup>.

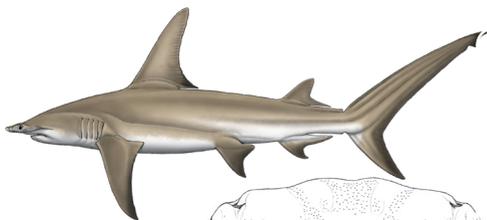
## SIMILAR SPECIES



- Sphyrna zygaena* **Smooth Hammerhead Shark**



- Sphyrna lewini*, **Scalloped Hammerhead Shark**



- Sphyrna mokarran*, **Great Hammerhead Shark**

## CONSERVATION STATUS

- Populations are poorly understood but are likely to have been significantly impacted by fishing. Hammerhead shark populations have declined greatly in the Mediterranean<sup>iv</sup>.
- Red List status:** Near Threatened (2000).

## COMMERCIAL IMPORTANCE

- No targeted fishery but taken as bycatch in longline, handline and trawl fisheries across its range<sup>iv</sup>.
- Fins are very valuable, any sharks taken as bycatch are likely to be retained.
- Meat is low quality but can be eaten. Hides can be used for leather, liver for oil and carcasses for fishmeal<sup>iii</sup>.

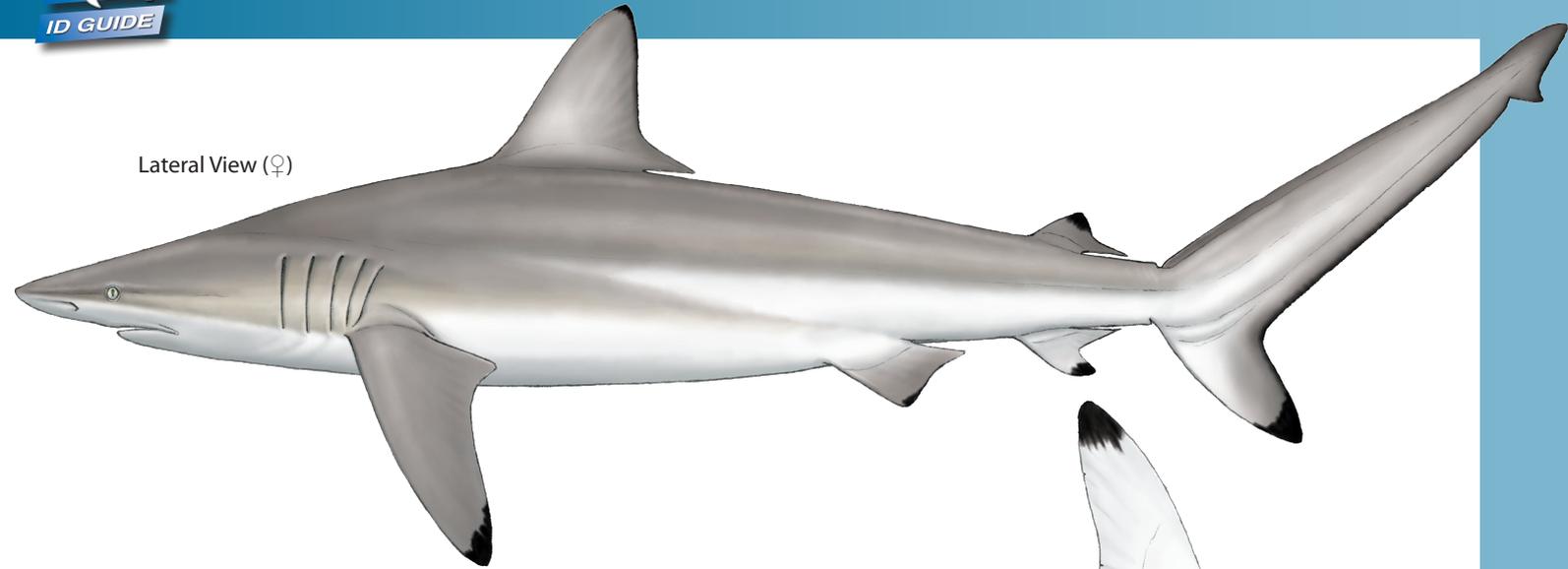
## HANDLING

- Handle with care.
- Large, powerful shark.
- Sharp teeth and abrasive skin.

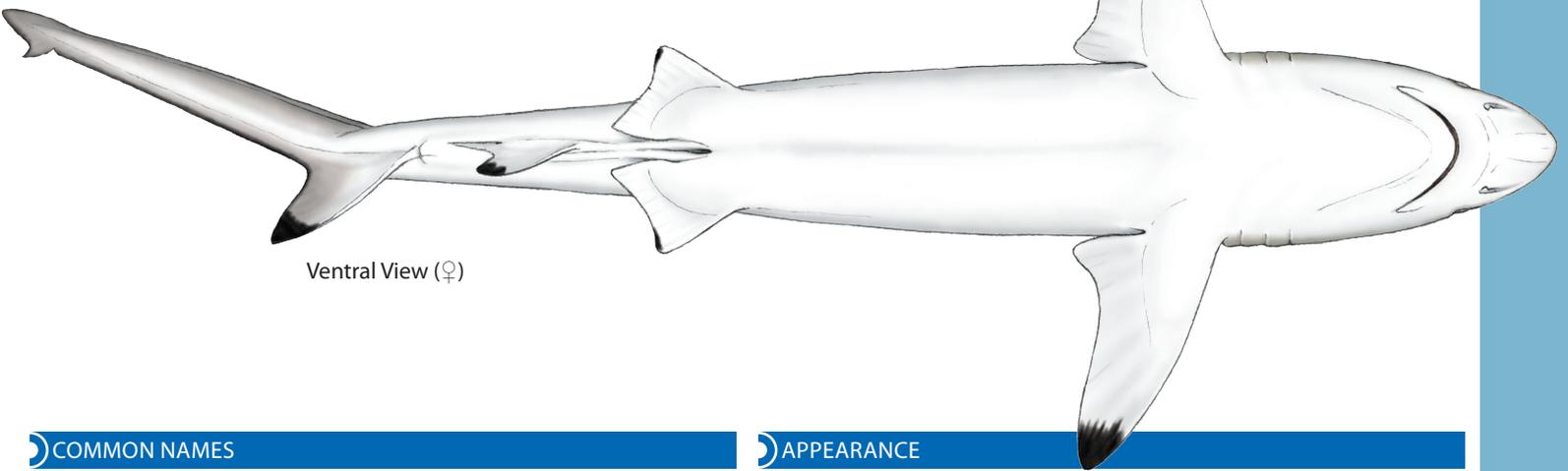
## REFERENCES

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- Casper, B. M. *et al*; 2005. IUCN Red List.
- Compagno, L. J. V; 1984. FAO.
- Ferretti, F. *et al*; 2008. Conservation Biology.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Spinner Shark**, Blacktipped Shark, Great Blacktip Shark, Large Blacktip Shark, Long-nose Grey Shark, Requin Tisserand (Fr), Tiburón Aleta Negra (Es).

### SYNONYMS

*Carcharias brevipinna* (Müller & Henle, 1839), *Aprionodon brevipinna* (Müller & Henle, 1839), *Isogomphodon maculipinnis* (Poey, 1865), *Carcharhinus maculipinnis* (Poey, 1865), *Uranga nasuta* (Whitley, 1943), *Longmania calamaria* (Whitely, 1944), *Carcharhinus johnsoni* (Smith, 1951), *Aprionodon caparti* (Poll, 1951), *Carcharhinus johnsoni* (Smith, 1951).

### DISTRIBUTION



The Spinner Shark is thought to occur worldwide in warm temperate and subtropical waters with the exception of the eastern Pacific. In the east Atlantic it is known from Spain to Namibia, including the southern Mediterranean Sea. Confusion with the Blacktip Shark, *Carcharhinus limbatus*, means that records are likely incomplete (Bester, Unknown).

### APPEARANCE

- Long, pointed snout with small eyes.
- Prominent upper labial furrows, longer than any other *Carcharhinus* species.
- Long gill slits.
- No interdorsal ridge.
- Small pectoral fins.
- Small first dorsal fin with short free rear tip.
- Moderately large second dorsal fin with short free rear tip.
- Black tips to dorsal, pectoral, anal and ventral caudal fins.

A large, fairly slender shark, the Spinner Shark can be confused with many others in the genus, particularly the Blacktip Shark, *Carcharhinus limbatus*. However, it is the only *Carcharhinus* species found in the North Atlantic with a black tip to the anal fin. The pectoral and dorsal fins also have black tips, as does the ventral lobe of the caudal fin. The first dorsal fin is small with a short free rear tip. The second dorsal fin is moderately large (although much smaller than first) and also has a short free rear tip. The pectoral fins are small (Compagno, 1984). The upper labial furrows are extremely prominent, the longest of any *Carcharhinus* species (Compagno *et al.*, 2005).

Colouration is grey to bronze dorsally fading to white ventrally with a faint white band on the sides. The second dorsal, anal, lower caudal and pectoral fins have black or dark grey tips in adults and older juveniles. The pelvic, first dorsal and upper caudal fins may also have black tips. The fins are unmarked in young individuals (Bester, Unknown).

## SIMILAR SPECIES

*Carcharhinus brachyurus*, Copper Shark

*Carcharhinus falciformis*, Silky Shark

*Carcharhinus obscurus*, Dusky Shark

*Carcharhinus plumbeus*, Sandbar Shark

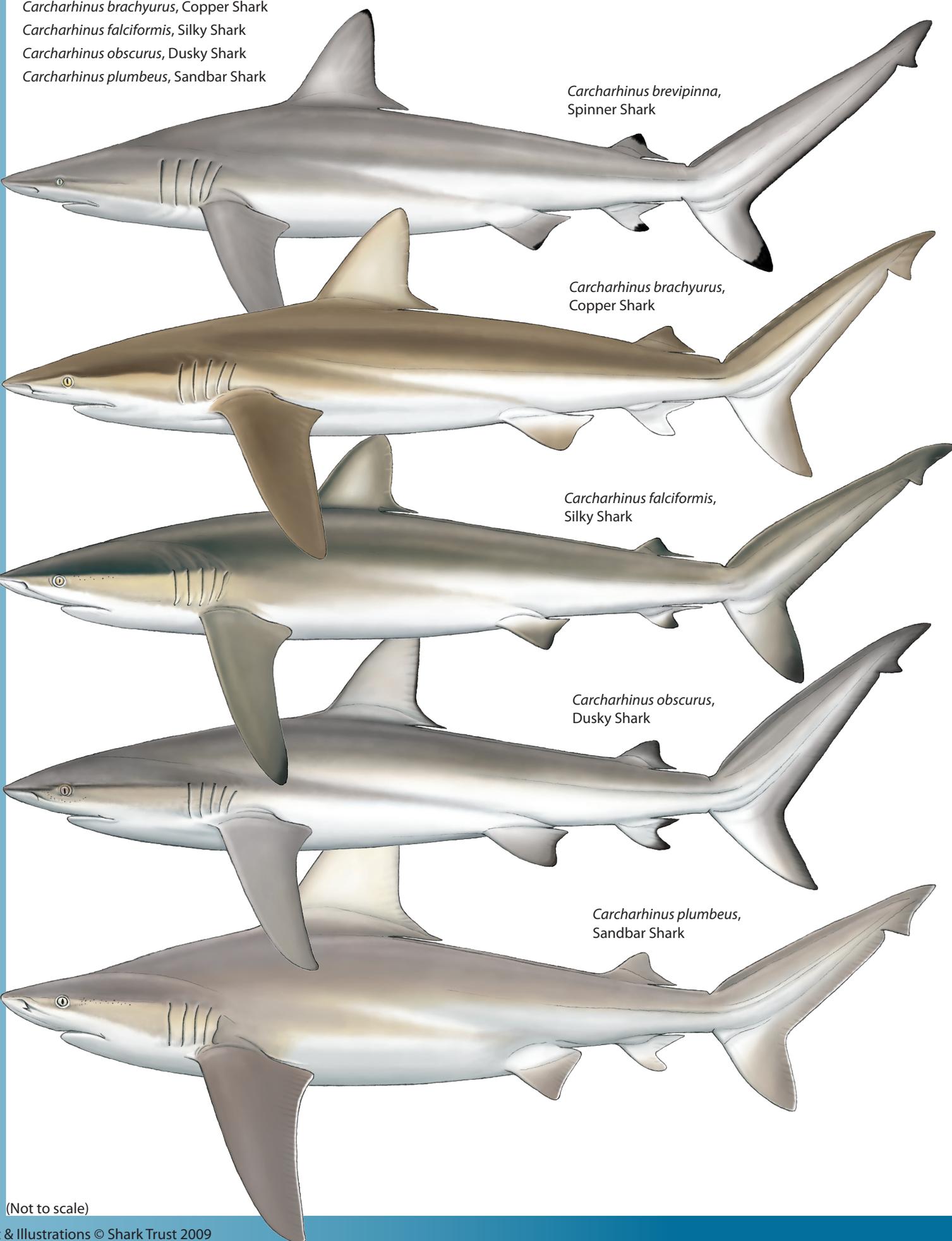
*Carcharhinus brevipinna*,  
Spinner Shark

*Carcharhinus brachyurus*,  
Copper Shark

*Carcharhinus falciformis*,  
Silky Shark

*Carcharhinus obscurus*,  
Dusky Shark

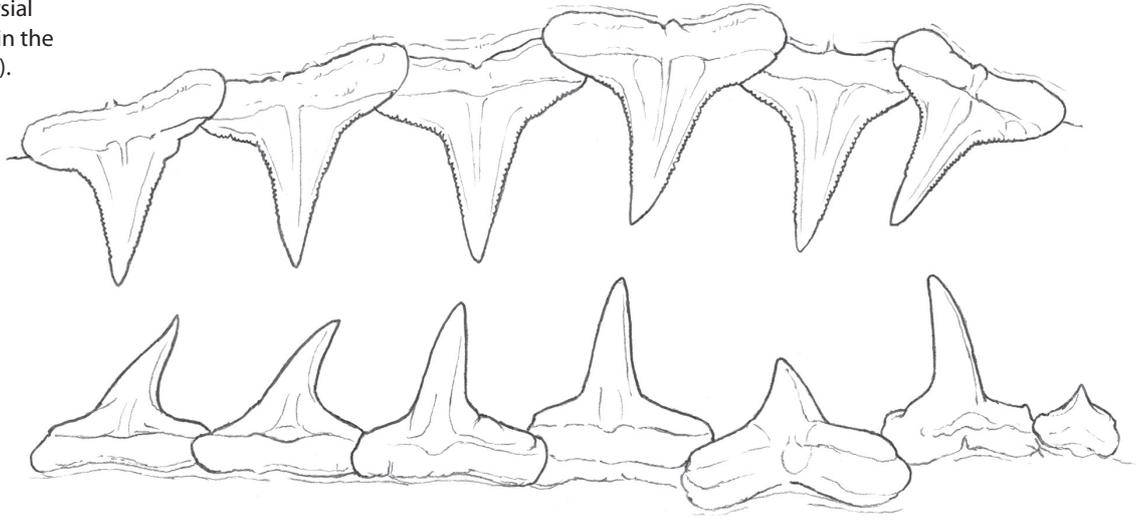
*Carcharhinus plumbeus*,  
Sandbar Shark



(Not to scale)

### TEETH

14–18 broad based teeth with narrow cusps in both jaws. The upper teeth are finely serrated. There are two small symphyseal teeth in the upper jaw, one in the lower jaw (Bester, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Spinner Shark is known from continental and insular shelves from the surface to depths of 100m. It is known to form schools and is highly migratory off the east coast of North America, moving inshore during spring and summer to reproduce and feed. Juveniles are known to remain inshore and to move into lower portions of bays of bays with the tide, although they avoid areas of low salinity (Bester, Unknown).

#### EGGCASE

N/A

#### DIET

The Spinner Shark is known to eat a large variety of pelagic bony fish as well as demersal teleost fish, elasmobranchs and molluscs. Compagno (1984) lists these as ten-pounders, sardines and herrings, anchovies, sea catfish, lizardfish, mullets, bluefish, tunas, bonito, croakers, jacks, mojarras, grunts, tongue-soles, stingrays, cuttlefish, squid and octopi (Compagno, 1984).

When preying on schooling fishes, the Spinner Shark employs an unusual feeding method. Swimming rapidly upwards through the shoal, it spins along its longitudinal axis snapping at the fish as it goes. At the end of the run it often breaks the surface, sometimes breaching in spectacular fashion. This behaviour has also been reported from the Blacktip Shark, *Carcharhinus limbatus*, but to a lesser extent (Compagno, 1984).

#### REPRODUCTION

Female Spinner Sharks mature around 170–200cm, males around 160–200cm. It is a viviparous species with nourishment provided to the embryos by a yolk-sac placenta. The gestation period is between 12 and 15 months, at the end of which females move inshore to give birth, usually during the summer months. 3–15 pups are born in each litter, each measuring 60–75cm. These pups immediately move into shallow estuarine waters for food and protection from larger predators (Bester, Unknown).

## COMMERCIAL IMPORTANCE

Taken primarily as bycatch of pelagic longline fisheries, the Spinner Shark is also targeted in commercial shark fisheries across much of its range. The fins are valuable for sharkfin soup, the flesh can be utilised fresh or preserved for human consumption and the hide can be used for leather. It is a sought after game fish by recreational anglers for its habit of making spectacular spinning leaps when hooked (Bester, Unknown).

## THREATS, CONSERVATION, LEGISLATION

The Spinner Shark is regularly taken in commercial and recreational fisheries, both inshore and offshore. Its meat and fins are highly valuable and its hide can be used for leather. As it frequents inshore waters both to feed and breed, it is vulnerable to pollution and habitat destruction (Burgess, 2000).

## IUCN RED LIST ASSESSMENT

Near Threatened (2000).

## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

- BESTER, C. Unknown. Spinner Shark. Florida Museum of Natural History. [www.flmnh.ufl.edu/fish/](http://www.flmnh.ufl.edu/fish/).
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Text: Richard Hurst.  
Illustrations: Marc Dando.

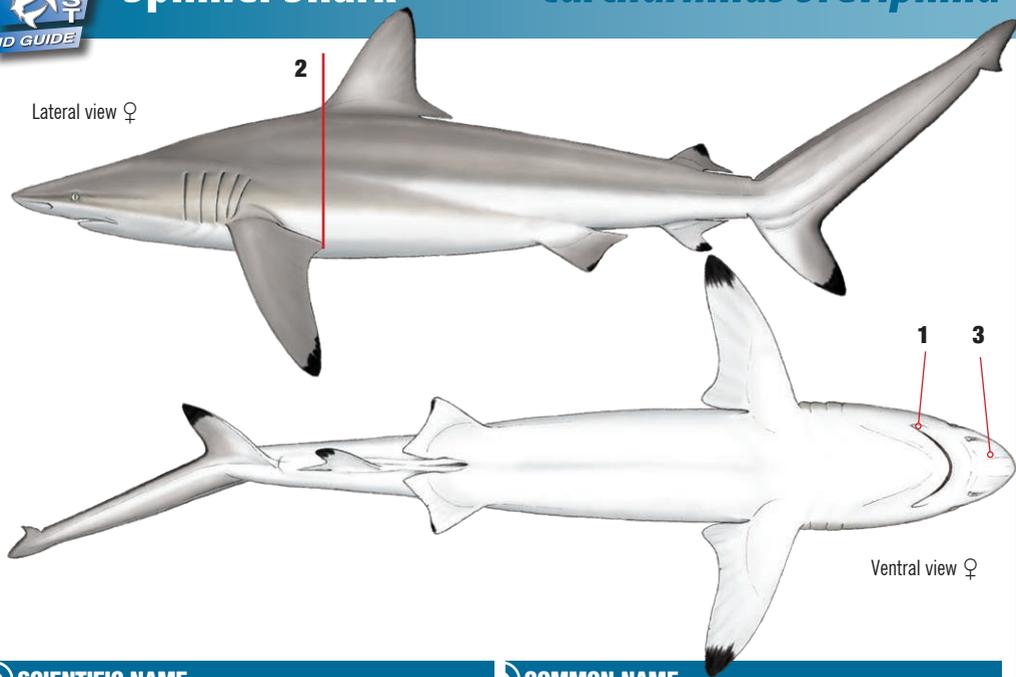
### Citation

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Lateral view ♀

Ventral view ♀

## SCIENTIFIC NAME

*Carcharhinus brevipinna* (Müller & Henle, 1839).

## DISTRIBUTION

Poorly understood due to species confusion but found almost worldwide. East Atlantic from Spain to Namibia, including the southern Mediterranean Sea<sup>1</sup>.



## COMMON NAME

**SPINNER SHARK**, Blacktipped Shark, Great Blacktip Shark, Long-nose Grey Shark, Requin Tisserand (Fr), Tiburón Aleta Negra (Es).

## IDENTIFICATION

- 1 Prominent labial furrows, longer than any other *Carcharhinus* species.
- 2 First dorsal fin over or just behind pectoral fin rear tips.
- 3 Snout pointed, as long as or longer than width of mouth.

## COLOUR

- Grey to bronze dorsally.
- Faint white band on flanks.
- All fins except the upper caudal may have dark tips.
- Fins unmarked in very young<sup>1</sup>.

## BIOLOGY AND SIZE

- Born: 60–75cm. Mature: 170–200cm ♀, 159–203cm ♂. Max TL: 278cm<sup>ii</sup>.
- Gestation period 12–15 months, litters of 3–15 have been recorded<sup>ii</sup>.
- Feeds on a wide variety of teleost fish, elasmobranchs, molluscs and cephalopods<sup>ii</sup>.



## TEETH

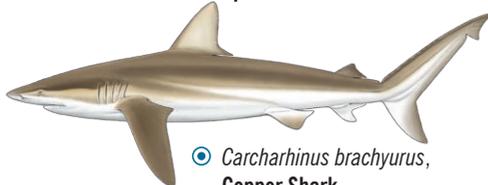
- 14–18 broad based teeth with narrow cusps in both jaws.
- Upper teeth finely serrated.
- Two small symphyseal teeth in upper jaw, one in the lower jaw<sup>i</sup>.



## SIMILAR SPECIES



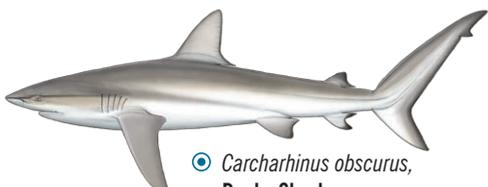
*Carcharhinus brevipinna*,  
**Spinner Shark**



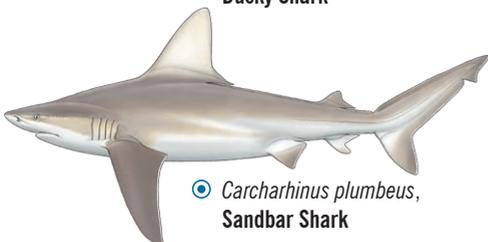
*Carcharhinus brachyurus*,  
**Copper Shark**



*Carcharhinus falciformis*,  
**Silky Shark**



*Carcharhinus obscurus*,  
**Dusky Shark**



*Carcharhinus plumbeus*,  
**Sandbar Shark**

## HABITAT

- Found inshore to at least 100m throughout the water column.
- Highly migratory in the western Atlantic moving inshore to reproduce and feed in warmer months.
- Often seen leaping from the water and spinning in pursuit of prey<sup>i</sup>.

## CONSERVATION STATUS

- Frequently taken in commercial and recreational fisheries across its range. Uses inshore nursery areas so is vulnerable to habitat destruction and pollution<sup>i</sup>.
- Red List status:** Near Threatened (2000).

## COMMERCIAL IMPORTANCE

- Taken as bycatch in pelagic longline fisheries.
- Fins are valuable, meat and skin also utilised.
- Sought by recreational anglers due to its habit of spinning and breaching when hooked<sup>i</sup>.

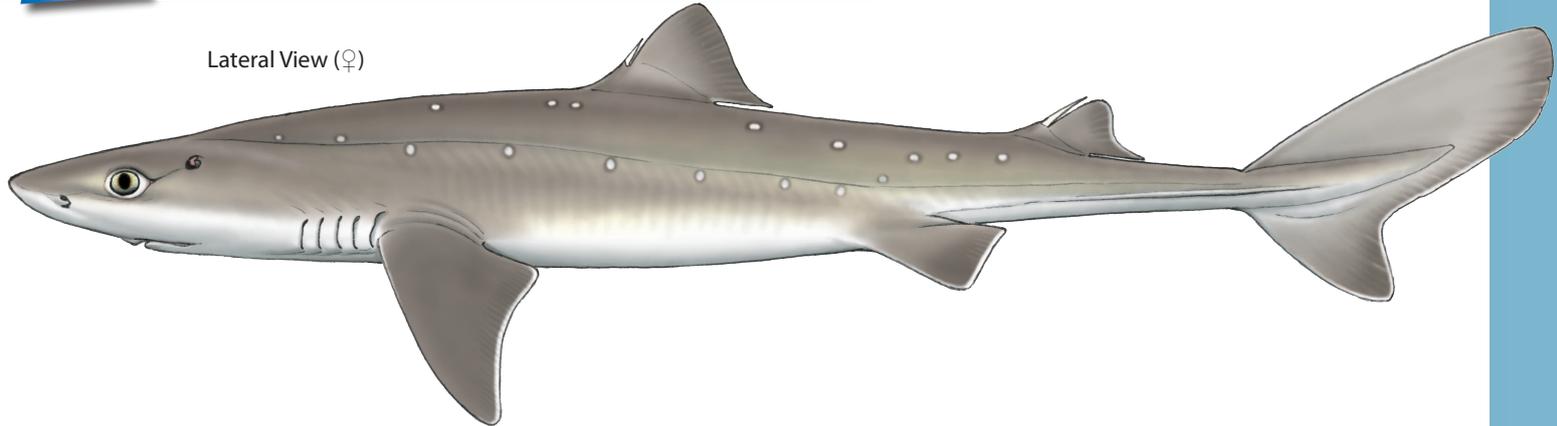
## HANDLING

- Handle with care.
- Sharp teeth.
- Abrasive skin.

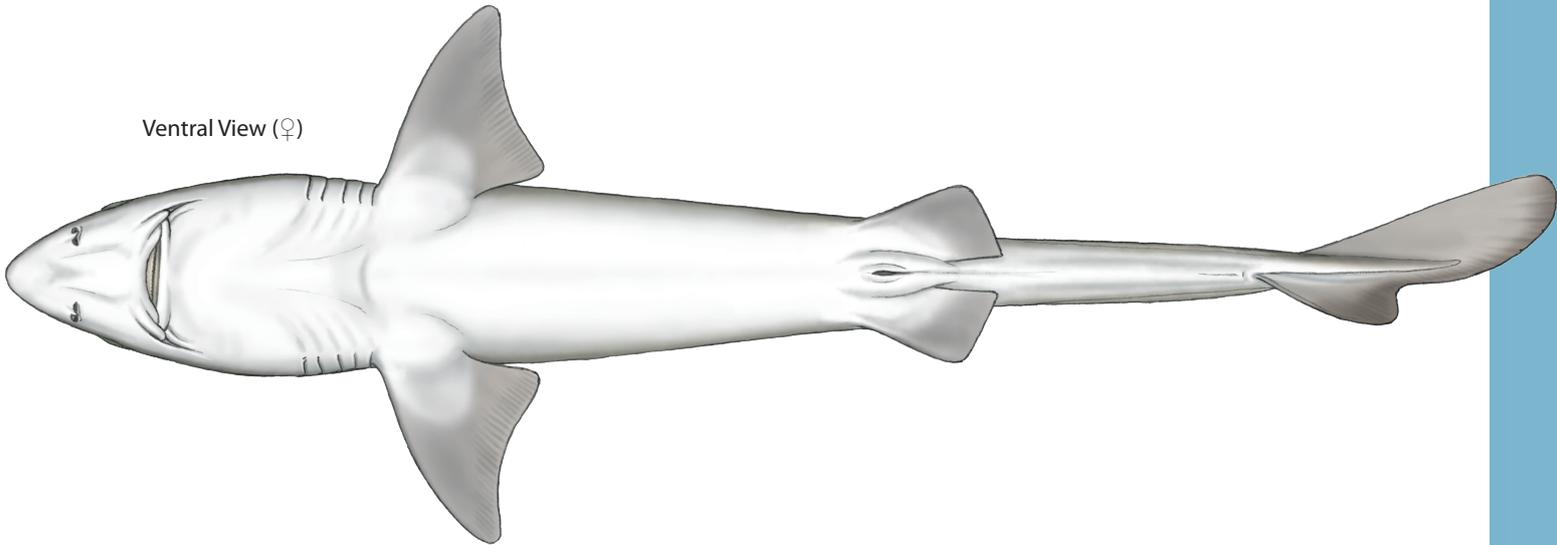
## REFERENCES

- Bester, C; Unknown. FLMNH.
- Compagno, L. J. V.; 1984. FAO.

Lateral View (♀)



Ventral View (♀)



### SYNONYMS

*Squalus spinax* (Olivius, 1780), *Squalus fernandinus* (Molina, 1782), *Acanthias antiquorum* (Leach, 1818), *Acanthias vulgaris* (Risso, 1826), *Acanthias americanus* (Storer, 1846), *Spinax mediterraneus* (Gistel, 1848), *Spinax (Acanthias)* (Girard, 1854), *Acanthias sucklii* (Girard, 1858), *Acanthias linnei* (Malm, 1877), *Acanthias lebruni* (Vaillant, 1888), *Acanthias commun* (Navarette, 1898), *Squalus mitsukurii* (Tanaka, 1917), *Squalus wakiyae* (Tanaka, 1918), *Squalus kirki* (Phillips, 1931), *Squalus whitleyi* (Phillips, 1931), *Squalus barbouri* (Howell-Rivero, 1936).

### DISTRIBUTION



The Spiny Dogfish has a wide distribution excluding the poles, tropics and Indian Ocean. In the east Atlantic it can be found from Iceland and Murmansk to West Sahara and the Canary Isles, including the Mediterranean and Black Seas. It is known from South Africa, the west Atlantic and the Pacific (Compagno, 1984; Bester, Unknown).

### COMMON NAMES

**Spiny Dogfish**, Spurdog, Piked Dogfish, Dogfish, Blue Dog, Darwen Salmon, Rock Salmon, Spring Dogfish, Victorian Spotted Dogfish, White-Spotted Dogfish, Aiguillat Commun (Fr), Mielga (Es).

### APPEARANCE

- Two dorsal fins with large, ungrooved spines.
- First dorsal fin originates behind free rear tips of the pectoral fins.
- No anal fin.
- No subterminal notch on caudal fin.
- Strong lateral keel on caudal fin.
- White spots are present on the grey flanks.

Female Spiny Dogfish grow to a maximum total length of 110–124cm in the North Atlantic, 130–160cm in the North Pacific, 200cm in the Mediterranean and 111cm around New Zealand. Males grow to a maximum 83–100cm in the North Atlantic, 100–107cm in the North Pacific and 90cm around New Zealand (Anon, 2006). Both dorsal fins have large, ungrooved spines and conspicuous free rear tips. The first originates behind the free rear tips of the pectoral fins, the second is smaller and originates above or slightly behind the free rear tips of the pelvic fins. There is no anal fin. The dorsal caudal lobe is large with no subterminal notch or lobe. The caudal keel is well developed (Compagno, 1984).

The dorsal surface is slate coloured to brown. There is a row of small white spots along each side from above the pectoral fins to above the pelvic fins. These spots are more conspicuous on immature fish, fading with age. The edges of the dorsal fins and caudal fin can appear dusky in very young individuals but quickly fade with age. The ventral surface can be pale grey to pure white (Bester, Unknown).

## SIMILAR SPECIES

*Galeorhinus galeus*, Tope

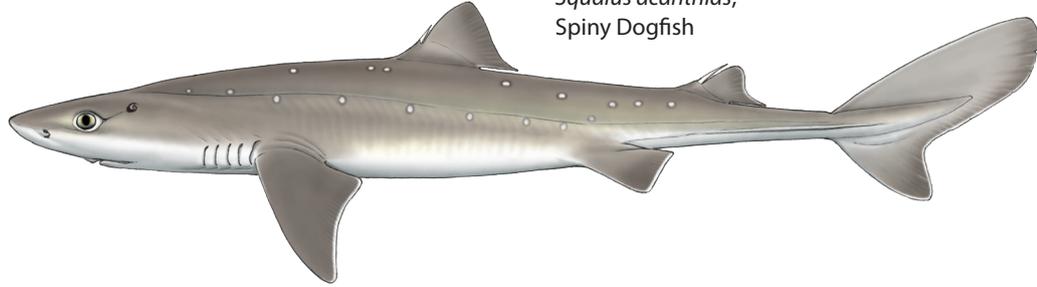
*Mustelus asterias*, Starry Smoothhound

*Mustelus mustelus*, Common Smoothhound

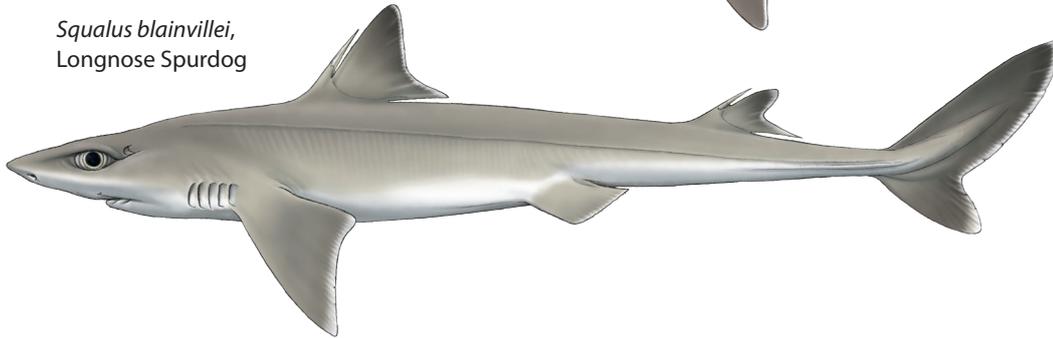
*Squalus blainvillei*, Longnose Spurdog

*Squalus megalops*, Shortnose Spurdog

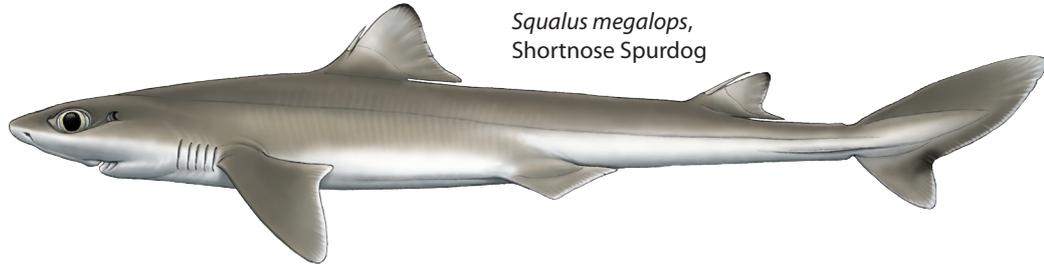
*Squalus acanthias*,  
Spiny Dogfish



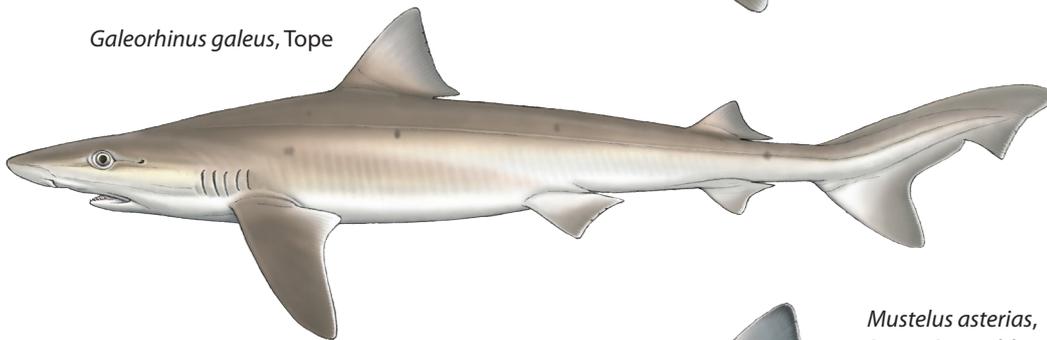
*Squalus blainvillei*,  
Longnose Spurdog



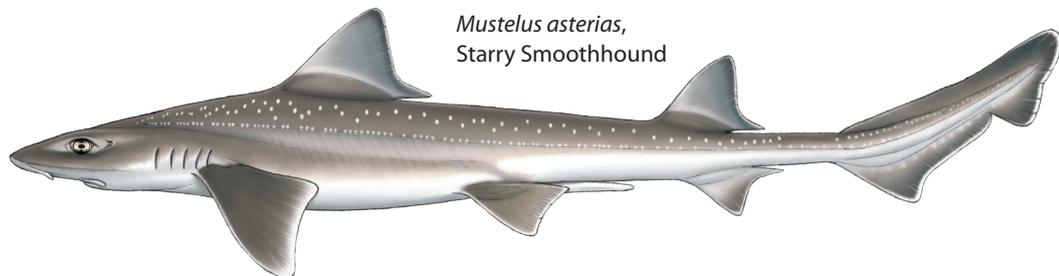
*Squalus megalops*,  
Shortnose Spurdog



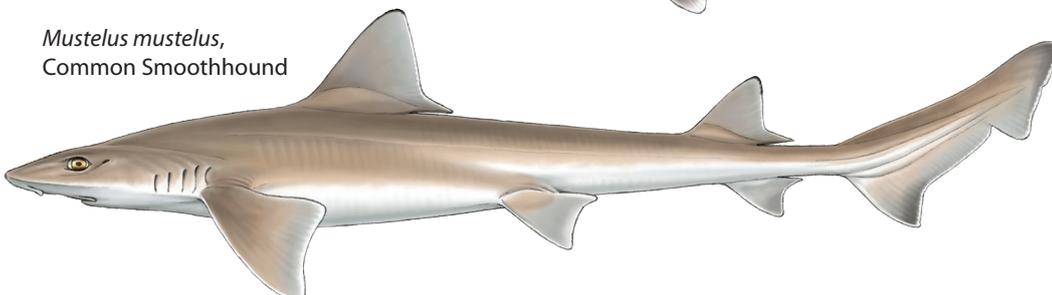
*Galeorhinus galeus*, Tope



*Mustelus asterias*,  
Starry Smoothhound



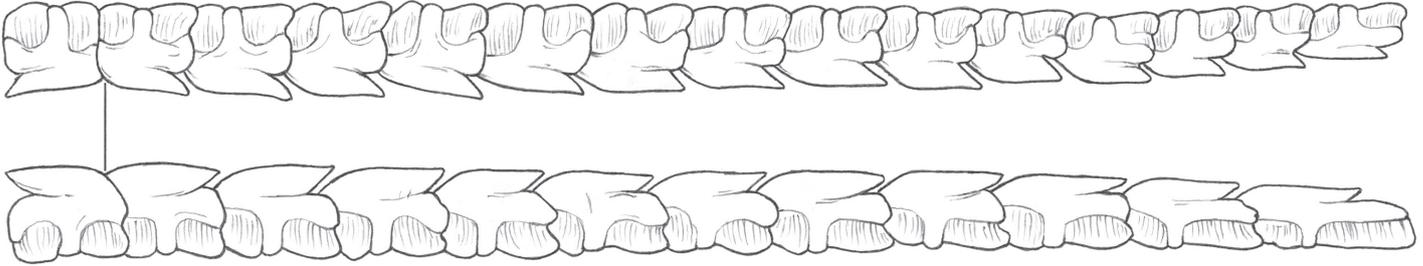
*Mustelus mustelus*,  
Common Smoothhound



(Not to scale)

## TEETH

There are oblique-cusped cutting teeth in both jaws, 28 in the upper jaw, 22–24 in the lower jaw (Compagno, 1984; Bester, Unknown).



## ECOLOGY AND BIOLOGY

### HABITAT

The Spiny Dogfish is a highly migratory species which is not known to associate with any particular habitat (Fordham *et al.*, 2006). It is predominantly epibenthic although it can be found throughout the water column from inshore waters to the continental shelf (Bester, Unknown). The maximum depth recorded is 900m (2,950ft) but it is most commonly found around 10–200m (33–655ft) (Compagno, 1984).

They segregate by size before reaching sexual maturity, with the younger, smaller sharks staying near the surface. The older the sharks become, the deeper they stay (Wood *et al.*, 1979). After sexual maturity the males and females also segregate, although they still segregate by size. The females remain in mid-water, moving to shallow water to give birth. The males stay further from the coast and closer to the bottom (Hjertnes, 1980; Nammack *et al.*, 1985).

It has been recorded through tagging studies that the species is highly migratory. In both the northeast and northwest Atlantic there are single populations which migrate seasonally (Aasen, 1964; Hjertnes, 1980; Gauld and MacDonald, 1982; Templeman, 1976). There have also been transatlantic migrations recorded although these are rare (Holden, 1967; Templeman, 1976). It appears to be temperature which drives these migrations as the Spiny Dogfish favours temperatures around 7–8°C (44.6–46.4°F) to 12–15°C (53.6–59°F). Salinity can also drive small scale migrations such as in the San Francisco Bay, the salinity of which drops after heavy precipitation becoming less tolerable for the Spiny Dogfish (Compagno, 1984).

### DIET

A 1996 study in the Irish Sea showed that the Spiny Dogfish feeds predominantly on teleost fish in that region, with crustaceans also forming a large part of the diet of smaller specimens (<60cm). For all sizes combined, the most important identifiable species were Atlantic Herring, *Clupea harengus* (11.87%), Whiting, *Merlangius merlangus* (8.15%), Norway Pout, *Trisopterus esmarkii* (6.17%), Poor Cod, *Trisopterus minutus* (5.36%) and Atlantic Mackerel, *Scomber scombrus* (5.36%). For animals less than 60cm in length, *Pagurus* spp. (9.70%) and *Calianassa* spp. (5.97%) were also important. In total, fish made up the majority of the diet (80.79%) followed by crustaceans (11.87%) and molluscs (2.79%) (Ellis *et al.*, 1996).

Conversely, a New Zealand study of the stomach contents of 7,283 Spiny Dogfish showed a preference for crustaceans (60%) with fish constituting a smaller part (15%) of the diet. Of these, Squat Lobster, *Munida gregurii* (30%), and the euphausiid *Nyctiphanes*

### DIET CONTINUED

*australis* (20%) were the most important. It is interesting to note that incidences of cannibalism were also reported to be high compared with North Atlantic studies (Hanchet, 1991). It has been reported that the species will scavenge on trawler discards, suggesting that it is an opportunistic feeder able to exploit a wide variety of prey (Kaiser and Spencer, 1994).

### REPRODUCTION

The life history and reproductive characteristics of the Spiny Dogfish are relatively well known, particularly in the North Atlantic, due to its abundance and interest to fisheries. The size and age at maturity vary between sub-populations. In the northwest Atlantic females mature at around 75cm total length at an age of 12 years, males around 60cm total length and at an age of 6 years. In the northeast Atlantic, females are reported to mature slightly larger and older at 83cm total length and 15 years (Anon, 2006).

In the Pacific Ocean, it matures later and at a larger size. Females in the northeast Pacific reach maturity at 23 years of age and at around 93.5cm total length. Males also mature later in the northeast Pacific at around 14 years of age (Anon, 2006).

Mating occurs offshore and development is ovoviviparous (Bester, Unknown). The gestation period has been recorded as being 18–22 months, one of the longest recorded for any vertebrate (Anon, 2006). This does not appear to change between the Atlantic and Pacific Oceans. However, it has been reported that development in the Black Sea takes only 12 months (Kirnosova, 1989). During the last 17–19 months of development, the embryo receives no nourishment from the mother and is instead nourished by its yolk sac (Bester, Unknown).

Off the east coast of New Zealand's South Island it has been reported that during the first year of pregnancy, females move inshore to shallow water (~50m). During the second year however, the majority move back to deeper water (200–300m) where they give birth and then mate again (Hanchet, 1998). It has also been reported that the species gives birth in offshore, deepwater wintering grounds in the North Atlantic (Castro, 1983). However off Newfoundland, it has been reported that females move inshore to give birth from January to May (Templeman, 1944). This has also been recorded through July and August from the San Juan Islands of Washington (Camhi, 1999).

In both hemispheres, females give birth to a litter of 1–20 young varying from 18–30cm total length. The average size at birth in the northeast Atlantic (from Swedish waters) has been reported as 26–27cm total length, although these figures depend on the size of the mother (Stenberg, 2005; Compagno, 1984). There is believed to be no resting stage with females giving birth every 2 years (Anon, 2006).

## COMMERCIAL IMPORTANCE

A valuable species, the Spiny Dogfish is taken across much of its range in targeted fisheries and as bycatch in mixed species fisheries. The majority are taken by bottom trawls, gillnets, longlines and by rod and reel (Fordham *et al.*, 2006). The biggest demand is in western Europe with the majority landed from the northeast Atlantic or imported from North America and Scandinavia (European Commission, 2006).

## IUCN RED LIST ASSESSMENT

Vulnerable (2006).  
Critically Endangered in northeast Atlantic.

## THREATS, CONSERVATION, LEGISLATION

The Spiny Dogfish is a highly migratory species which is protected in only a limited part of its range. Naturally abundant, its late maturity, low reproductive capacity, longevity, long generation time and very low rate of population increase makes it extremely vulnerable to overfishing. Once considered the most abundant and widespread elasmobranch species, populations have fallen across its range, particularly in the northeast Atlantic where declines of 95% have been recorded due to intense fishing pressure (Fordham *et al.*, 2006).

Despite these significant declines, very few management measures are in place for the Spiny Dogfish. In the EU, a Total Allowable Catch (TAC) has been in place since 1999 although it only became restrictive in 2005. The table below shows the TAC in ICES areas IIa and IV compared to landings from 1999 to 2007. In 2007, ICES areas I, IIIa, IV–VIII, XII and XIV were brought under a TAC and assigned 2,820t. In 2008 area IIIa was removed from this list and the TAC was reduced to 2,004t.

ICES Division	1999	2000	2001	2002	2003	2004	2005	2006	2007
TAC in IIa & IV	8,870	8,870	9,070	7,100	5,640	4,472	1,136	961	791
Landings in IIa & IV	3,006	2,847	2,259	1,963	2,148	2,044	1,406	978	714

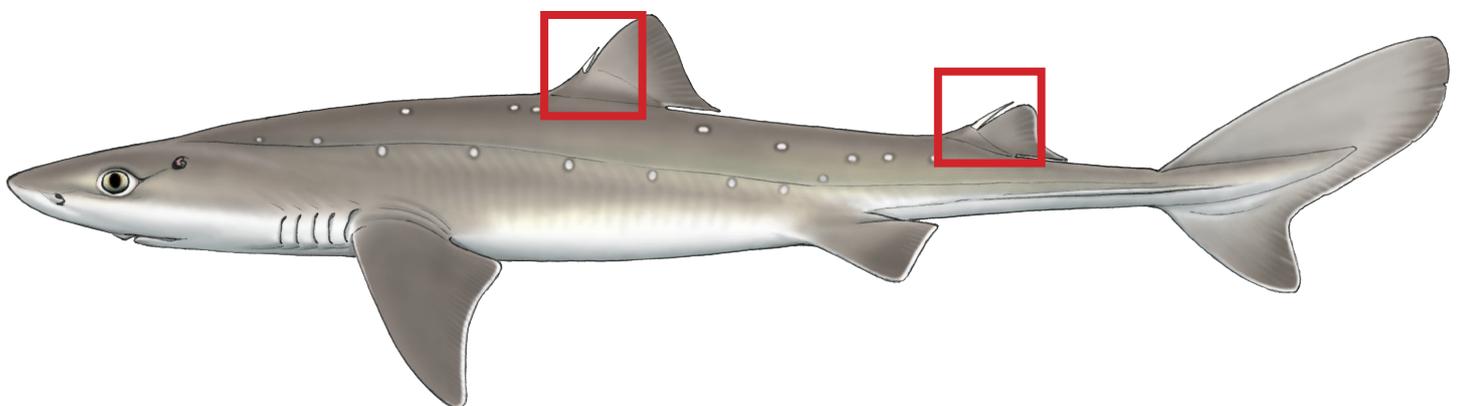
(All figures in tons.)

In 2009 the total TAC was reduced by 50% to 1,422t. Areas IIa and IV were assigned 316t, area IIIa was assigned 104t and areas I, V–VIII, XII and XIV were assigned 1,002t. A maximum landing size of 100cm was implemented for all of these areas to protect the largest, most fecund females. In 2010, this TAC was reduced by a further 90% with the remaining 10% only allowed to be taken as bycatch. In the UK, this has translated as two fish per trip per boat, with the 100cm maximum landing size still in place.

It has long been understood that the fishery must be closed if stocks are to recover and ICES have recommended that the TAC be set at zero since 2006 (Fordham *et al.*, 2006). As yet this has not been done, although it is believed that the European Commission will set the TAC for 2010 at 0. It remains to be seen if populations can recover to their previous levels.

## HANDLING

- Handle with care.
- Large, venomous dorsal spines.
- Powerful jaws and sharp teeth.
- Abrasive skin.



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Text: Richard Hurst.

Illustrations: Marc Dando.

### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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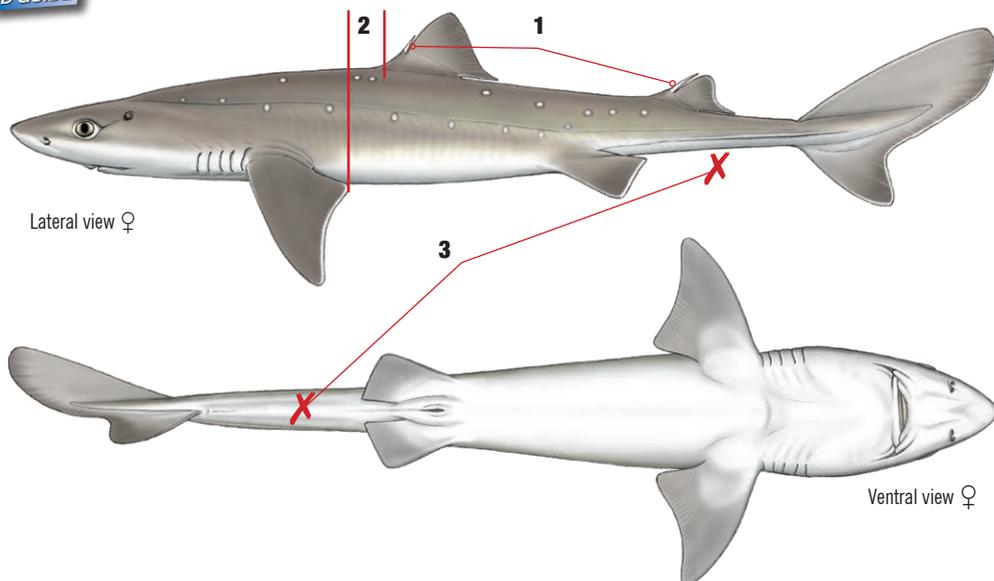
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**Email:** [enquiries@sharktrust.org](mailto:enquiries@sharktrust.org)

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Lateral view ♀

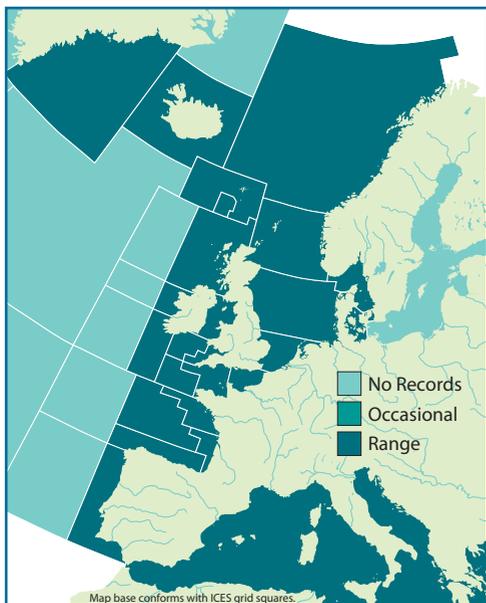
Ventral view ♀

## SCIENTIFIC NAME

*Squalus acanthias* (Smith & Radcliffe, 1912).

## DISTRIBUTION

Circumglobal in temperate waters. East Atlantic from Murmansk and Iceland south to west Sahara, including the Mediterranean and Black Seas. Cape Coast of South Africa<sup>iii</sup>.



## COMMON NAME

**SPINY DOGFISH**, Spurdog, Piked Dogfish, Dogfish, Rock Salmon, Spring Dogfish, White-Spotted Dogfish, Aiguillat Commun [Fr], Cazón Espinoso Común [Es].

## IDENTIFICATION

- 1 Large dorsal spines.
- 2 First dorsal fin originates behind pectoral free rear tips.
- 3 No anal fin<sup>iii</sup>.

## COLOUR

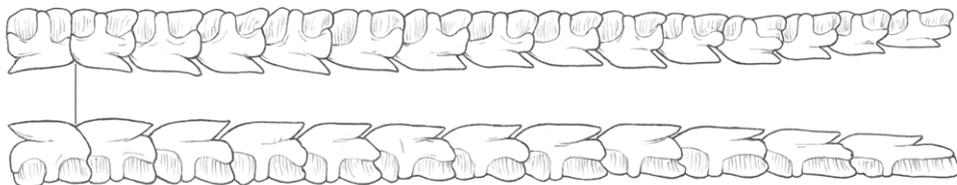
- Rows of white spots on flanks.
- Slate grey to brown dorsally.
- Pale grey to white ventrally<sup>ii</sup>.

## BIOLOGY AND SIZE

- Birth: 18–30cm. Maturity: 83cm ♀ 60cm ♂. Max TL: 124cm ♀ 100cm ♂. Highly variable regionally<sup>i</sup>.
- Feed predominantly on bony fish in the Northeast Atlantic. Crustaceans and molluscs are also important, particularly when young<sup>iv</sup>.
- Litters of 2–21 pups born after 18–22 month gestation period, one of the longest recorded for any vertebrate<sup>i</sup>.



## TEETH

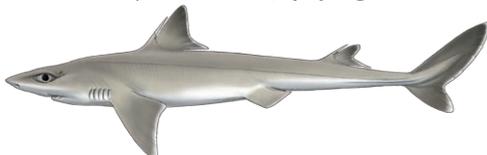


- Oblique-cusped cutting teeth in both jaws<sup>iii</sup>.
- 28 upper teeth, 22–24 lower teeth<sup>ii</sup>.

## SIMILAR SPECIES



- Squalus acanthias*, **Spiny Dogfish**



- Squalus blainvillei*, **Longnose Spurdog**



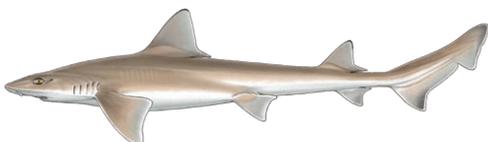
- Squalus megalops*, **Shortnose Spurdog**



- Galeorhinus galeus*, **Tope**



- Mustelus asterias*, **Starry Smoothhound**



- Mustelus mustelus*, **Common Smoothhound**

## HABITAT

- From surface to 900m, most common 10–200m<sup>iii</sup>.
- Highly migratory, follows seasonal temperature gradients.
- Transatlantic migrations have occasionally been recorded.
- Segregate by size, and by sex when mature<sup>vii</sup>.

## CONSERVATION STATUS

- Historically the most abundant elasmobranch in the North Atlantic, but populations have fallen by 95% in some places due to overfishing<sup>vi</sup>.
- Red List status:** Vulnerable (2006)  
Critically Endangered in northeast Atlantic.

## COMMERCIAL IMPORTANCE

- Previously a highly important species targeted across its range by bottom trawls, gillnets and longlines<sup>vi</sup>.
- Biggest demand is in Western Europe, particularly the UK, France and Germany<sup>vi</sup>.
- 2010 – Subject to a TAC of zero with a 10% bycatch allowance and a **maximum** landing size (100cm) in EU waters.

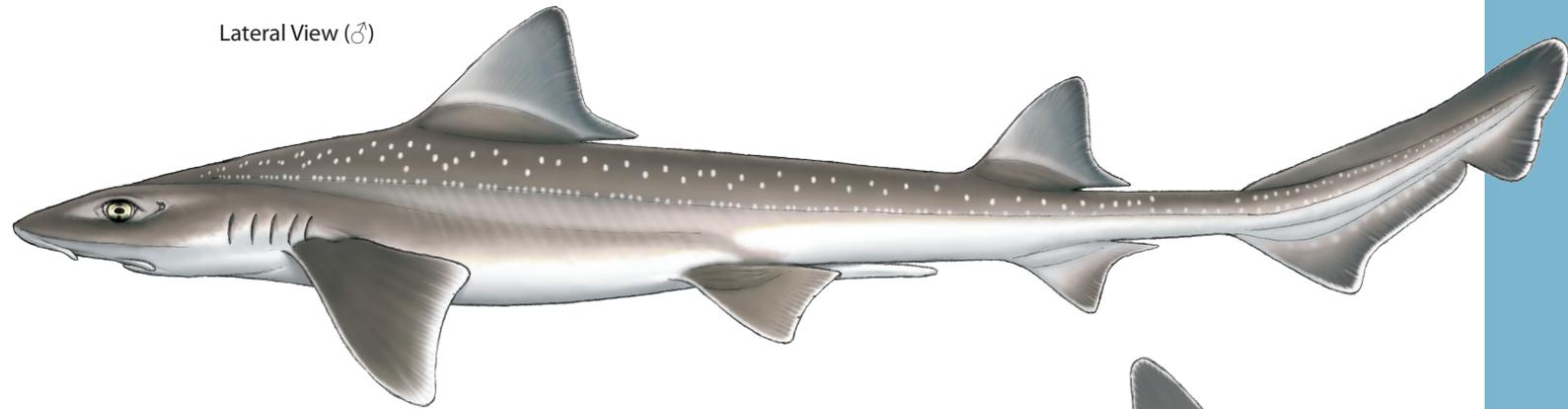
## HANDLING

- Handle with care.
- Large, venomous dorsal spines.
- Powerful jaws and sharp teeth.
- Abrasive skin.

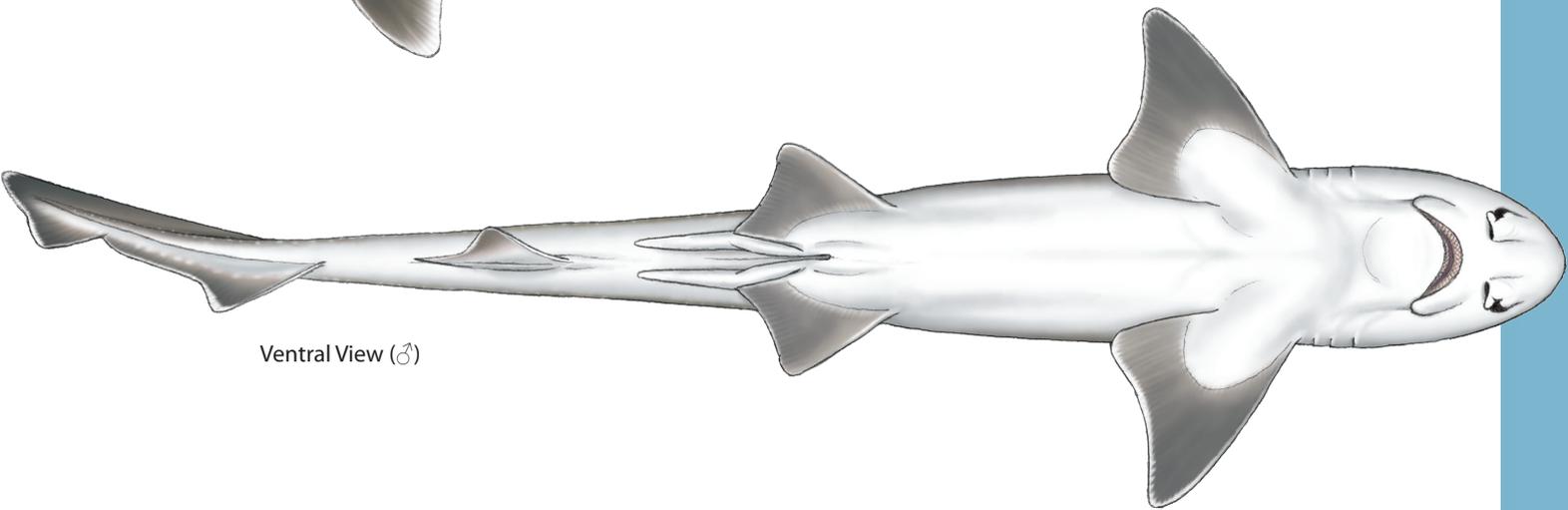
## REFERENCES

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Lateral View (♂)



Ventral View (♂)



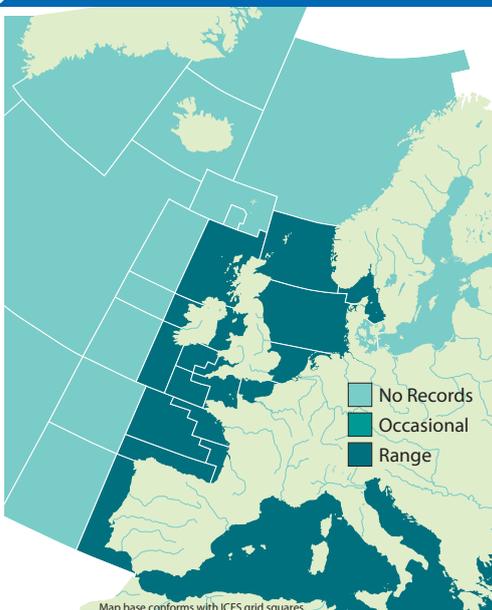
### COMMON NAMES

**Starry Smoothhound**, Stellate Smoothhound, Aristotle's Shark, Emissole Tachetée (Fr), Musola Estrellada (Es).

### SYNONYMS

*Squalus hinnulus* (Blainville, 1825), *Mustelus stellatus* (Risso, 1826), *Mustelus plebeius* (Bonaparte, 1834), *Mustelus equestris* (Bonaparte, 1834), *Squalus albomaculatus* (Plucar, 1846), *Squalus edentulus* (Doderlein, 1881).

### DISTRIBUTION



The Starry Smoothhound is known in the northeast Atlantic from the British Isles and North Sea to Mauritania and the Canary Isles, including the Mediterranean Sea (Compagno, 1984). Confusion with the Common Smoothhound, *Mustelus mustelus*, may mean records are incomplete.

### APPEARANCE

- Large, generally white spotted smoothhound.
- Both dorsal fins prominent, the first larger than the second.
- First dorsal fin originates over pectoral bases.
- No dorsal spines.
- Large pectoral fins.
- Anal fin present.
- Large dorsal caudal lobe with large subterminal notch and lobe.
- Grey or grey-brown dorsally.
- Sometimes with rows of white spots on flanks.
- Ventrally light.

The Starry Smoothhound is a slender species with two large, prominent dorsal fins, the first larger than the second. The first dorsal fin originates over the base of the pectoral fins, the second just forward of the anal fin. There are no dorsal spines and the free rear tips are small. The dorsal caudal lobe is large with a strong terminal notch and lobe (Compagno, 1984).

It can be an easily identifiable species as it is the only member of the *Mustelus* genus with white spots in European waters. However, these spots can be faded or completely absent, meaning that any *Mustelus* spp. with no white spots cannot automatically be attributed to the Common Smoothhound, *Mustelus mustelus* (Farrell *et al.*, 2009). Positive identification can be made physically in three ways. Firstly, the buccopharyngeal denticles cover the entire palate and floor of the mouth in the Starry Smoothhound but only the tongue tip and extreme anterior end of palate in the Common Smoothhound. Secondly, the longitudinal ridges of the dermal denticles extend only half way along their length in the Starry Smoothhound whereas in the

## SIMILAR SPECIES

Common Smoothhound they extend along their entire length (Compagno, 1984). Lastly, the connection between the female and the embryo is different between the species.

None of these methods are particularly useful for live specimens or large numbers of sharks. The last in particular only works for pregnant females landed whole. Genetic identification methods are therefore becoming more widespread (Farrell *et al.*, 2009). Amongst similar species from different genus, it can be distinguished from the Tope Shark, *Galeorhinus galeus*, by the large second dorsal fin and from the Spiny Dogfish, *Squalus acanthias*, by the presence of an anal fin and absence of dorsal spines (Compagno, 1984).

On the back and flanks it is grey to grey-brown commonly, but not always, with white spots. There are no dark spots or bands. Ventrally it is lighter to white (Farrell *et al.*, 2009).

## SIMILAR SPECIES

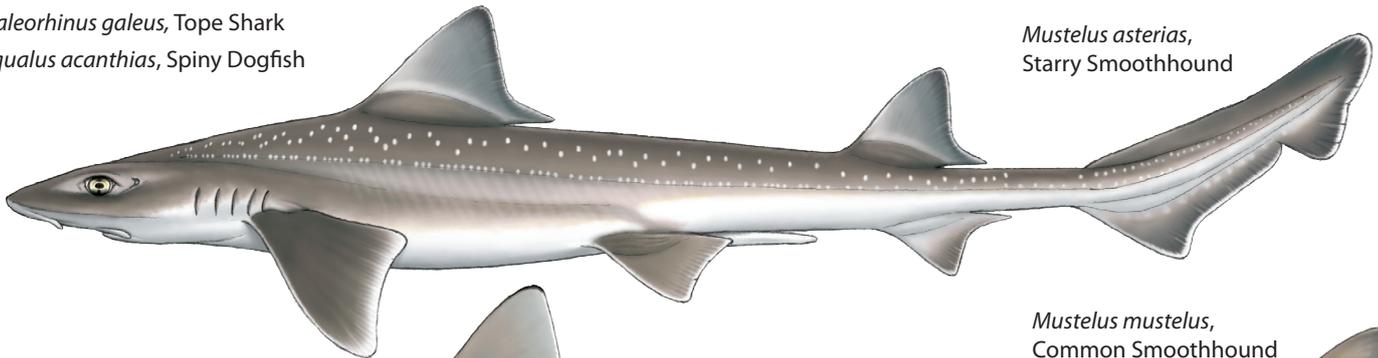
*Mustelus mustelus*, Common Smoothhound

*Mustelus punctulatus*, Blackspotted Smoothhound

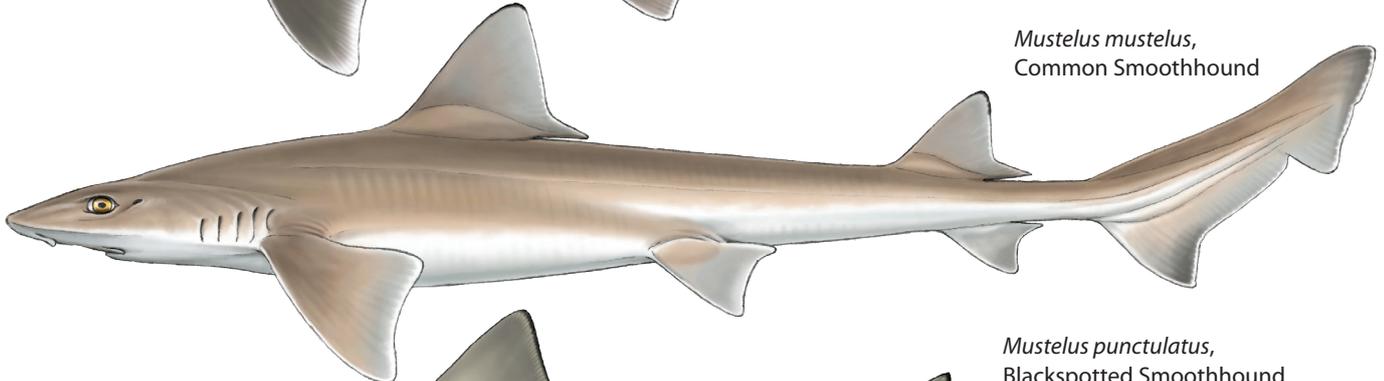
*Galeorhinus galeus*, Tope Shark

*Squalus acanthias*, Spiny Dogfish

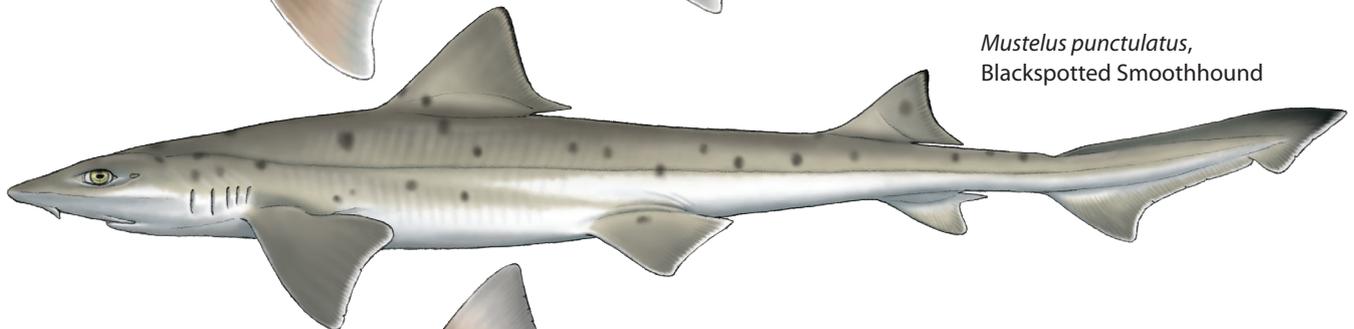
*Mustelus asterias*,  
Starry Smoothhound



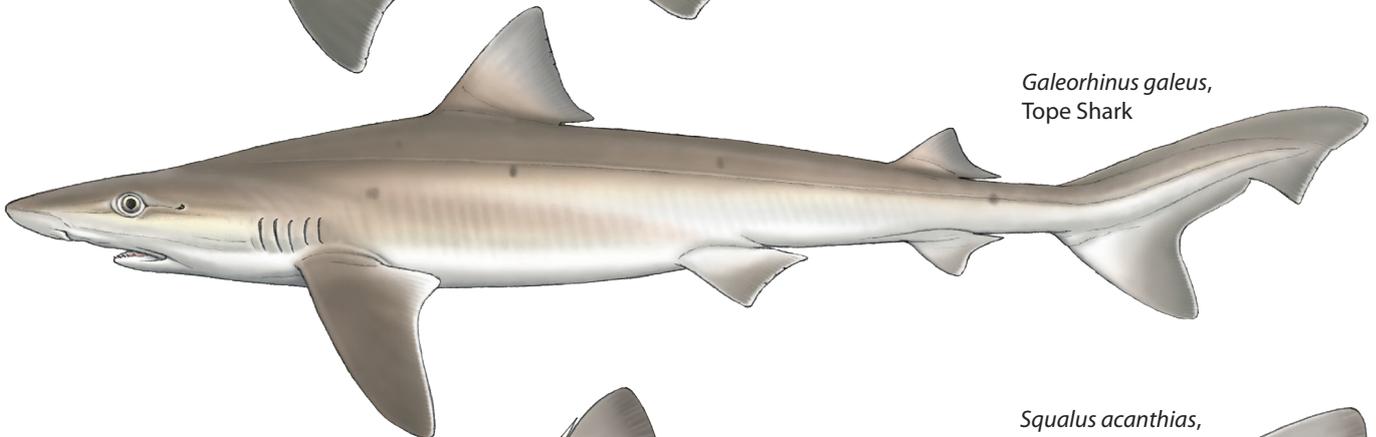
*Mustelus mustelus*,  
Common Smoothhound



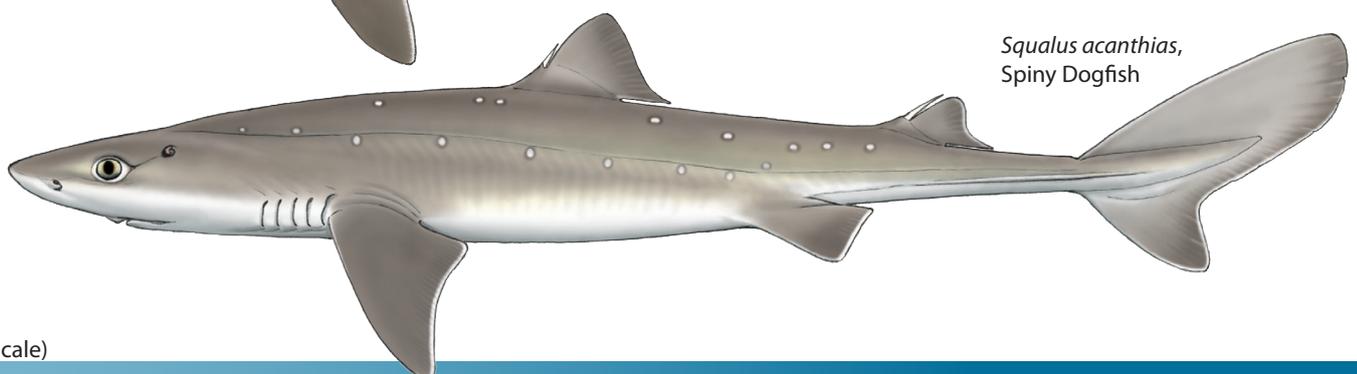
*Mustelus punctulatus*,  
Blackspotted Smoothhound



*Galeorhinus galeus*,  
Tope Shark



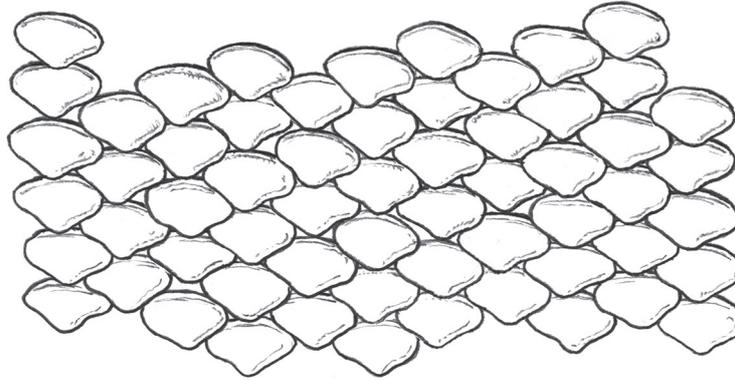
*Squalus acanthias*,  
Spiny Dogfish



(Not to scale)

### TEETH

The teeth are asymmetric with the cusps reduced to a low point. Very young individuals may also have cusplets (Compagno, 1984). The entire oral cavity is covered in buccopharyngeal denticles (Farrell *et al.*, 2009).



### ECOLOGY AND BIOLOGY

#### HABITAT

An inshore species of the continental and insular shelves, the Starry Smoothhound is most commonly found on or near the bottom from the intertidal zone to at least 100m. It seems to have a preference for sand and gravel bottoms (Compagno, 1984).

#### EGGCASE

N/A

#### DIET

A 1996 study in the Irish Sea showed crustaceans make up 97.4% of the diet of the Starry Smoothhound. Of these, *Liocarcinus* spp. (56.1%) are the most important prey items followed by *Pagurus* spp. (7.1%). Fish made up only 1.86% of the stomach contents examined and Holothuroidea (0.7%) were the only molluscs recorded (Ellis *et al.*, 1996). It has been noted that hermit crabs are eaten complete with the shell and any associated anemones (Compagno, 1984).

#### REPRODUCTION

Unlike the Common Smoothhound, *Mustelus mustelus*, the Starry Smoothhound is an aplacental viviparous, or ovoviviparous, species (Farrell *et al.*, 2009). It has been recorded from Tunisia that females and males mature at 96cm and 75cm total length respectively. Mating and birth both occur during the summer after a gestation period of 12 months. Litters are small (10–35 fetuses) and the number of young is proportional to the size of the mother (Capape, 1983). At birth, the pups measure around 30cm in length (Compagno, 1984).

## COMMERCIAL IMPORTANCE

The Starry Smoothhound is mainly a bycatch species in the northeast Atlantic taken by bottom trawls, longlines and gillnets (Compagno, 1984). It has little or no commercial importance in northern Europe but is targeted throughout the Mediterranean and is one of the most valuable shark species there (Anon, 1997). It is popular with recreational anglers (Anon, 2007).

## THREATS, CONSERVATION, LEGISLATION

The Starry Smoothhound is a widespread although not abundant species. It is taken as bycatch in trawl and gillnet fisheries but there does not appear to be any immediate threat from overexploitation in the Atlantic (Ellis, 2000). In the Mediterranean it is targeted for its flesh so is under more intensive fishing pressure. Widespread population trends are poorly understood but it has been extirpated from the Gulf of Lions, northwest Mediterranean (Aldebert, 1997). It is not considered to be in any immediate threat of over exploitation (Ellis, 2000).

## IUCN RED LIST ASSESSMENT

Least Concern (2000).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth and powerful jaws.
- Abrasive skin.

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Text: Richard Hurst.  
Illustrations: Marc Dando.

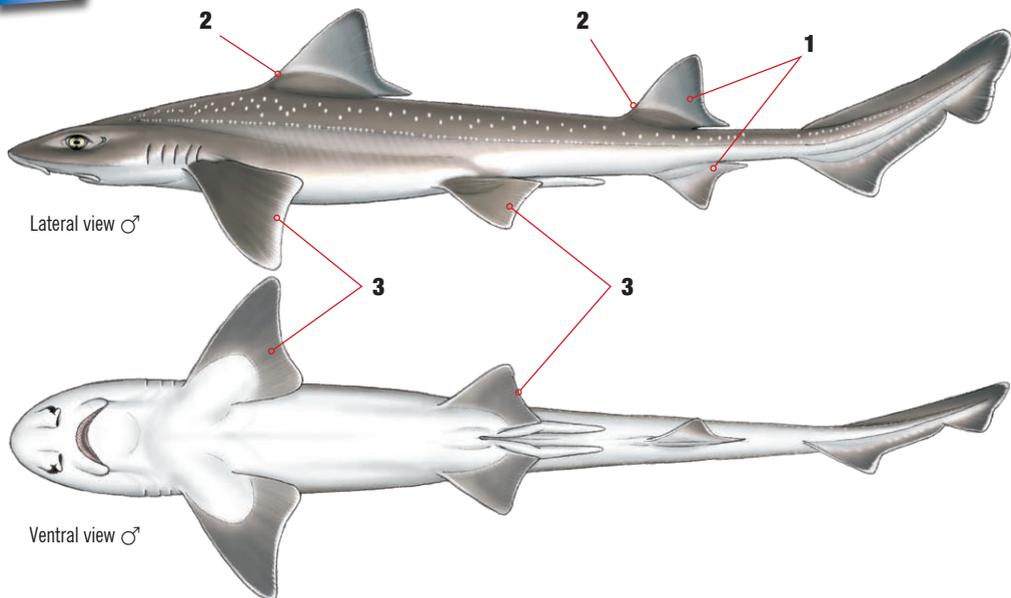
#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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Lateral view ♂

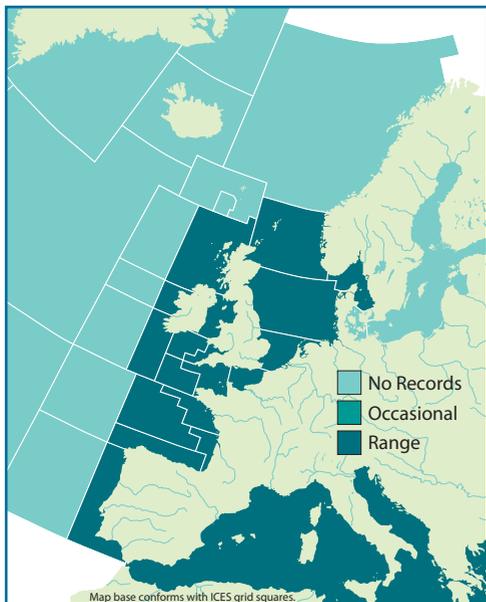
Ventral view ♂

### SCIENTIFIC NAME

*Mustelus asterias* (Cloquet, 1821).

### DISTRIBUTION

Northeast Atlantic from the British Isles and North Sea to Mauritania and the Canary Isles, including the Mediterranean Sea<sup>iv</sup>.



### COMMON NAME

**STARRY SMOOTHHOUND**, Stellate Smoothhound, Aristotle's Shark, Emissole Tachetée (Fr), Musola Estrellada (Es).

### IDENTIFICATION

- 1 Second dorsal fin much larger than anal fin.
- 2 No dorsal spines.
- 3 Large pectoral and pelvic fins<sup>iv</sup>.

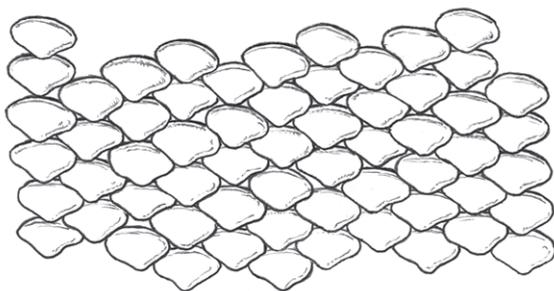
### COLOUR

- Grey or grey-brown dorsally.
- Rows of white spots may be present on flanks<sup>vii</sup>.
- Lighter to white ventrally<sup>iv</sup>.

### BIOLOGY AND SIZE

- Born: 30cm. Mature: 85cm ♀, 78–85cm ♂. Max TL: 140cm<sup>iv</sup>.
- Ovoviviparous, gestation periods of 12 months have been recorded with litters of 10–35 pups<sup>iii</sup>.
- Crustaceans make up the vast majority of the diet, 97.4% in Irish Sea specimens<sup>v</sup>.

## TEETH

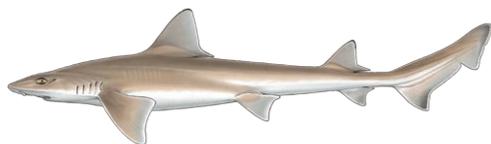


- Asymmetric with cusps reduced to a low point.
- Very young may have cusplets<sup>v</sup>.
- Denticles cover entire oral cavity<sup>vii</sup>.

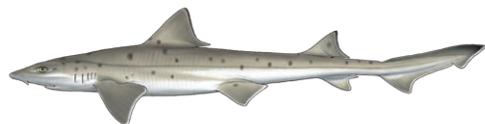
## SIMILAR SPECIES



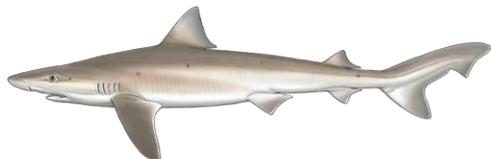
- Mustelus asterias*, **Starry Smoothhound**



- Mustelus mustelus*, **Common Smoothhound**



- Mustelus punctulatus*, **Blackspotted Smoothhound**



- Galeorhinus galeus*, **Tope**



- Squalus acanthias*, **Spiny Dogfish**

## HABITAT

- From shallows to more than 100m.
- Hunt for crustacean prey along the bottom, rarely moving into water column.
- Seem to prefer soft sediments (sand and gravel)<sup>iv</sup>.

## CONSERVATION STATUS

- Increasingly targeted as more valuable species disappear. May come under increasing pressure in the future<sup>vi</sup>.
- Red List status:** Least Concern (2000).

## COMMERCIAL IMPORTANCE

- Targeted in the Mediterranean where its flesh is very valuable<sup>i</sup>.
- Bycatch species in Atlantic bottom trawls, gillnets and line gear<sup>iv</sup>.
- Popular with recreational anglers and can be caught from the shore<sup>ii</sup>.

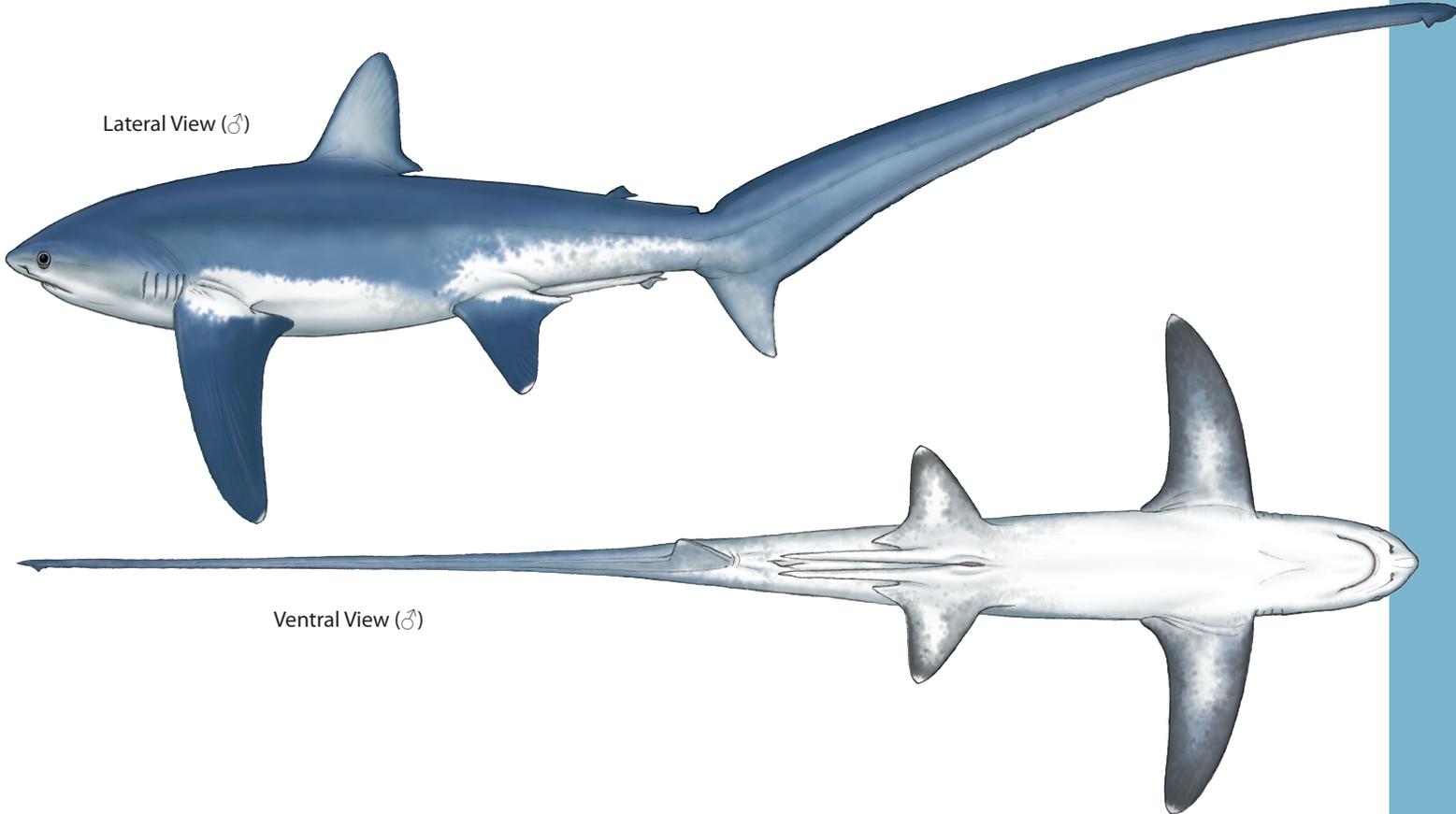
## HANDLING

- Handle with care.
- Crushing teeth and powerful jaws.
- Abrasive skin.

## REFERENCES

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- Ellis, J. R; 2000. IUCN Red List.
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Lateral View (♂)



Ventral View (♂)

### COMMON NAMES

**Thresher Shark**, Thrasher Shark, Common Thresher Shark, Fox Shark, Grayfish, Sea Fox, Slasher, Swingletail, Swiveltail, Thintail Thresher, Whip-Tailed Shark, Zorro Thresher Shark, Renard (Fr), Faux (Fr), Zorro (Es), Chichi Espada (Es).

### SYNONYMS

*Squalus vulpes* (Gmelin, 1789), *Alopias macrourus* (Rafinesque, 1810), *Galeus vulpecula* (Rafinesque, 1810), *Squalus alopecias* (Gronow, 1854), *Alopecias barrae* (Perez Canto, 1886), *Alopecias chilensis* (Philippi, 1901), *Alopecias longimana* (Philippi, 1901), *Vulpecula marina* (Garman, 1913), *Alopias caudatus* (Phillipps, 1932), *Alopias greyi* (Whitley, 1937).

### DISTRIBUTION



The Thresher Shark is found almost worldwide in tropical to cold temperate seas. In the east Atlantic it is known from Norway and the British Isles to Cape Province, South Africa, including the Mediterranean Sea. It is also found throughout the west Atlantic, Pacific and Indian Oceans (Compagno, 2001).

### APPEARANCE

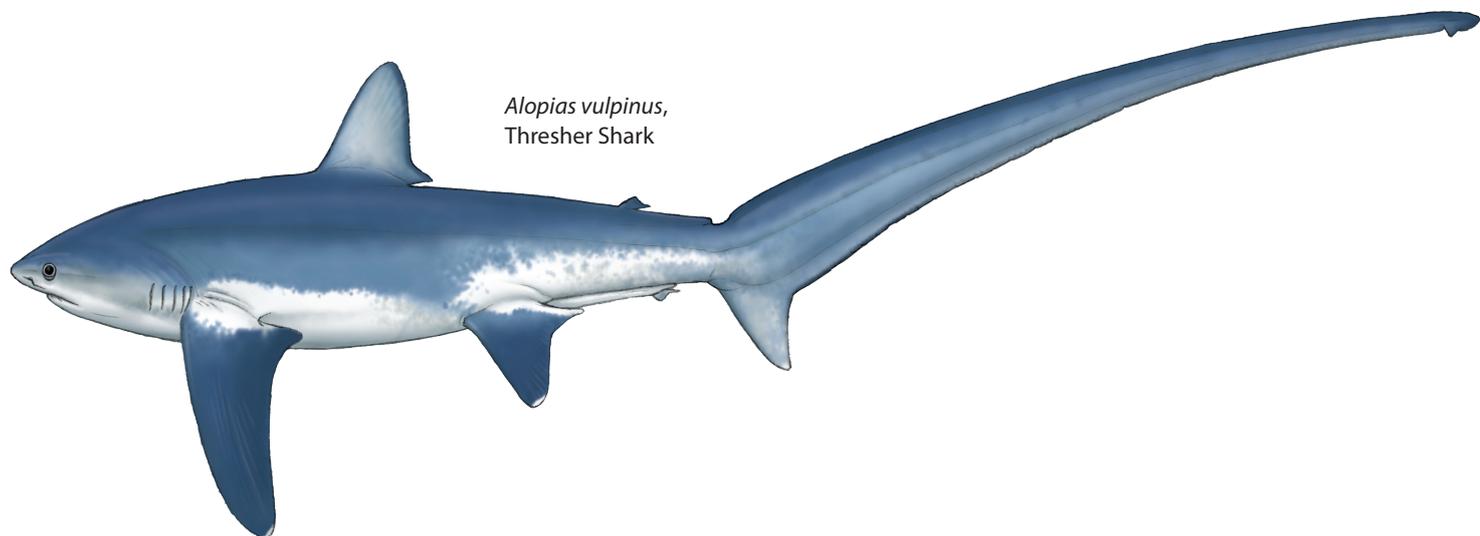
- Long dorsal caudal lobe, about as long as rest of shark.
- Large pectoral and first dorsal fins.
- Tiny second dorsal and anal fins.
- Over 29 rows of small teeth in each jaw.
- Dorsally grey, brown, blue or blackish.
- Pectoral, pelvic and dorsal fins blackish.
- Sometimes white dots on pectoral, pelvic, and caudal fin tips.
- Ventrally white, extending over the pectoral fin bases.

The Thresher Shark is named for and easily recognisable by its extremely long tail, the upper lobe of which can be as long as the rest of the shark. The first dorsal fin and pectoral fins are large. The second dorsal fin and anal fins are tiny. The snout is sharply pointed with a small mouth containing 29 rows of small teeth in each jaw. The mouth has labial furrows (Compagno, 2001).

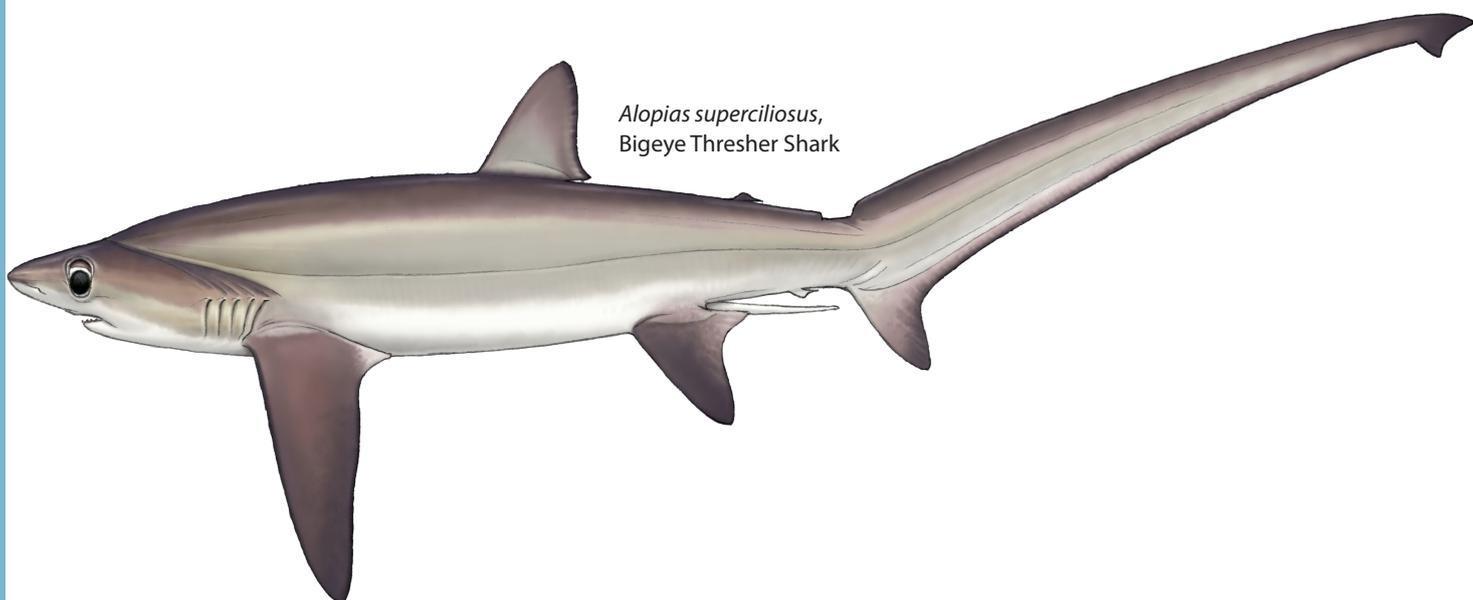
The Thresher Shark has irregular white markings on its underside whilst the rest of the body can be brown to blue-grey with metallic hues on the flanks. The ventral white colouring extends above the pectoral fins leaving a conspicuous 'bald patch.' There can be white markings on the pectoral, dorsal and caudal fins (Compagno, 2001).

## SIMILAR SPECIES

*Alopias superciliosus*, Bigeye Thresher Shark



*Alopias vulpinus*,  
Thresher Shark

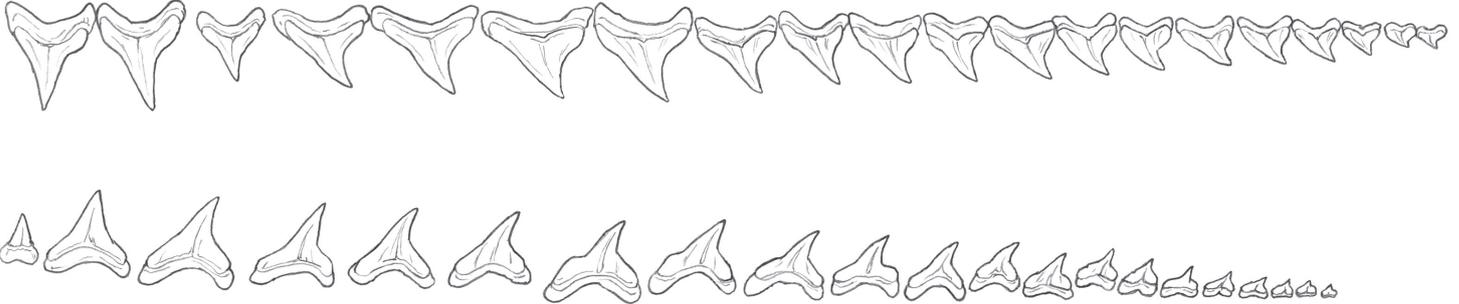


*Alopias superciliosus*,  
Bigeye Thresher Shark

(Not to scale)

### TEETH

Small, blade-like, smooth edge-curved teeth. 40 (20–20) in the upper jaw, 42 (21–21) in the lower jaw (Jordan, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

In the open ocean the Thresher Shark is commonly found from the surface down to depths of at least 336m (1,100ft) (Compagno, 2001). Some sources claim maximum depths of 550m (1,800ft) but these reports are difficult to verify (Carpenter, 2009). The species is most abundant 40–75 miles from land in temperate regions as it gives birth inshore and the pups stay in shallow, coastal waters, only venturing further into the open ocean when closer to maturity (Smith *et al.*, 2008). It has been noted that the Thresher Shark segregates by size and sex. In the Gulf of Cadiz and waters off northeast Morocco, near-term female dominated schools move shoreward in spring, presumably to give birth. Towards the end of spring neonates and gravid females dominate with no adult males found (Smith *et al.*, 2008).

Like other Lamnid sharks, the Thresher Shark has a 'rete mirabile' systems that allows it to maintain its body temperature above that of the surrounding water (Martin, 1992). This is a rare trait among fishes, only the mackerel sharks (Lamnidae), tunas (Thunnini) and billfishes (Xiphiidae, Istiophoridae) having evolved this ability (Weng and Block, 2004). This adaptation allows the shark to range much further into the temperate regions than similar cold-blooded species and explains its relative abundance along the temperate Atlantic coasts of Europe and the U.S.A. (Martin, 1992).

#### DIET

The Thresher Shark has developed an unusual method of hunting. Working either alone or in small groups, it bunches up small to medium sized schooling fish then stuns and disorients them using its tail. The shark then takes the dazed fish. Similar behaviour has been recorded in whales, dolphins and some other fish, however none of these are so highly adapted to this method of feeding (Jordan, Unknown). Apart from schooling fish such as mackerels, bluefishes and needlefishes, the Thresher Shark is known to feed on squid, octopi, crustaceans, and has been recorded using its tail to kill seabirds (Goldman *et al.*, 2002).

#### REPRODUCTION

A 2008 study of the species in California and Oregon waters concluded that males and females mature at approximately the same length (303cm TL ♀, 293-311cm TL ♂) and age (5.3 years ♀, 4.8 years ♂). Reproduction appears to be annual, with mating in the northeast Atlantic taking place in midsummer (Smith *et al.*, 2008).

The Thresher Sharks is ovoviviparous, meaning that the young develop within the mothers body in a primitive uterus (Smith *et al.*, 2008). They are nourished by yolk-filled egg capsules that are continually produced by the mother for the unborn young to consume. This is known as oophagy or oviphagy and is a form of intrauterine (within-the-womb) cannibalism (Martin, 1994). The gestation period appears to be 9 months and it has been suggested that, as the rete mirabile system warms the uteri, development is hastened in the Alopiidae and Lamnidae sharks (Smith *et al.*, 2008; Martin, 1992). Average litter size is between 2 and 4 pups although the maximum recorded is 7. These pups are born already measuring 114-160cm (3.7-5.2ft) (Smith *et al.*, 2008).

## COMMERCIAL IMPORTANCE

The Thresher Shark is regularly landed by longline and trawl fisheries, particularly in the Mediterranean Sea and northeast Atlantic Ocean. It is also highly sought by Russia and Japan in the northwest Indian Ocean and central Pacific Ocean. It is a popular game fish due to its hard fighting nature and habit of breaching when hooked. Its meat is used for human consumption and its liver oil is processed for vitamins. Its fins are also highly prized for sharkfin soup and its skin can be used as leather (Compagno, 2001).

## THREATS, CONSERVATION, LEGISLATION

The Thresher Shark is an important economic species in many areas and is taken in large numbers, including the Mediterranean Sea and northeast Atlantic. Regularly landed as bycatch in long-line and trawl fisheries, its meat is highly prized fresh but can also be salted/dried and the fins are used for sharkfin soup in much of Asia. The oil from its liver can be processed for vitamins and its hide is usable for leather. The Thresher Shark is also sought by recreational anglers for its fighting ability and food value (Goldman *et al.*, 2002).

The Thresher Shark reproduces more regularly than Bigeye and Pelagic Thresher Sharks but has still proved highly vulnerable to intensive fishing efforts. In 1977-1978, a drift-net fishery was established to target the Thresher Shark off the west coast of the USA. After less than a decade the population was showing signs of serious decline. Since the fishing pressure was greatly reduced in the mid 1980's a certain amount of stock re-growth has been observed but the population is estimated to still be at half of pre-fishing levels. This has led to concern about populations in less well managed fisheries around the globe (Smith *et al.*, 2008).

In the northeast Atlantic, The Thresher Shark is covered by EC Regulation No. 1185/2003 which prevents the removal of shark fins at sea and the subsequent discard of the body. This applies to all vessels operating in EC waters, as well as to EC vessels operating anywhere (CPOA Sharks, 2009). However some countries issue Special Fishing Permits which allow finning to take place.

## IUCN RED LIST ASSESSMENT

Vulnerable (2008).

Near Threatened in northeast Atlantic.

## HANDLING

- Handle with care.
- Long tail extremely dangerous when hooked.
- Sharp teeth and abrasive skin.

### REFERENCES

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Text: Richard Hurst.  
Illustrations: Marc Dando.

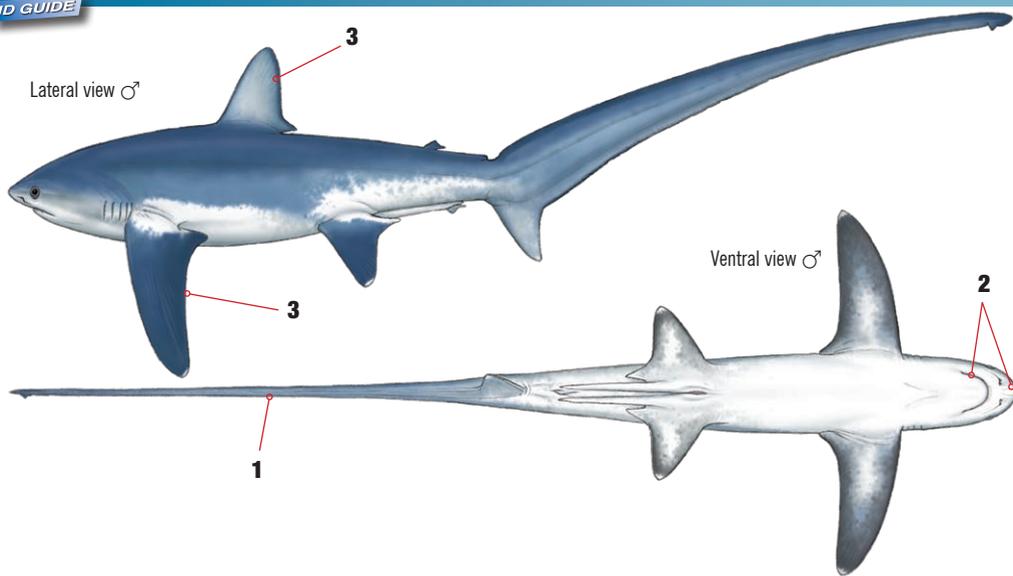
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Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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## SCIENTIFIC NAME

*Alopias vulpinus* (Bonnaterre, 1788).

## DISTRIBUTION

Almost circumglobal in tropical and cold temperate seas. East Atlantic from Norway to Cape Province, South Africa, including the Mediterranean Sea<sup>ii</sup>.



## COMMON NAME

**THRESHER SHARK**, Common Thresher, Thintail Thresher, Fox Shark, Sea Fox, Swiveltail, Thrasher, Renard (Fr), Faux (Fr), Zorro (Es), Chichi Espada (Es).

## IDENTIFICATION

- 1 Dorsal caudal lobe greatly elongated, as long as rest of body.
- 2 Pointed snout with small, arched mouth.
- 3 Large first dorsal and pectoral fins<sup>ii</sup>.

## COLOUR

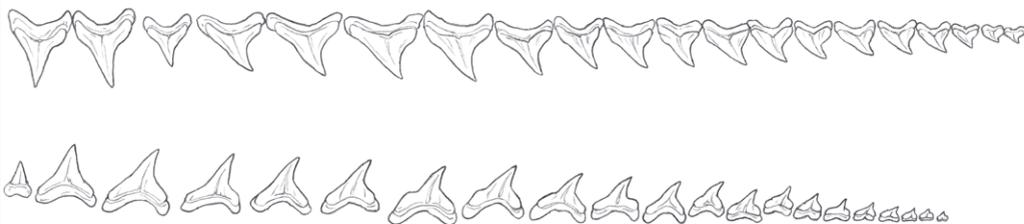
- Grey, blue, brown or blackish dorsally.
- Pectoral, pelvic and dorsal fins blackish.
- White spots sometimes present on fin tips.
- Ventrally white to above the pectoral fins<sup>ii</sup>.

## BIOLOGY AND SIZE

- Born: 114–160cm<sup>vi</sup>. Mature: 330cm ♀, 260–450cm ♂. Max TL: 760cm<sup>iv</sup>.
- Maintains its body temperature through a heat-exchange system allowing it to range into temperate regions<sup>v</sup>.
- Uses its tail to disorientate, stun and kill prey<sup>iv</sup>.
- Feeds primarily on schooling fish such as mackerel, bluefishes and needlefishes, also squid, octopi, crustaceans and seabirds<sup>iii</sup>.



## TEETH

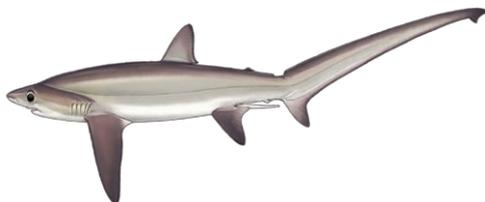


- Small, blade like, smooth edged teeth.
- 40 (20–20) in upper jaw, 42 (21–21) in lower jaw<sup>iv</sup>.

## SIMILAR SPECIES



- Alopias vulpinus*, **Thresher Shark**



- Alopias superciliosus*, **Bigeye Thresher Shark**

## HABITAT

- Pelagic species found from the surface to 336m<sup>ii</sup>, possibly to 550m.
- Give birth inshore, where young remain until close to maturity.
- Segregate by size and sex<sup>vi</sup>.

## CONSERVATION STATUS

- Targeted fisheries have lead to stock declines in some areas. Significant numbers are taken as bycatch across its range<sup>iii</sup>.
- Red List status:** Vulnerable (2008).  
Near Threatened in northeast Atlantic.

## COMMERCIAL IMPORTANCE

- Taken mostly as bycatch in the northeast Atlantic and Mediterranean Sea.
- Meat and fins are highly prized. Liver oil has previously been processed for vitamins<sup>ii</sup>.
- Sought by recreational anglers as it is a hard fighting species which regularly breaches when hooked<sup>iii</sup>.
- 2010 – Prohibition on commercial fishers targeting this species in the ICCAT convention area.

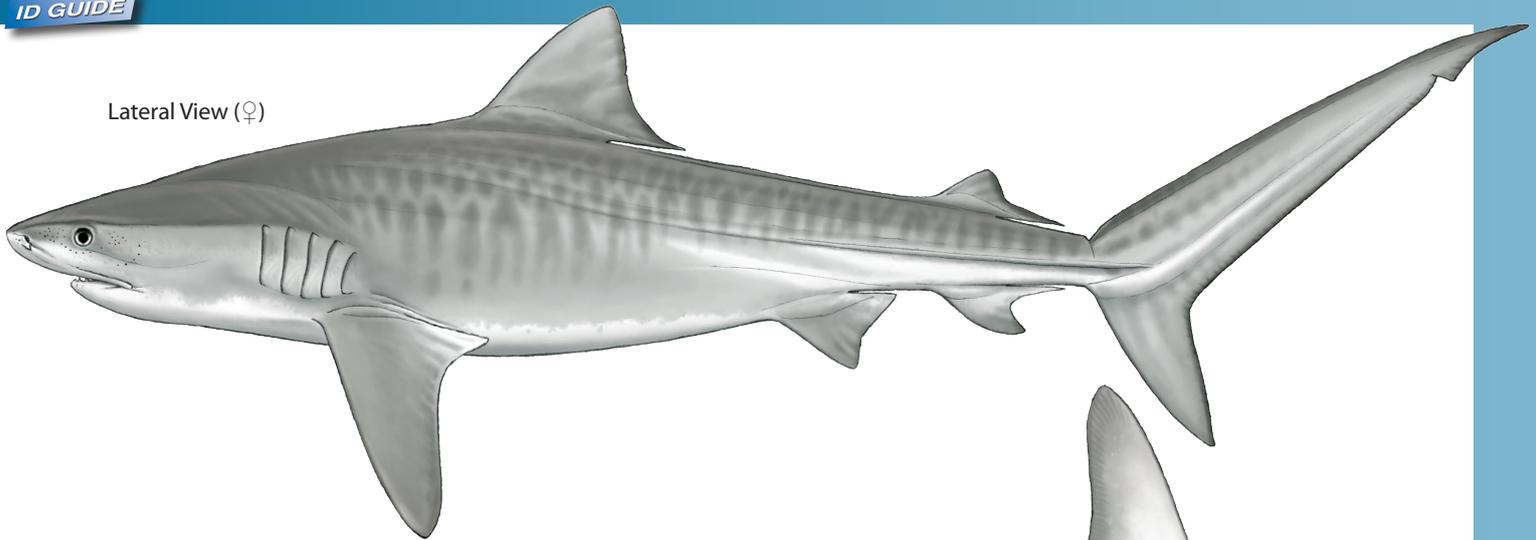
## HANDLING

- Handle with care.
- Long, powerful tail can cause serious injury.
- Potentially dangerous bite. Sharp teeth and powerful jaws.

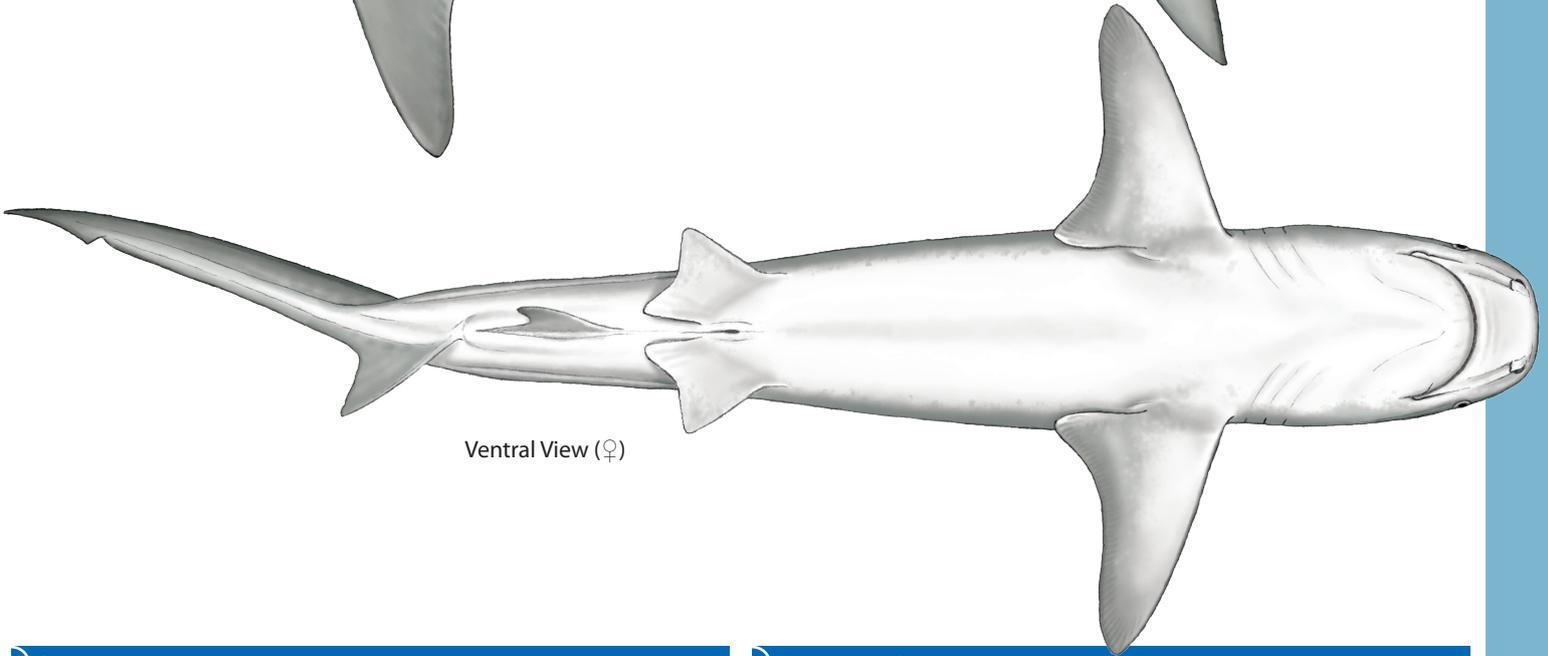
## REFERENCES

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- ii. Compagno, L. J. V.; 1984. FAO.
- iii. Goldman, K. J. *et al*; 2002. IUCN Red List.
- iv. Jordan, V; Unknown. FLMNH.
- v. Martin, R. A.; 1992. ReefQuest Centre for Shark Research.
- vi. Smith, S. E. *et al*; 2008. Blackwell Publishing.

Lateral View (♀)



Ventral View (♀)



### COMMON NAMES

**Tiger Shark**, Leopard Shark, Maneater Shark, Spotted Shark, Requin Tigre Commun (Fr), Tintorera (Es).

### SYNONYMS

*Squalus cuvier* (Péron & LeSueur, 1822), *Squalus arcticus* (Faber, 1829), *Galeus cepedianus* (Agassiz, 1838), *Galeocerdo tigrinus* (Müller & Henle, 1839), *Galeus maculatus* (Ranzani, 1840), *Carcharias* (*Prionodon*) *fasciatus* (Bleeker, 1852), *Galeocerdo rayneri* (McDonald & Barron, 1868), *Galeocerdo obtusus* (Klunzinger, 1871), *Carcharias hemprichii* (Hilgendorf, in Hemprich & Ehrenberg, 1899).

### DISTRIBUTION



The Tiger Shark is found circumglobally in tropical and temperate waters. In the northeast Atlantic it is probably wide ranging and has been confirmed from Morocco, the Canary Isles, Senegal, Gambia, Guinea, the Ivory Coast and Ghana. There is a record from Iceland, presumably a vagrant (Compagno, 1984).

### APPEARANCE

- Very short, blunt snout with large subterminal mouth.
- Long labial furrows which reach eyes. Large spiracles.
- Body more slender behind pectoral fins.
- Slender caudal fin with acutely pointed tip.
- Interdorsal ridge present.
- Anal fin strongly recurved.
- Dark, vertical, tiger-stripe markings, faded on older specimens.
- Bluish-green to dark grey or black dorsally.
- Normally to a maximum of 550cm. Unconfirmed reports to 910cm.

A highly distinctive shark, adults are unlikely to be confused with other Carcharhinids as it grows seven times larger than any other species in the family (Martin, Unknown). The head is large and broad, as is the subterminal mouth. The eyes and spiracles are also large (Compagno, 1984). The spiracles are slit-like, a unique trait among Carcharhinids (Martin, Unknown). Behind the pectoral fins the body becomes thinner to a slender caudal fin with an acutely pointed tip. There is an interdorsal ridge and the anal fin is strongly recurved (Compagno, 1984).

The Tiger Shark gets its common name from the dark stripes running vertically along its back. These are prominent in younger individuals but fade with age. The background dorsal colouration is bluish-green to dark grey or even black. It is ventrally white or yellow-white (Knickle, Unknown). The maximum reported size is 740cm from a female caught off Indo-China. Normally, it does not exceed 550cm although there are anecdotal reports of individuals to 910cm (Compagno, 1984).

## SIMILAR SPECIES

*Carcharhinus longimanus*, Oceanic Whitetip Shark

*Carcharhinus plumbeus*, Sandbar Shark

*Carcharhinus brachyurus*, Copper Shark

*Carcharhinus falciformis*, Silky Shark

*Galeocerdo cuvier*,  
Tiger Shark

*Carcharhinus longimanus*,  
Oceanic Whitetip Shark

*Carcharhinus plumbeus*,  
Sandbar Shark

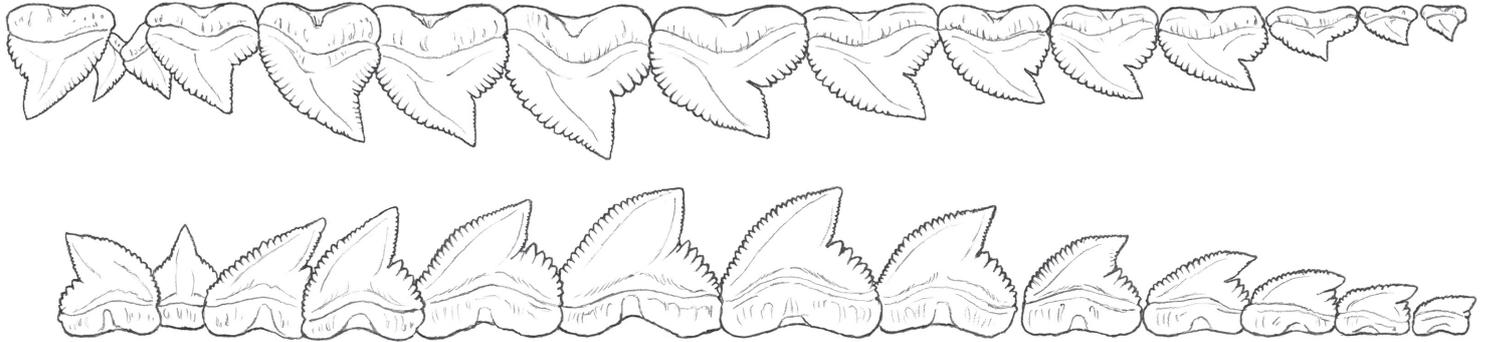
*Carcharhinus brachyurus*,  
Copper Shark

*Carcharhinus falciformis*,  
Silky Shark

(Not to scale)

### TEETH

The upper and lower teeth are similar in shape and size, having curved cusps and serrated edges. Each has a deep notch on the outer margin and is lined with numerous cusplets. They decrease in size but stay relatively similar towards the corners of the mouth (Knickle, Unknown).



### ECOLOGY AND BIOLOGY

#### HABITAT

The Tiger Shark is known from a wide variety of habitats but generally prefers turbid coastal waters, commonly estuaries, harbours, lagoons and other inlets where nutrient run-off may increase the availability of prey. It can be found from the surface to at least 350m. Capable of long migrations, it is known to move into cooler waters during the warmer months and back into warmer areas during the colder months. It can also travel long distances between oceanic islands in short amounts of time (Knickle, Unknown). Diurnal migrations are known to occur with some tagged sharks moving inshore at night. This was not observed in a Hawaiian tagging project (Holland *et al.*, 1999).

#### EGGCASE

N/A

#### DIET

The Tiger Shark is a predator and scavenger that has one of the widest and most variable diets of any shark. This includes teleost fish, elasmobranchs, marine reptiles, seabirds (including migrating land birds), marine mammals, molluscs, crustaceans, gastropods, tunicates and carrion. It has also earned a reputation as a 'garbage can with fins' due to the vast number of different inedible items found among its stomach contents, including leather, fabrics, pieces of coal and wood, seeds and other vegetable material, feathers, plastic bags, burlap bags, small barrels, cans and pieces of metal (Compagno, 1984).

#### REPRODUCTION

Females reach maturity at a length of 250–325cm, males at a length of 226–290cm (Knickle, Unknown). It is the only species in the Carcharhinidae family that reproduces ovovivipariously which, along with other factors, has led some researchers to suggest that it be placed in its own family (Martin, Unknown). The gestation period is 14–16 months and litters of 10–82 have been reported (Knickle, Unknown; Compagno, 1984).

## COMMERCIAL IMPORTANCE

Relatively common worldwide, the Tiger Shark is taken in target fisheries and as bycatch throughout its range. Its meat, fins, liver oil and hide can all be utilised (Simpfendorfer, 2000). Its jaws and teeth are highly valuable in the curio trade and it is also a popular game fish due to its large size and ferocious reputation (Randall, 1992; Knickle, Unknown). These traits also make it a popular species for recreational divers seeking large sharks (Knickle, Unknown).

## THREATS, CONSERVATION, LEGISLATION

A relatively fast growing and highly fecund species, the Tiger Shark is more resilient to fishing pressure than many other large shark species. However, there is evidence from commercial and recreational anglers that declines have occurred in many areas where it is heavily fished, including the mid-Atlantic. It has been reported that juvenile survival rates increase when adult populations drop due to fewer incidences of cannibalism (Simpfendorfer, 2000).

## IUCN RED LIST ASSESSMENT

Near Threatened (2000).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

### REFERENCES

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Text: Richard Hurst.  
Illustrations: Marc Dando.

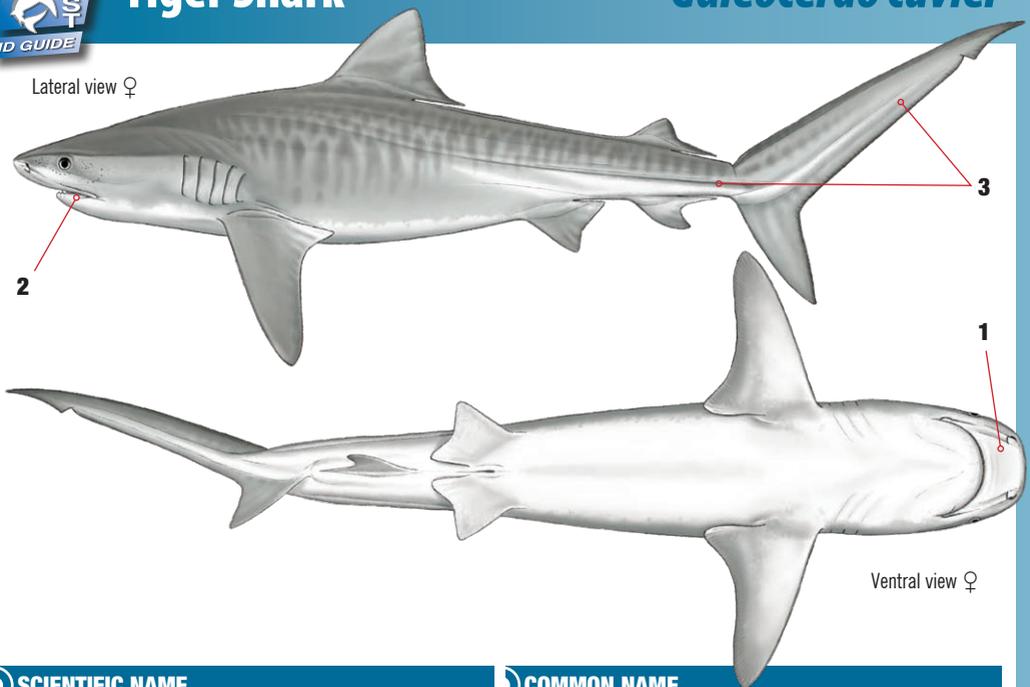
#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

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Lateral view ♀

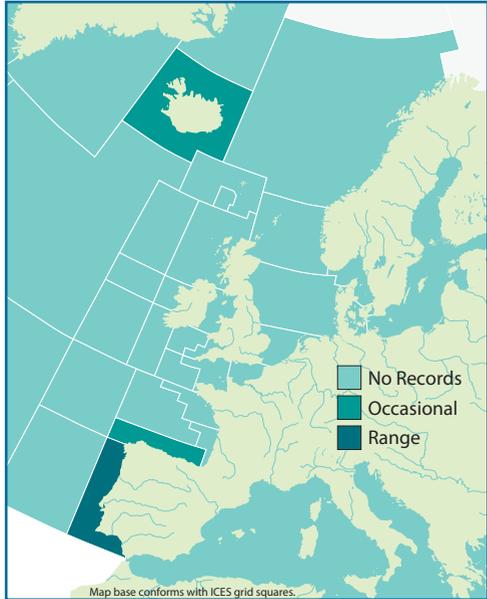
Ventral view ♀

### SCIENTIFIC NAME

*Galeocerdo cuvier* (Péron & LeSueur, 1822).

### DISTRIBUTION

Circumglobal in warm temperate and tropical waters, excluding the Mediterranean. Recorded as a vagrant from Iceland and possibly the UK<sup>iii</sup>.



### COMMON NAME

**TIGER SHARK**, Leopard Shark, Maneater Shark, Spotted Shark, Requin Tigre Commun (Fr), Tintorerera (Es).

### IDENTIFICATION

- 1 Very short, blunt snout.
- 2 Large mouth reaching well behind eyes.
- 3 Heterocercal caudal fin with low keels<sup>i</sup>.

### COLOUR

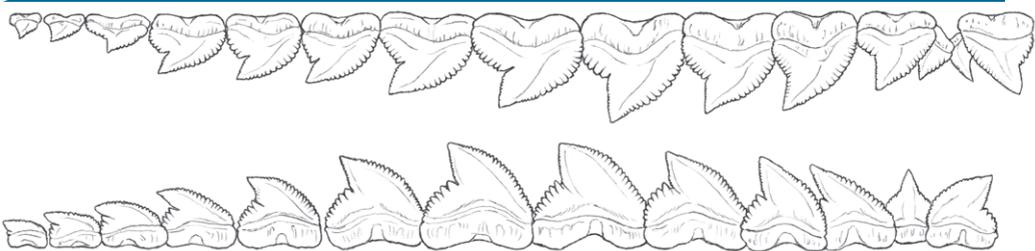
- Deep blue/grey to black dorsally.
- Pale yellow to white ventrally.
- Dark spots and stripes prominent in young animals, fade with age<sup>iii</sup>.

### BIOLOGY AND SIZE

- Born: 51–76cm. Mature: 250–350cm ♀, 226–290cm ♂. Max TL: >550cm, possibly to 740cm<sup>i</sup>.
- Gestation period 12–14 months<sup>iii</sup> with litters of 10–82 pups recorded<sup>i</sup>.
- Primarily a piscivore but has a highly varied diet including reptiles, sea snakes, sea birds, marine mammals, molluscs, crustaceans, carrion and garbage<sup>i</sup>.



## TEETH



- ◉ Curved cusps with finely serrated edges.
- ◉ Deep notch on outer margin of each tooth with numerous cusplets<sup>iii</sup>.
- ◉ 36–51 rows of teeth<sup>i</sup>.

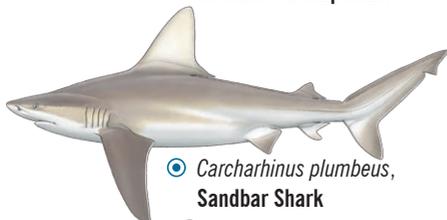
## SIMILAR SPECIES



◉ *Galeocerdo cuvier*, **Tiger Shark**



◉ *Carcharhinus longimanus*,  
**Oceanic Whitetip Shark**



◉ *Carcharhinus plumbeus*,  
**Sandbar Shark**



◉ *Carcharhinus falciformis*,  
**Silky Shark**



◉ *Carcharhinus brachyurus*,  
**Copper Shark**

## HABITAT

- ◉ Surface to possibly 350m. Prefers shallow areas such as bays, estuaries and lagoons.
- ◉ Migratory with temperature, moving into temperate waters in warmer months. Individuals recorded from Iceland and northern Europe most likely followed the Gulf Stream<sup>iii</sup>.
- ◉ Makes diurnal migrations inshore at night across much of its range. Hawaiian research has shown sharks there are found inshore at all times<sup>ii</sup>.

## CONSERVATION STATUS

- ◉ Relatively fast growing and fecund species but regularly taken in target and non target fisheries. Declines have been observed in several populations<sup>iv</sup>.
- ◉ **Red List status:** Near Threatened (2000).

## COMMERCIAL IMPORTANCE

- ◉ Targeted throughout its range for its highly valuable fins, liver, hide and meat<sup>v</sup>. Jaws and teeth are valued in the curio trade<sup>vi</sup>.
- ◉ Highly sought after big game fish for recreational anglers due to its large size and aggressive appearance<sup>iii</sup>.
- ◉ Increasingly important species for dive tourism.

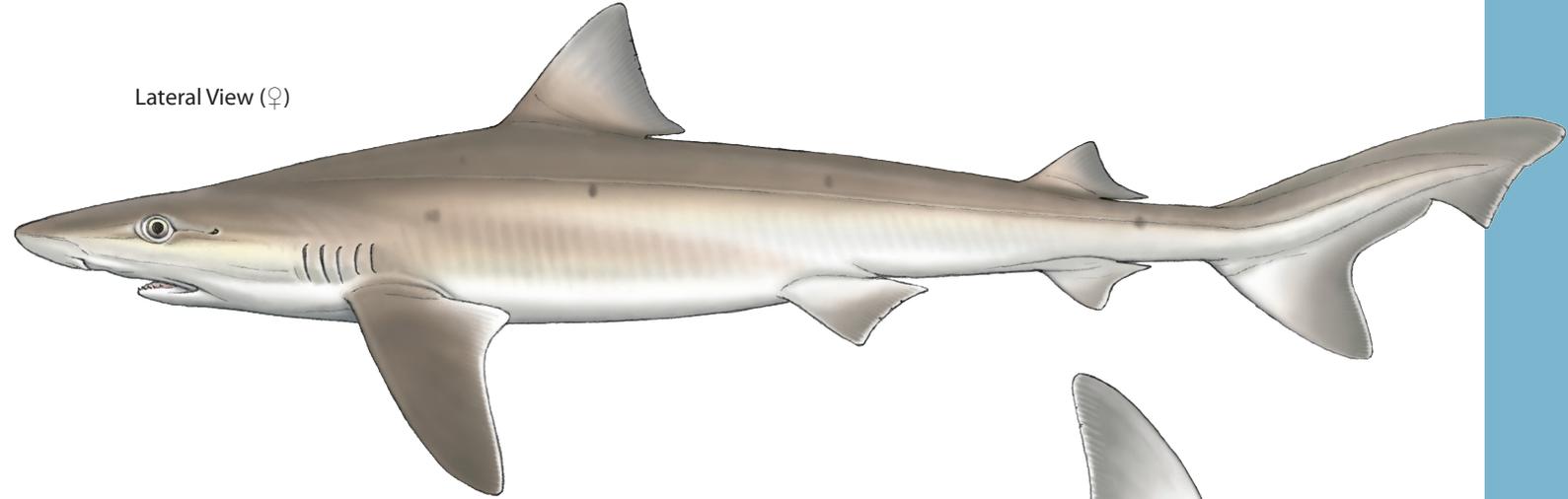
## HANDLING

- ◉ Handle with care. Large, powerful shark.
- ◉ Sharp teeth and abrasive skin.

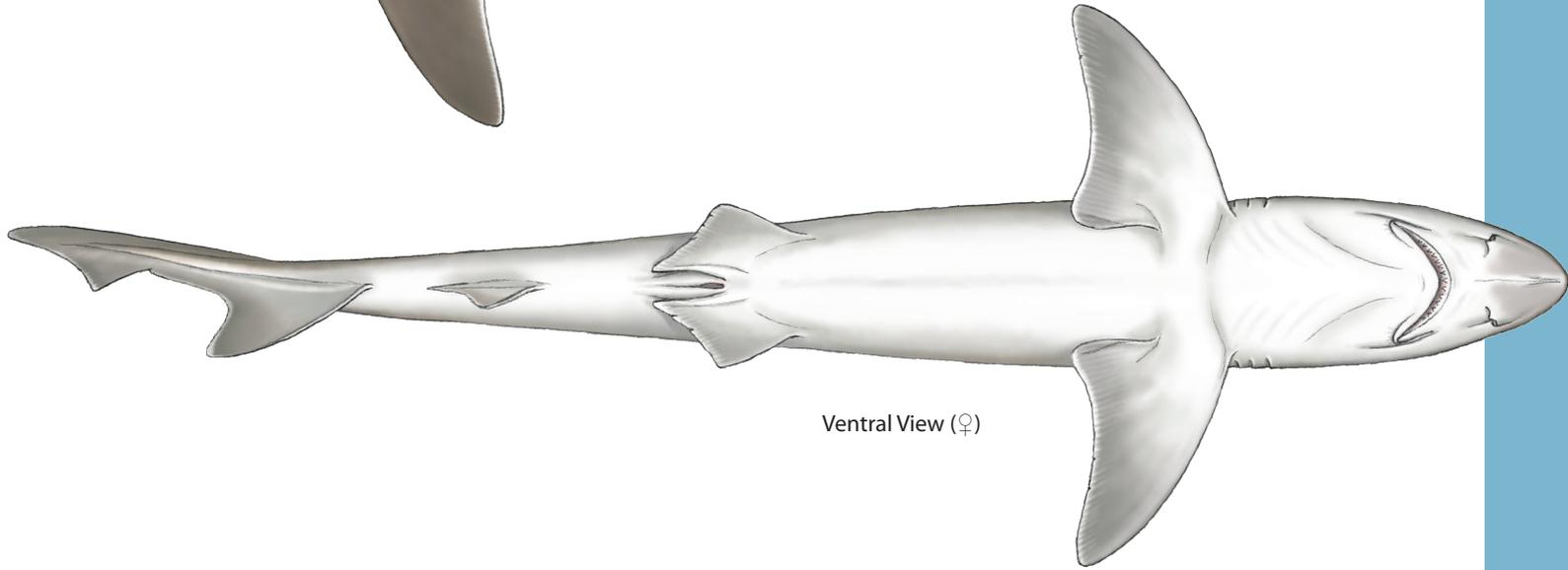
## REFERENCES

- i. Compagno, L. J. V.; 1984. *FAO*.
- ii. Holland, K. N. *et al*; 1999. *Marine Biology*.
- iii. Knickle, C; Unknown. *FLMNH*.
- iv. Randall, J. E; 1992. *Australian Journal of Marine and Freshwater Research*.
- v. Simpfendorfer, C; 2000. *IUCN Red List*.

Lateral View (♀)



Ventral View (♀)



## SYNONYMS

*Squalus galeus* (Linnaeus 1758), *Galeus vulgaris* (Fleming 1828), *Galeus canis* (Bonaparte 1834), *Galeus nilssonii* (Bonaparte 1846), *Galeus communis* (Owen 1853), *Galeus linnei* (Malm 1877), *Galeus australis* (Macleay 1881), *Galeorhinus australis* (Macleay 1881), *Galeorhinus zyopterus* (Jordan & Gilbert 1883), *Galeus zyopterus* (Jordan & Gilbert 1883), *Galeorhinus chilensis* (Perez Canto 1886), *Galeus chilensis* (Perez Canto 1886), *Galeus molinae* (Philippi 1887), *Carcharhinus cyrano* (Whitley 1930), *Galeorhinus vitaminicus* (de Buen 1950).

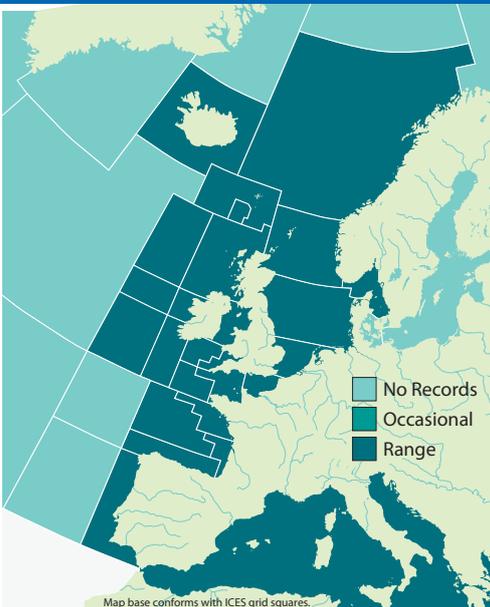
## COMMON NAMES

Tope Shark, Soupfin Shark, School Shark, Flake, Greys shark, Penny's Dog, Schnapper Shark, Sharpie Shark, Sweet William Shark, Vitamin Shark, Requin-hâ (Fr), Cazón (Es).

## APPEARANCE

- Maximum total length of 193 ♂- 195 ♀cm.
- Second dorsal fin and anal fin approximately the same size.
- Large caudal lobe extending ~half the length of the dorsal caudal margin.
- Slender with a long snout and large mouth.
- Bluish grey to light brown colouration on dorsal surface.
- Paler ventral surface.

## DISTRIBUTION



The Tope Shark is found in the east Atlantic from Iceland to South Africa, including the Mediterranean where it is present but uncommon (Bester, Unknown; Walker *et al.*, 2006). It is known from the southwest Atlantic, the west Indian Ocean and the Pacific Ocean (Bester, Unknown).

The Tope Shark is a large houndshark reaching lengths of nearly 200cm. The main distinguishing features are the small second dorsal fin (approximately the same size as the anal fin and located almost above it) and the large lobe on the caudal fin. A slender shark, its snout is very long and its mouth broad. The eyes are horizontally oval and are situated just in front of pronounced spiracles (Compagno, 1984).

Colouration varies from dark grey to light brown on the dorsal surface. Some light brown individuals have darker, almost black spots and juveniles (<60cm TL) have black markings on their fin tips. Juveniles also have white trailing edges on their pectoral fins. The ventral surface is paler to white (Barnes, 2008). The Tope Shark can reach a maximum age of 60 years (Bester, Unknown).

## SIMILAR SPECIES

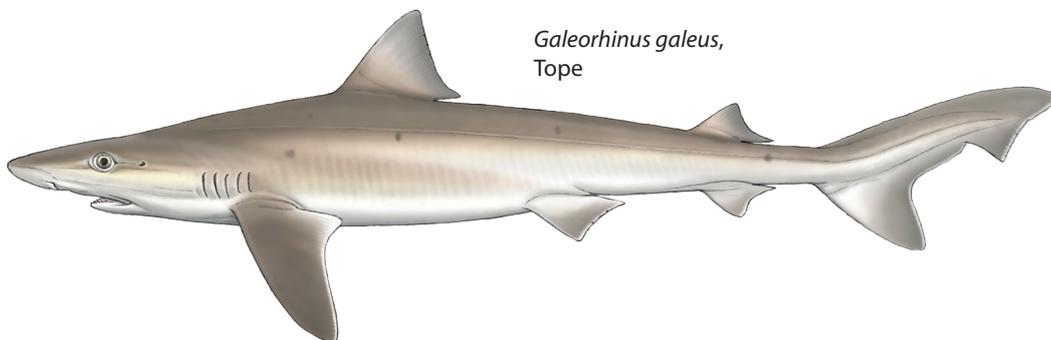
*Squalus acanthias*, Spiny Dogfish

*Mustelus mustelus*, Common Smoothhound

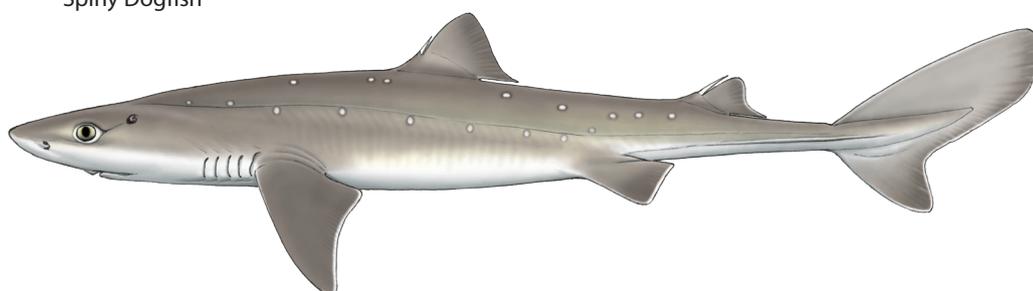
*Mustelus asterias*, Starry Smoothhound

*Prionace glauca*, Blue Shark

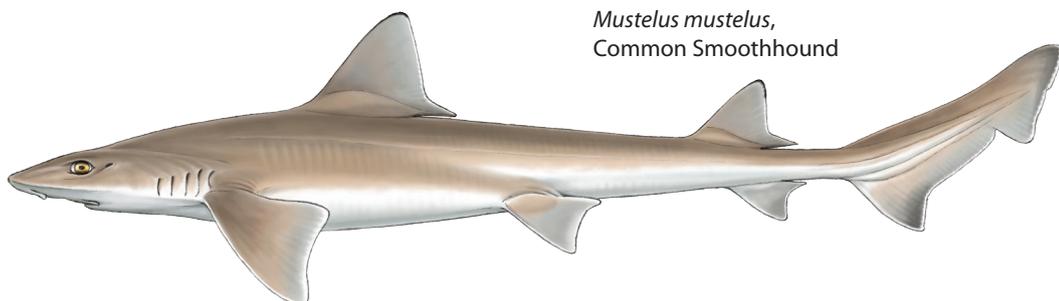
*Galeorhinus galeus*,  
Tope



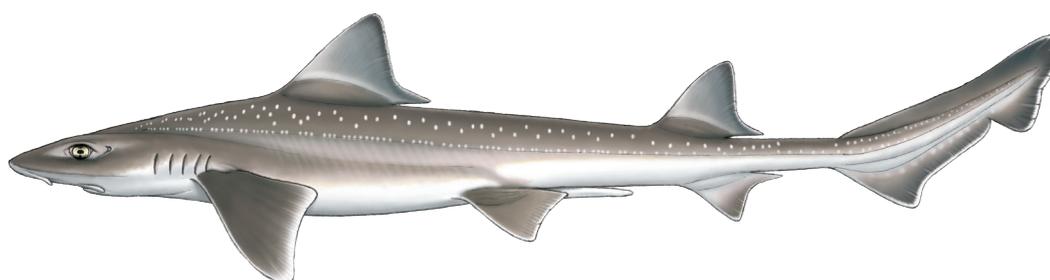
*Squalus acanthias*,  
Spiny Dogfish



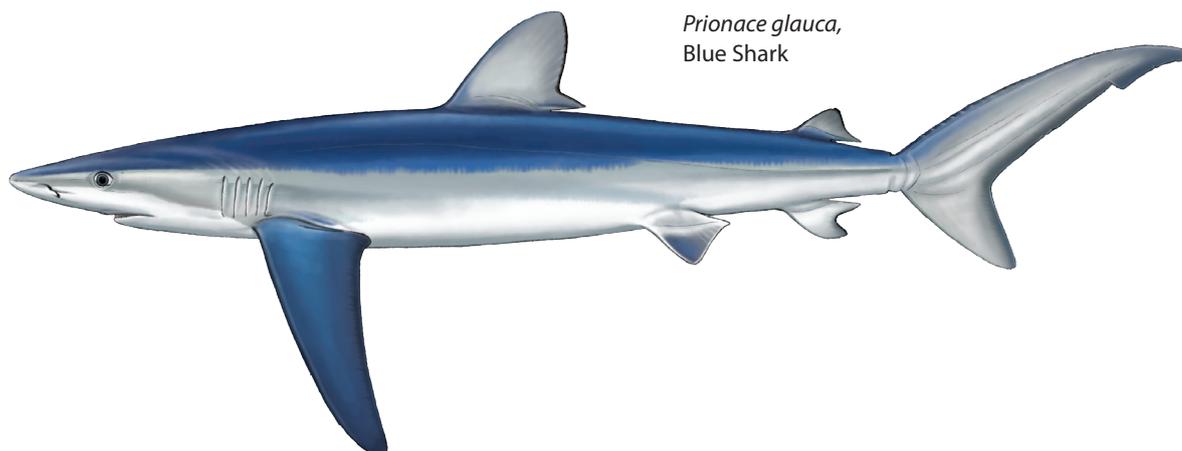
*Mustelus mustelus*,  
Common Smoothhound



*Mustelus asterias*,  
Starry Smoothhound



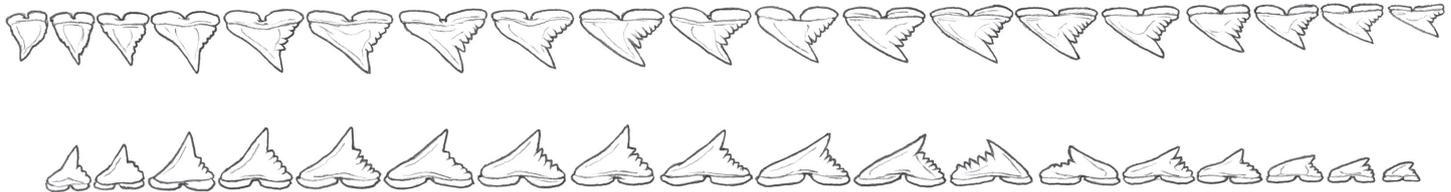
*Prionace glauca*,  
Blue Shark



(Not to scale)

## TEETH

The teeth are blade-like with oblique cusps and distal cusplets in both jaws (Compagno, 1984).



## ECOLOGY AND BIOLOGY

### HABITAT

The Tope Shark is an active, strong swimming shark found from shallow bays to ~550m. It is predominantly encountered near the seabed but has also been caught on pelagic longlines (Bester, Unknown). At higher latitudes such as European waters, the Tope Shark is highly migratory, moving towards the poles in summer and towards the equator in winter. In lower latitudes, it is known to migrate between shallow waters during the summer and deeper water in the winter months (Compagno, 1984). It is a strong swimmer capable of covering 35 miles a day (Walker *et al.*, 2006).

### DIET

The Tope Shark feeds on a variety of bony fishes, listed by the Florida Museum of Natural History as including pilchards, herring, sardines, anchovies, salmon, smelt, hake, cod, midshipmen, flying fish, barracuda, mackerel, tuna, croakers, wrasses, damselfishes, gobies, kelpfish, sole, halibut, scorpion fish, and sculpins. It also feeds on invertebrates such as squid, octopus, crabs, marine snails, and sea urchins (Bester, Unknown).

A 2001 study of the Tope Shark in Argentinean waters revealed that Hake, Cuskeels (*Genypterus blacodes* and *Raneya brasiliensis*), Silverside (*Odontesthes* sp.) and Squid (*Illex argentinus*) were the most common prey items (Rodriguez *et al.*, 2004). It appears that it is not inclined to scavenge due to the virtual absence of terrestrial animals, larger marine species and litter in its stomach. It is also less inclined to take stale or frozen bait, preferring hooks baited with fresh meat (Compagno, 1984).

### REPRODUCTION

The Tope Shark is an ovoviviparous species, meaning it gives birth to live young. Sexual maturity is reached at a total length of 120–170cm for males and 130–185cm for females. This corresponds to an age of 8 and 11 years respectively (Compagno, 1984). It remains in sex segregated groups for the majority of the year with the exception of mating, which takes place during the spring (Shark Foundation, 2005). The gestation period is approximately 12 months, after which females move into shallow areas and bays to give birth to litters of 6–52 pups, depending on the size of the mother. These pups measure from 30–35cm in length and remain in the nursing areas for their first year or two (Walker *et al.*, 2006).

### EGGCASE

N/A

## COMMERCIAL IMPORTANCE

One of the most widely fished shark species, its meat is used fresh and dried/salted for human consumption, its fins for the Asian shark fin trade, its liver for oil and its skin for leather products. In the period between 1936 and 1944, the Tope Shark was the mainstay of a massive shark fishery in the eastern Pacific, during which over 24,000,000 lbs (10,886.22 t) were landed, mainly for their vitamin A content. This fishery ended quite abruptly with the synthesis of vitamin A (Walker *et al.*, 2006).

The Tope Shark is a very popular species with recreational fishers as it is one of the largest species that can be targeted in UK waters and is renowned for its fight (SACN, 2008). The recreational angling sector is thought to be worth €25 billion across Europe. In comparison, the value of commercial landings in 1998 was only €20 billion (Pawson *et al.*, 2004). The vast majority of sharks caught by recreational anglers are returned alive and are increasingly being measured and tagged before release (Bester, Unknown).

## THREATS, CONSERVATION, LEGISLATION

Like most sharks, the Tope shark is extremely vulnerable to fishing pressure due to its slow maturity and low productivity. While there is no large scale directed fishery for the Tope Shark in European waters, it is regularly taken as bycatch of mixed demersal and pelagic fisheries, especially by French vessels fishing in the English Channel, Western Approaches and the northern Bay of Biscay (Walker *et al.*, 2006). Rapidly declining populations have led to England and Wales imposing a ban on targeting the Tope Shark except using rod and line fishing methods. All Tope caught in this way must be returned to the sea alive or dead. Commercial fishermen cannot target the species and are limited to a 45kg/day bycatch limit, regardless of the fishing gear used (SACN, 2008).

## IUCN RED LIST ASSESSMENT

Vulnerable (2005).

Data Deficient in northeast Atlantic.

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

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Text: Richard Hurst.  
Illustrations: Marc Dando.

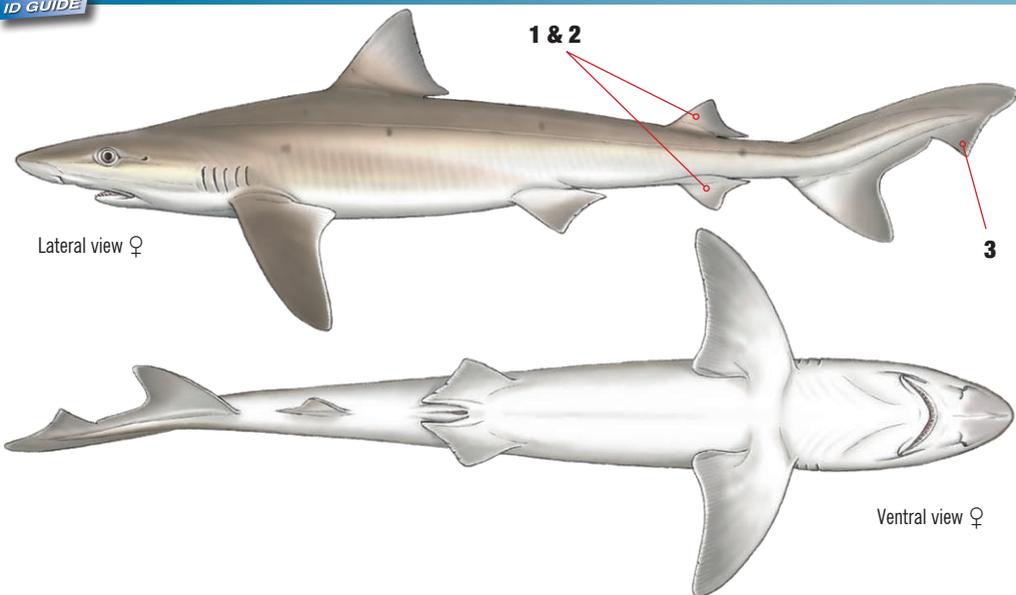
### Citation

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Lateral view ♀

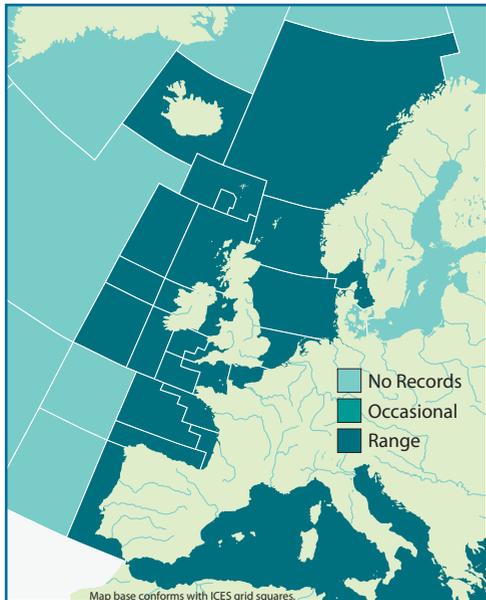
Ventral view ♀

## SCIENTIFIC NAME

*Galeorhinus galeus* (Linnaeus, 1758).

## DISTRIBUTION

Worldwide in temperate seas except western Atlantic and western Pacific<sup>i</sup>. East Atlantic from Iceland to South Africa<sup>ii</sup>, including the Mediterranean Sea<sup>v</sup>.



## COMMON NAME

**TOPE**, Soupfin Shark, School Shark, Flake, Greys shark, Penny's Dog, Schnapper Shark, Sharpie Shark, Sweet William Shark, Vitamin Shark, Requin-hâ (Fr), Cazón (Es).

## IDENTIFICATION

- 1 Small second dorsal fin, same size as anal fin.
- 2 Second dorsal fin directly above anal fin.
- 3 Very large caudal lobe<sup>iii</sup>.

## COLOUR

- Blue/grey dorsal surface.
- Sometimes light brown.
- Paler/white ventral surface<sup>i</sup>.

## BIOLOGY AND SIZE

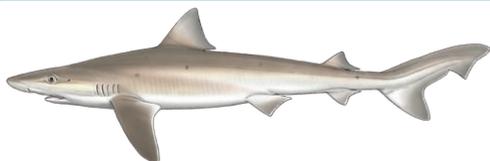
- Born: 30–35cm<sup>v</sup>. Mature: 130–185cm ♀, 120–170cm ♂. Max TL: 195cm ♀, 175cm ♂<sup>iii</sup>.
- Feeds on a wide variety of bony fish, elasmobranchs and squid<sup>ii</sup>. Does not appear inclined to scavenge<sup>iii</sup>.
- Segregates by sex, except during mating periods<sup>v</sup>.

## TEETH

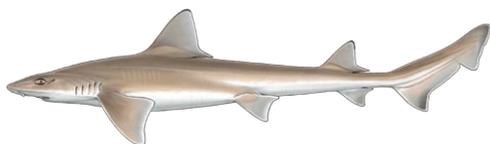


- ◉ Blade-like with oblique cusps and distal cusplets<sup>iii</sup>.

## SIMILAR SPECIES



- ◉ *Galeorhinus galeus*, **Tope**



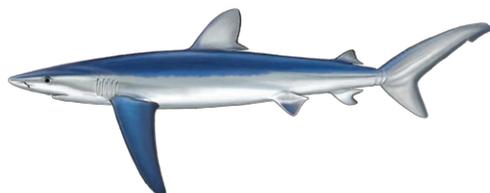
- ◉ *Mustelus mustelus*, **Common Smoothhound**



- ◉ *Mustelus asterias*, **Starry Smoothhound**



- ◉ *Squalus acanthias*, **Spiny Dogfish**



- ◉ *Prionace glauca*, **Blue Shark**

## HABITAT

- ◉ Shallows to ~550m.
- ◉ Predominantly demersal but may be caught on pelagic longlines<sup>ii</sup>.
- ◉ Highly migratory, moving towards the poles during summer<sup>iii</sup>.

## CONSERVATION STATUS

- ◉ Late maturity and low reproductive potential make Tope vulnerable to overfishing<sup>v</sup>.
- ◉ **Red List status:** Vulnerable (2005). Data Deficient in northeast Atlantic.

## COMMERCIAL IMPORTANCE

- ◉ One of the most widely fished shark species.
- ◉ Regularly taken as bycatch and targeted where abundant.
- ◉ Flesh, fins and liver oil are all utilized<sup>v</sup>.
- ◉ Landings restricted in UK waters.

## HANDLING

- ◉ Handle with care.
- ◉ Sharp teeth.
- ◉ Abrasive skin.

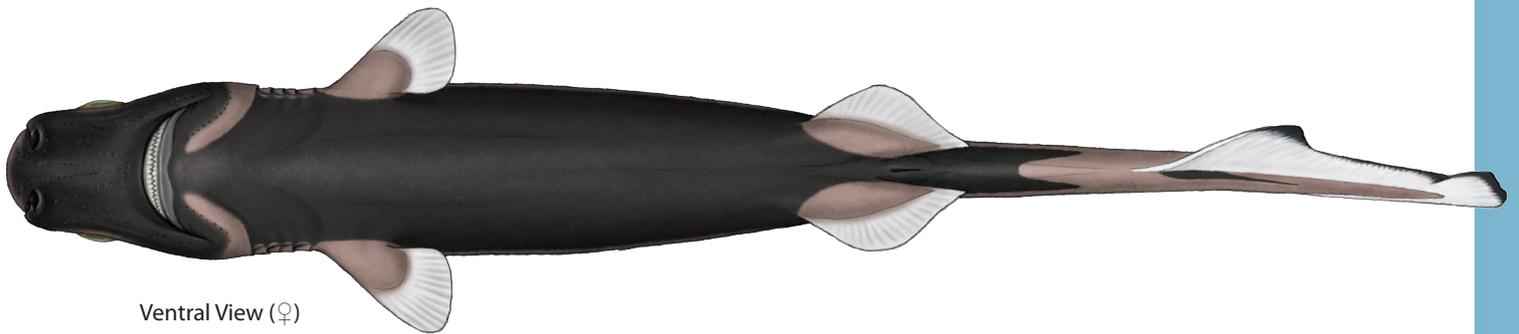
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- i. Barnes, M. K. S.; 2008. MBA.
- ii. Bester, C; Unknown. FLMNH.
- iii. Compagno, L. J. V.; 1984. FAO.
- iv. Shark Foundation; 2005.
- v. Walker, T. I. *et al*; 2006. IUCN Red List.

Lateral View (♀)



Ventral View (♀)



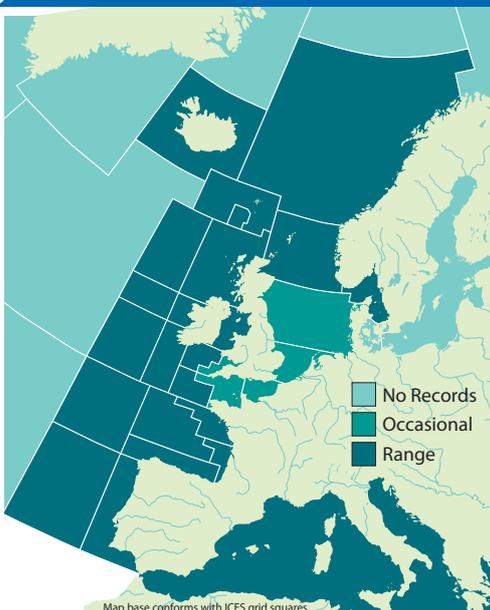
### COMMON NAMES

**Velvet Belly Lanternshark**, Black Centrina, Sagre Commun (Fr), Negrito (Es).

### SYNONYMS

*Etmopterus spinax* (Linnaeus, 1758), *Squalus spinax* (Linnaeus, 1758), *Squalus niger* (Gunnerus, 1762), *Etmopterus aculeatus* (Rafinesque, 1810), *Squalus infernus* (Blainville, 1825), *Spinax gunneri* (Reinhardt, 1825), *Spinax vitalinus* (de la Pylaie, 1835), *Spinax linnei* (Malm, 1877).

### DISTRIBUTION



The Velvet Belly Lanternshark is found in the east Atlantic from Iceland and Norway to Gabon, including the western Mediterranean. It is also known from the Azores, the Cape Verde Islands and South Africa (Compagno, 1984).

### APPEARANCE

- Small first dorsal fin set well behind pectoral fins.
- Larger second dorsal fin behind pelvic fins.
- Well developed spines with each dorsal fin.
- No anal fin.
- Long dorsal lobe of caudal fin.
- Very small ventral lobe of caudal fin.
- Lower teeth slender and blade-like.
- Upper teeth with cusps and cusplets.
- Dorsal surface brown.
- Ventral surface black with prominent black markings on sides of tail.
- Light emitting photophores on ventral surface.
- Maximum total length 60cm, rare above 45cm.

The Velvet Belly Lanternshark is a stout bodied lanternshark with a fairly long tail and prominent markings which is unlikely to be misidentified in the North Atlantic. Like other lanternsharks its first dorsal fin is small and set back along the body, well behind the pectoral fins. The second dorsal fin is larger and behind the pelvic fins. Both have a large spine. There is no anal fin. The dorsal lobe of the caudal fin is very long while the ventral lobe is very small (Compagno, 1984).

Colouration on the dorsal surface is plain brown. Usually, the ventral surface is darker to black. There are prominent black markings behind the pelvic fins and along the tail. There are light emitting photophores on the ventral surface (Shark Foundation, 2005). The maximum total length is 60cm and it is rare above 45cm (Compagno, 1984).

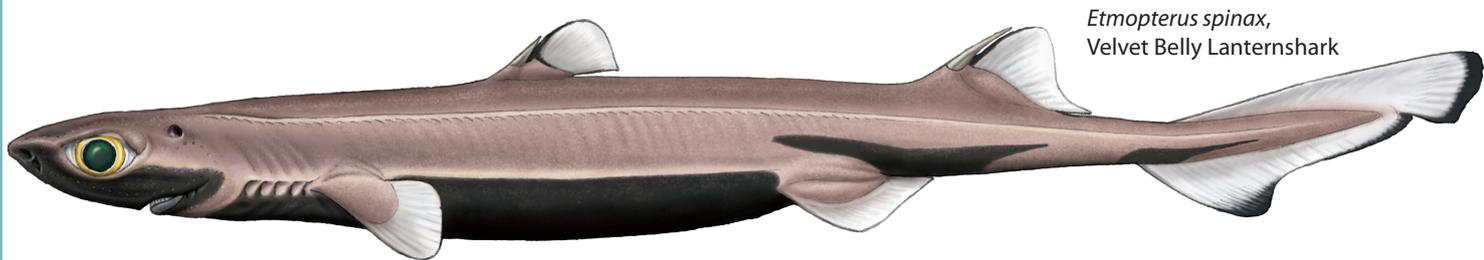
## SIMILAR SPECIES

*Etmopterus pusillus*, Smooth Lanternshark

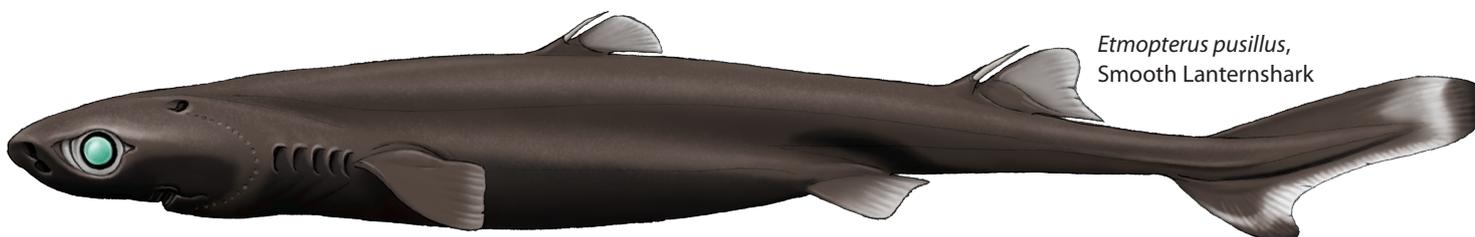
*Etmopterus princeps*, Greater Lanternshark

*Centroscyllium fabricii*, Black Dogfish

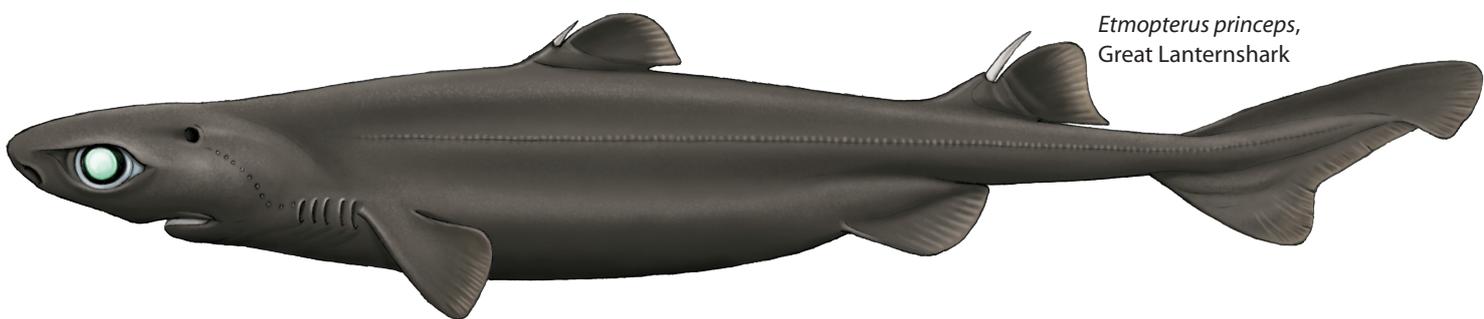
*Centroscyrnus coelolepis*, Portuguese Dogfish



*Etmopterus spinax*,  
Velvet Belly Lanternshark



*Etmopterus pusillus*,  
Smooth Lanternshark



*Etmopterus princeps*,  
Great Lanternshark



*Centroscyllium fabricii*,  
Black Dogfish



*Centroscyrnus coelolepis*,  
Portuguese Dogfish

(Not to scale)

### TEETH

The lower teeth are blade-like and unicuspidate. The upper teeth have cusps with three or fewer cusplets (Compagno, 1984).

### ECOLOGY AND BIOLOGY

#### HABITAT

The Velvet Belly Lanternshark is found on, near or well above the substrate from 70-2,000 metres, though mostly between 200 and 500m (Compagno, 1984). It is known to segregate by size into different depths with large, mature females found at the greatest depths (Gibson *et al.*, 2006).

#### EGGCASE

N/A

#### DIET

The diet of the Velvet Belly Lanternshark is poorly understood but is thought to include small fishes, molluscs and crustaceans (Shark Foundation, 2005).

#### REPRODUCTION

Both males and females reach sexual maturity at 33-35cm in length. It is an ovoviparous species. Litters of 6 to 20 pups have been recorded, each of which is born between 12 and 14cm in length (Shark Foundation, 2005).

## COMMERCIAL IMPORTANCE

The Velvet Belly Lanternshark is taken as bycatch in the eastern Atlantic in bottom and pelagic trawl fisheries. It is sometimes utilised for fishmeal and dried/salted for human consumption. It is probably unimportant but catch statistics are lacking (Compagno, 1984).

## THREATS, CONSERVATION, LEGISLATION

A non-commercial species, the Velvet Belly Lanternshark is taken as bycatch and is often discarded, severely limiting the landings data available. Scientific trawls from the Mediterranean, eastern central Atlantic and south Atlantic indicate that the population has not declined in these areas. Scientific trawls from the northeast Atlantic have shown population declines of up to 20% between the 1970's and 2004. Due to increasing deepwater fisheries effort and the typical deep-sea shark life history characteristics this species displays, it is likely that populations will continue to decline, at least at their current rate if not more rapidly (Gibson *et al.*, 2006).

In ICES sub-areas V, VI, VII, VIII and IX a Total Allowable Catch (TAC) of 1,646 tons (2008) applies to the deepwater sharks *Centroscymnus coelolepis*, *Centrophorus granulosus*, *C. squamosus*, *Deania calceus*, *Dalatias licha*, *Etmopterus princeps*, *E. spinax*, *Centroscyllium fabricii*, *Galeus melastomus*, *G. murinus* and all *Apristurus* spp. Additionally, these species have a TAC of 20 tons in sub-area X and a TAC of 49 tons (including *Deania histricosa* and *D. profundorum*) in sub-area XII (CPOA Shark, 2009).

## IUCN RED LIST ASSESSMENT

Least Concern (2008).

Near Threatened in northeast Atlantic.

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Well developed dorsal spines.
- Sharp teeth.
- Abrasive skin.

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Text: Richard Hurst.  
Illustrations: Marc Dando.

#### Citation

Shark Trust; 2010. An Illustrated Compendium of Sharks, Skates, Rays and Chimaera. Chapter 1: The British Isles and Northeast Atlantic. Part 2: Sharks.

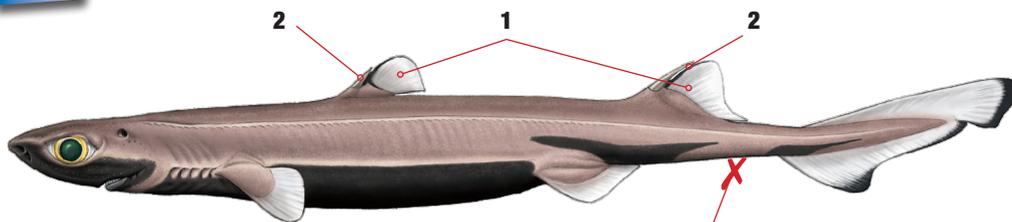
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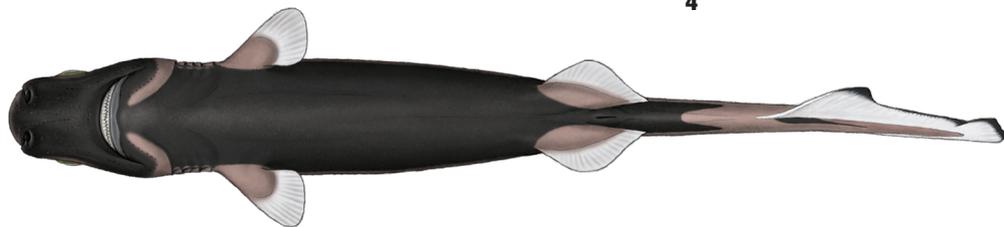
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# Velvet Belly Lanternshark *Etmopterus spinax*



Lateral view ♀



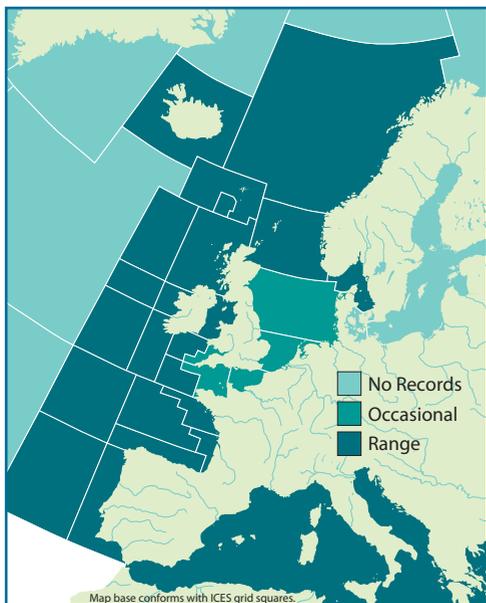
Ventral view ♀

## SCIENTIFIC NAME

*Etmopterus spinax* (Linnaeus, 1758).

## DISTRIBUTION

Iceland and Norway to Gabon, including the western Mediterranean. Also the Azores, the Cape Verde Islands and Cape Province, South Africa.



## COMMON NAME

**VELVET BELLY LANTERNSHARK**, Black Centrina, Sagre Commun (Fr), Negrito (Es).

## IDENTIFICATION

- 1 Second dorsal fin twice the size of first.
- 2 Large dorsal spines.
- 3 Light emitting photophores ventrally.
- 4 No anal fin<sup>ii</sup>.

## COLOUR

- Brown dorsally.
- Black ventrally.
- Prominent black markings on sides of tail and around pelvic fins<sup>iii</sup>.

## BIOLOGY AND SIZE

- Born: 12–14cm. Mature: 33–36cm. Max TL: 60cm<sup>ii</sup>.
- Litter sizes of 6–20 have been recorded<sup>ii</sup>.
- Feeds on fish, cephalopods, crustaceans and zooplankton<sup>iii</sup>.

## TEETH

- Blade-like unicuspidate lower teeth.
- Upper teeth with cusps and 3 or fewer cusplets<sup>i</sup>.

## SIMILAR SPECIES



- Etmopterus pusillus*, **Velvet Belly Lanternshark**



- Etmopterus pusillus*, **Smooth Lanternshark**



- Etmopterus princeps*, **Greater Lanternshark**



- Centroscyllium fabricii*, **Black Dogfish**



- Centroscymnus coelolepis*, **Portuguese Dogfish**

## HABITAT

- 70–2,000m, most common 200–500m<sup>i</sup>.
- Usually demersal but can be taken in pelagic trawls<sup>i</sup>.
- Segregate by sex and size with large mature females at the greatest depths<sup>ii</sup>.

## CONSERVATION STATUS

- Populations appear stable in the Mediterranean, South and eastern central Atlantic. Declines of ~20% have been recorded in the northeast Atlantic since the 1970's<sup>iii</sup>.
- Red List status:** Least Concern (2008). Near Threatened in the northeast Atlantic.

## COMMERCIAL IMPORTANCE

- Of little commercial importance but accurate data is lacking.
- Taken as bycatch in bottom and pelagic trawl fisheries.
- Can be utilised for fishmeal and dried-salted for human consumption<sup>i</sup>.

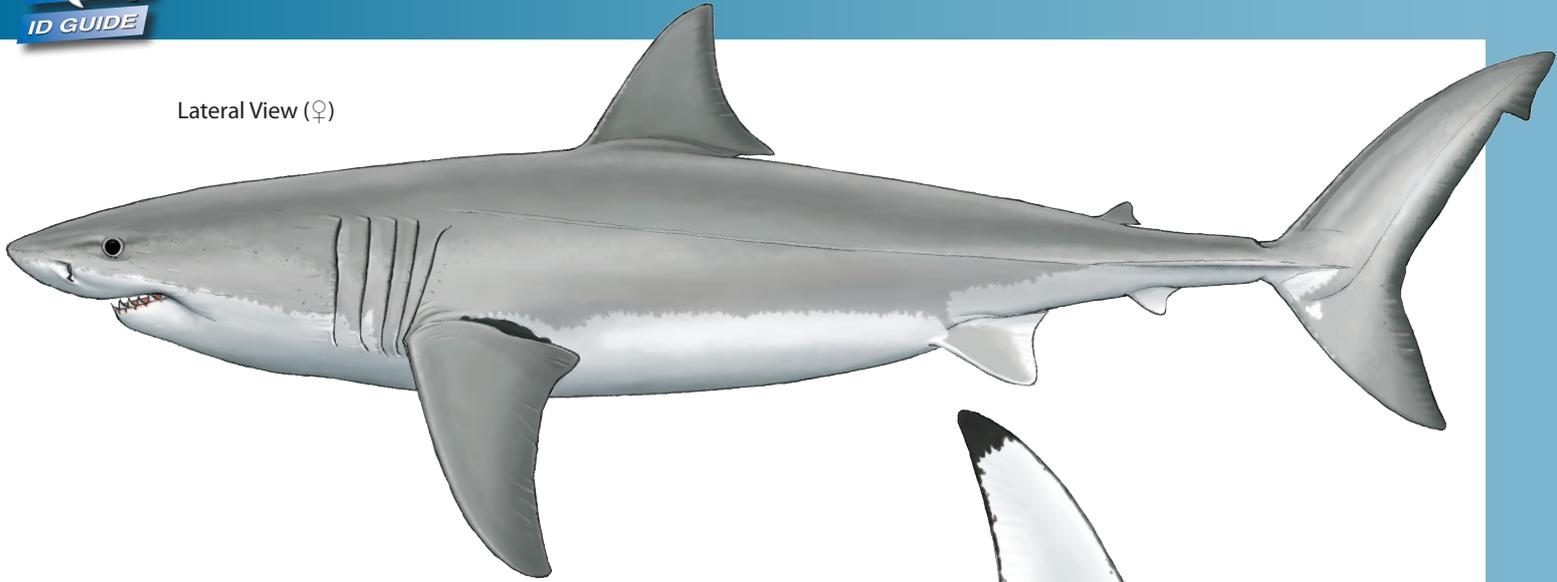
## HANDLING

- Handle with care.
- Well developed dorsal spines.
- Sharp teeth.
- Abrasive skin.

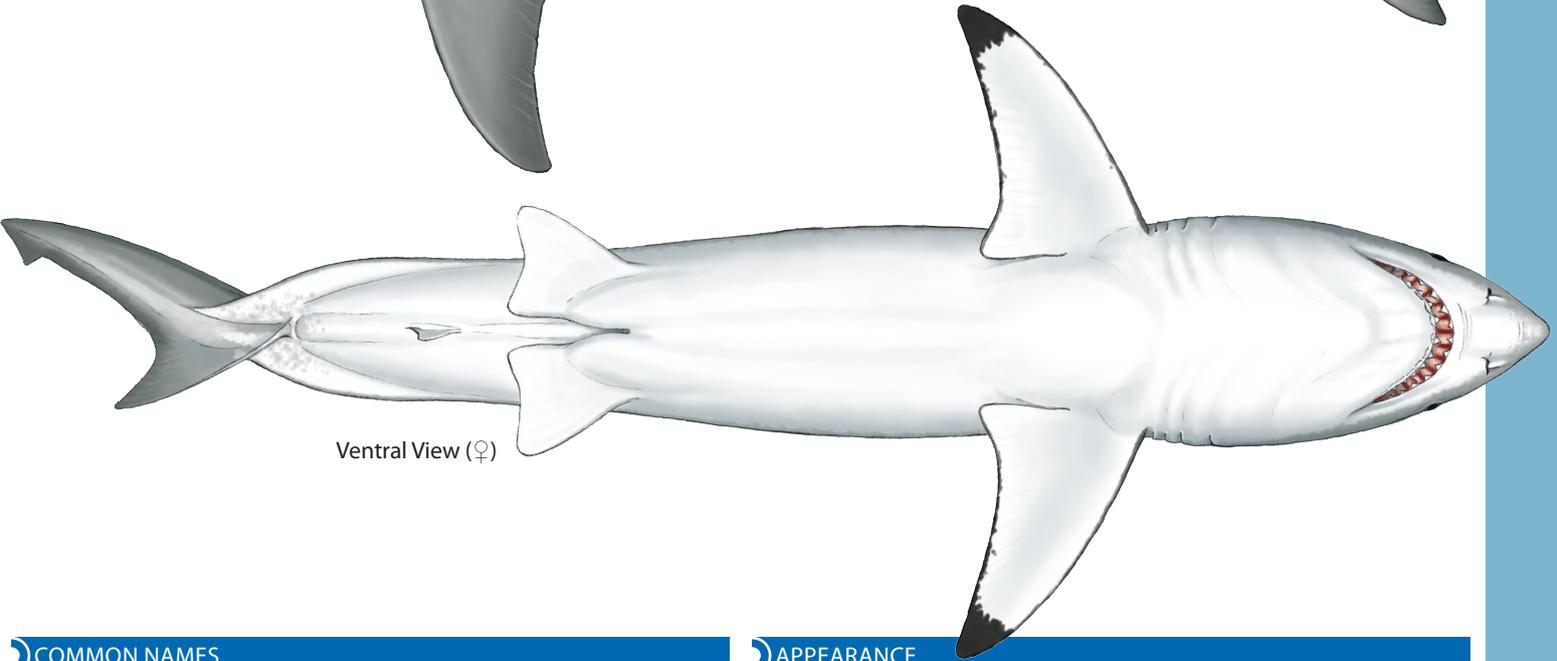
## REFERENCES

- Coelho, R. *et al*; 2008. IUCN Red List.
- Compagno, L. J. V; 1984. FAO.
- Cortés, E; 1999. *ICES JMS*.

Lateral View (♀)



Ventral View (♀)



## COMMON NAMES

**White Shark**, Great White Shark, White Pointer, White Death, Man Eater, Uptail, Tommy, Jumping Shark, Mudshark, Grand Requin Blanc (Fr), Jaquetón Blanco (Es).

## SYNONYMS

*Squalus carcharias* (Linnaeus, 1758), *Carcharias lamia* (Rafinesque, 1810), *Squalus (Carcharhinus) lamia* (Blainville, 1825), *Carcharias verus* (Cloquet, 1817), *Carcharias rondeletti* (Bory de Saint-Vincent, 1829), *Squalus (Carcharias) vulgaris* (Richardson, 1836), *Carcharodon smithii* (Müller & Henle, 1838), *Carcharodon rondeletii* (Müller & Henle, 1839).

## DISTRIBUTION



The White Shark is a wide ranging species found worldwide in temperate and tropical seas. In the east Atlantic it is known from the Bay of Biscay to South Africa, including the Mediterranean. It is possibly found around the UK but this has not been confirmed (Compagno, 2001).

## APPEARANCE

- Moderately long, conical snout.
- Long gill slits.
- Large first dorsal fin with dark free rear tip.
- Minute second dorsal and anal fins.
- Strong lateral caudal keels, no secondary keels.
- Crescent-shaped caudal fin.
- Dark grey, brown grey or blackish dorsally.
- White ventrally.
- Distinct line between colours.
- Huge, flat, triangular, serrated teeth.

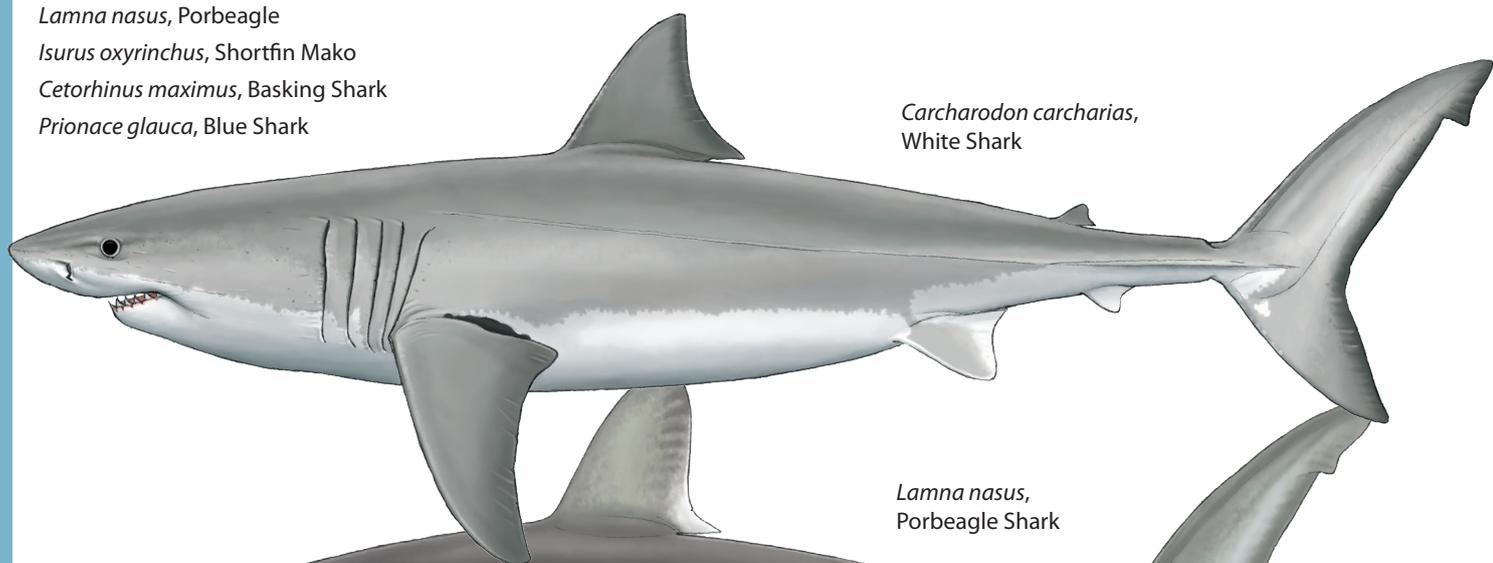
The White Shark is a huge, bulky shark with a moderately long, conical snout and long gill slits. The first dorsal fin is large with a dark free rear tip, the second dorsal and anal fins are minute. There are strong lateral keels with no secondary keels on the caudal peduncle. The caudal fin is crescent shaped with almost equally sized lobes. The teeth are distinctively triangular and flat with serrated edges. Dorsal colouration is dark grey to brown-grey or blackish with a distinct line between this and the white ventral surface. The upper surface of the pectoral fins is dark, standing out from the white of the lower flanks (Compagno, 2001).



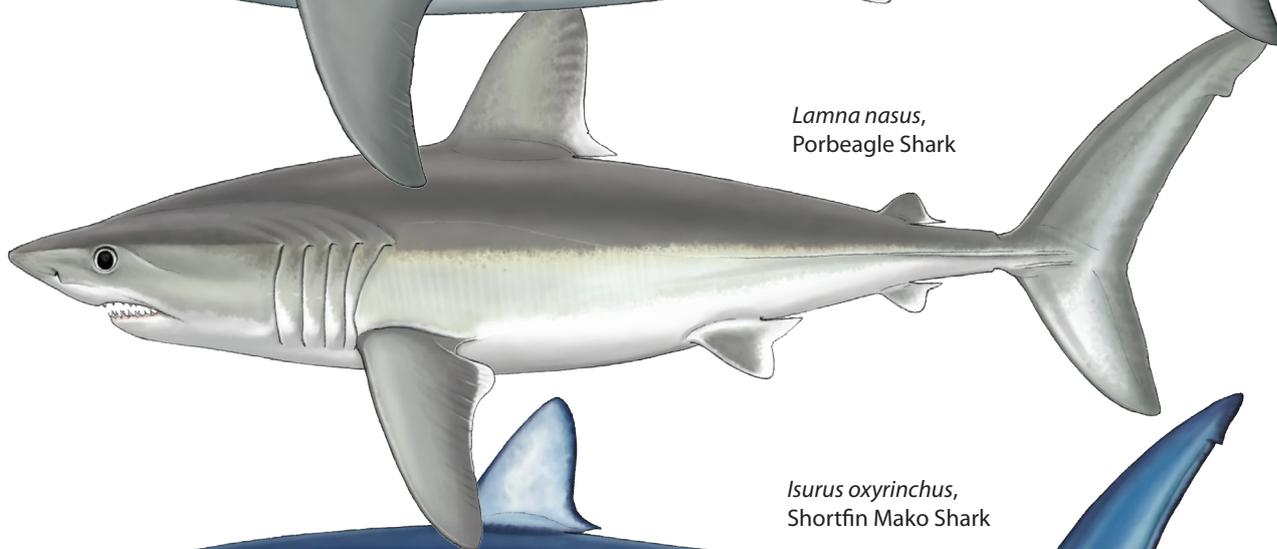
## SIMILAR SPECIES

- Lamna nasus*, Porbeagle
- Isurus oxyrinchus*, Shortfin Mako
- Cetorhinus maximus*, Basking Shark
- Prionace glauca*, Blue Shark

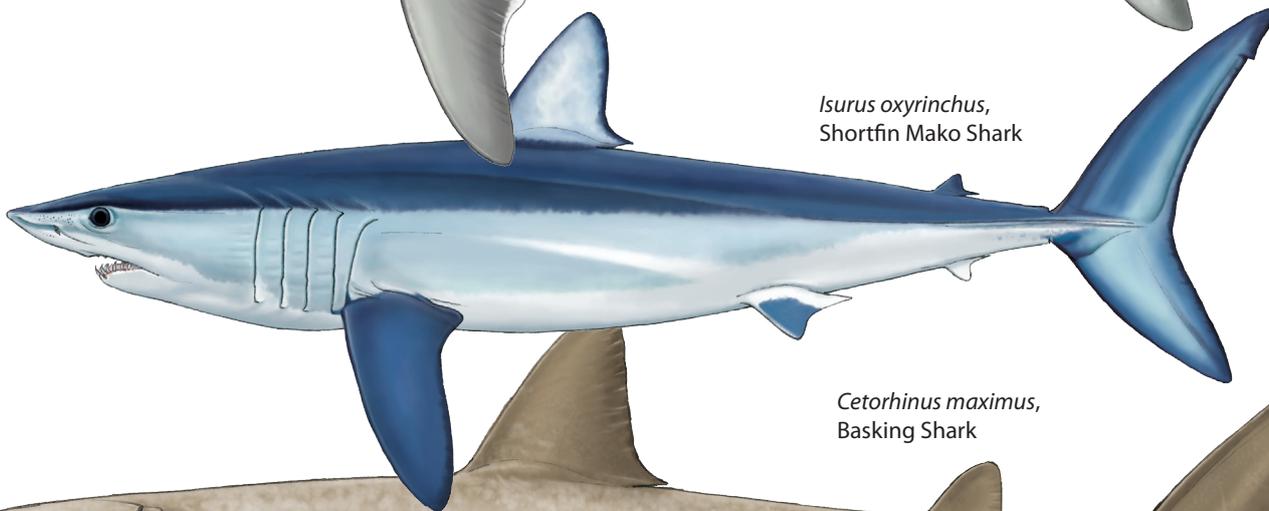
*Carcharodon carcharias*,  
White Shark



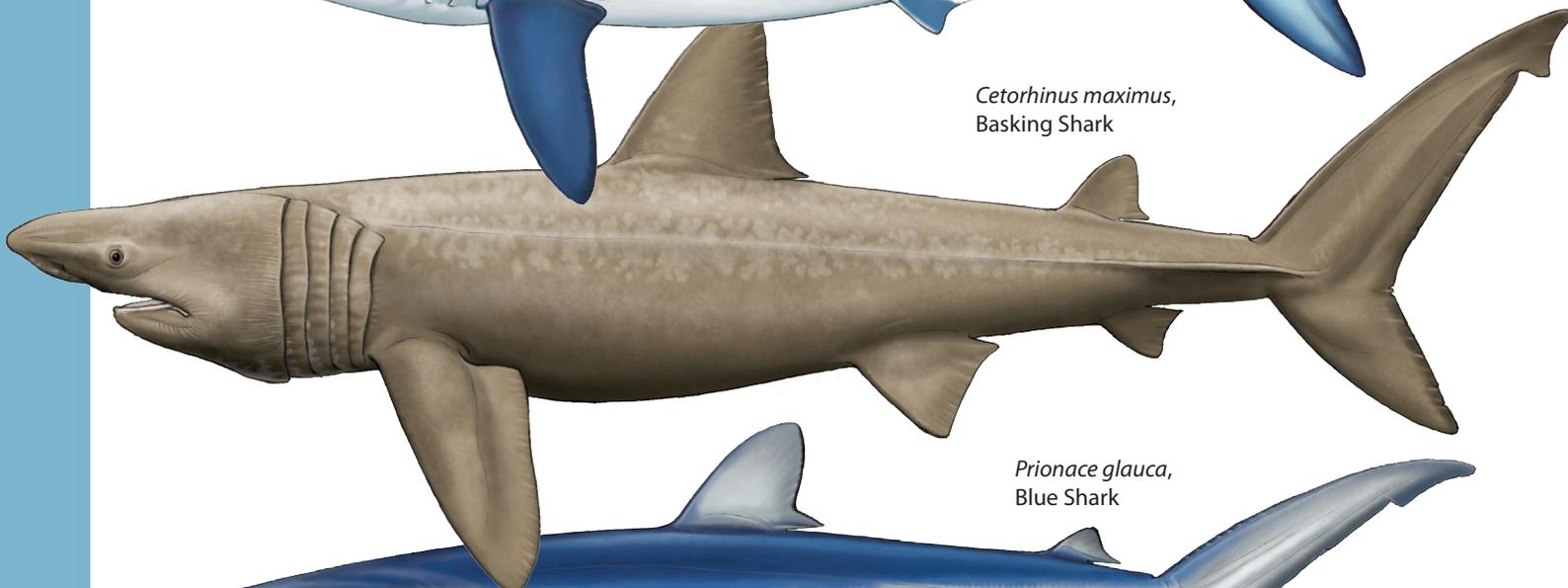
*Lamna nasus*,  
Porbeagle Shark



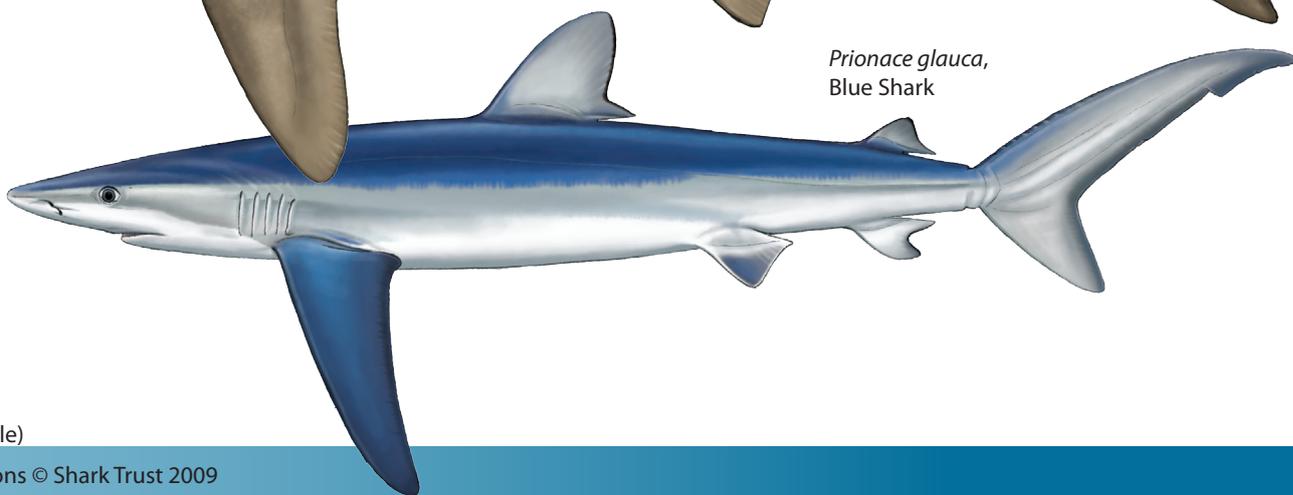
*Isurus oxyrinchus*,  
Shortfin Mako Shark



*Cetorhinus maximus*,  
Basking Shark



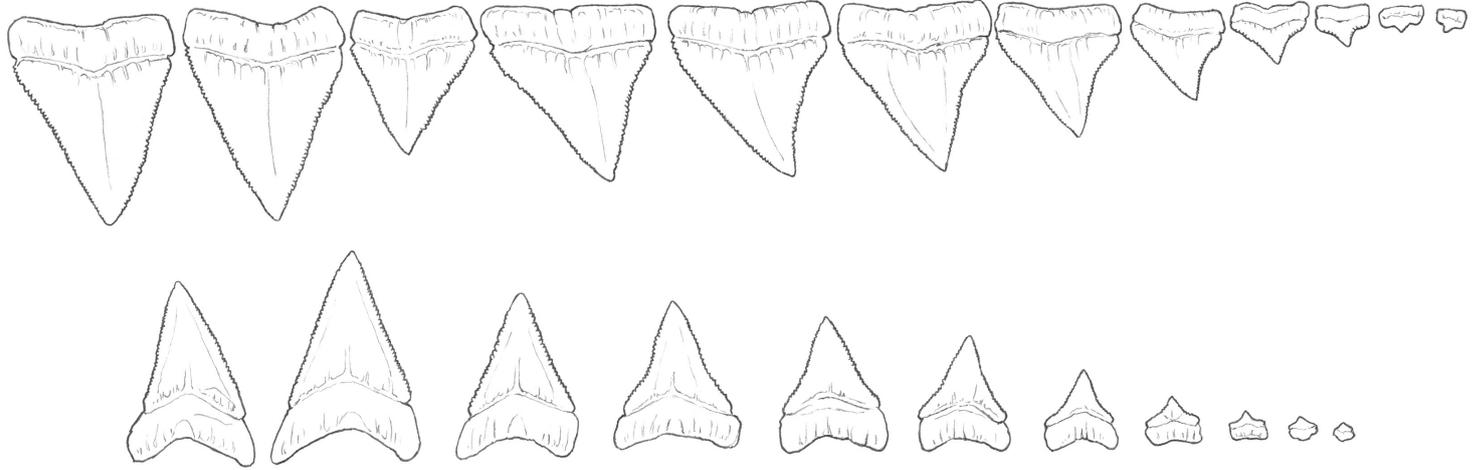
*Prionace glauca*,  
Blue Shark



(Not to scale)

### TEETH

The teeth are huge, flat, triangular and serrated in both jaws. At any one time there are 44–52 in total. These broaden as the animal grows allowing larger, mammalian prey to be taken (Compagno, 1984).



### ECOLOGY AND BIOLOGY

#### HABITAT

The White Shark is primarily a coastal and offshore species around continental and insular slopes. It is a highly migratory species known to travel across oceanic basins and well into the tropics. It often comes close to the shoreline and has been found in shallow bays and estuaries, although it is not known to enter freshwater. It can be found from the surface to the bottom in epicontinental waters and occasionally ranges down the continental slope to at least 1,875m (Fergusson *et al.*, 2000; Martins and Knickle, Unknown).

Like other Lamnid sharks, the White Shark has a 'rete mirabile' system that allows it to maintain its body temperature above that of the surrounding water (Martin, 1992). This is a rare trait among fishes, only the mackerel sharks (Lamnidae), tunas (Thunnini) and billfishes (Xiphiidae, Istiophoridae) having evolved this ability (Weng and Block, 2004). This adaptation allows the shark to range much further into the temperate regions than cold-blooded species and explains its relative abundance along the Atlantic coasts of Europe and the US (Martin, 1992). It seems to have a preference for sea surface temperatures of 15–22°C but has been recorded from 7–27°C (Martin, Unknown).

#### DIET

The White Shark is primarily a piscivore although it will take almost any prey, including carrion. Prey groups reported include cetaceans, pinnipeds, sea birds, marine reptiles, chondrichthyans, teleosts, echinoderms, crustaceans, molluscs, plants and algae. For a full report of the food items described for the species, see Martin (2003) (Martin, 2003).

#### REPRODUCTION

Female White Sharks reach sexual maturity between 400 and 500cm total length, males between 350 and 410cm. It is an ovoviparous species with the embryos nourished through oophagy, feeding on unfertilised eggs produced by the mother (Compagno, 2001). Whilst in the uterus, embryos swallow the teeth they shed, possibly as a means of conserving calcium (Martins and Knickle, Unknown). The gestation period is unknown but could be 12 months or more, reproduction is possibly biennial. Litter sizes vary from two to possibly 14 young with the pups measuring 120–150cm at birth (Compagno, 2001).

#### EGGCASE

N/A

## COMMERCIAL IMPORTANCE

Mainly a bycatch species, the White Shark is of limited commercial importance for traditional bulk products such as meat and liver oil. However, its jaws, teeth and fins are extremely valuable so it is targeted across its range by commercial and recreational fishermen (Compagno, 2001). Cage diving where the White Shark is relatively abundant is an expanding industry, generating a significant amount of money from sustainable use of the sharks (Martin, 2003).

## THREATS, CONSERVATION, LEGISLATION

The White Shark is taken as bycatch and targeted using longlines, specialised heavy line gear, rod and reel, fixed bottom gillnets, floating inshore gillnets, pelagic gillnets, fish traps, herring weirs, trammel nets, harpoons, bottom and pelagic trawls and purse seines (Compagno, 2001). Its jaws, teeth and fins are highly valuable and its meat can be fresh or preserved for human consumption. Due to its coastal habitat it is also extremely vulnerable to bather protection programmes such as beach netting. Combined with its low reproductive potential and apparently low natural abundance, it is vulnerable to anthropogenic pressures (Fergusson *et al.*, 2000).

The White Shark is protected off South Africa, the Maldives, Australia, California, the US Atlantic Seaboard and Gulf Coast and in much of the Mediterranean. Unfortunately, enforcement of this protection is weak in some areas and is of limited effectiveness for such a migratory species (Martin, Unknown; Fergusson *et al.*, 2000).

## IUCN RED LIST ASSESSMENT

Vulnerable (2000).

## HANDLING AND THORN ARRANGEMENT

- Handle with care.
- Sharp teeth.
- Abrasive skin.

## REFERENCES

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Text: Richard Hurst.

Illustrations: Marc Dando.

### Citation

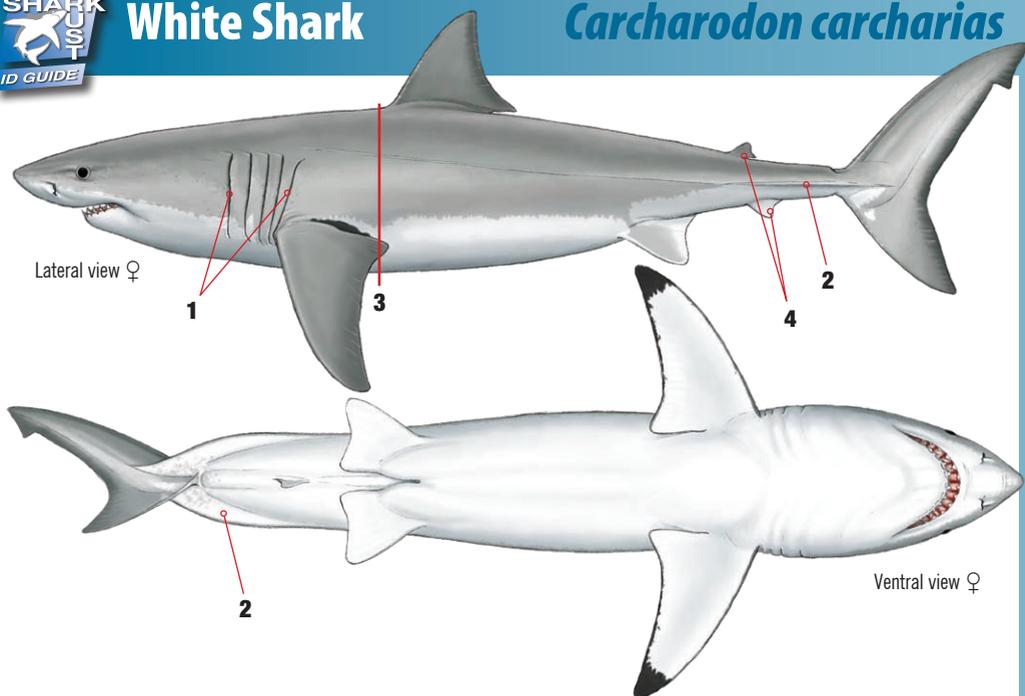
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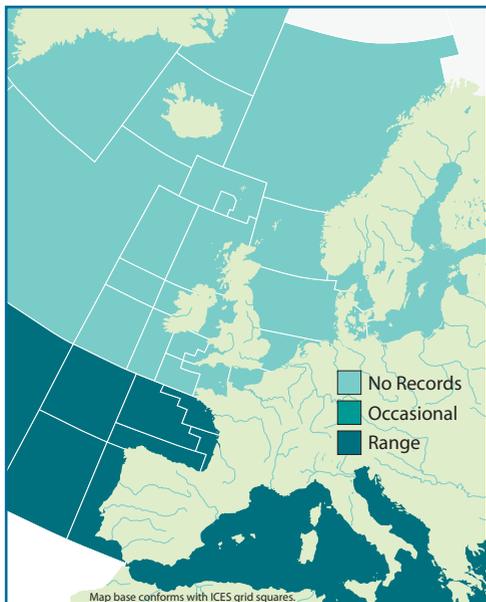


## SCIENTIFIC NAME

*Carcharodon carcharias* (Linnaeus, 1758).

## DISTRIBUTION

Circumglobal in temperate waters, larger specimens may be found in tropics. East Atlantic from Bay of Biscay to South Africa, including the Mediterranean Sea<sup>1</sup>.



## COMMON NAME

**WHITE SHARK**, Great White Shark, White Pointer, White Death, Man Eater, Grand Requin Blanc (Fr), Jaquetón Blanco (Es).

## IDENTIFICATION

- 1 Long gill slits.
- 2 Single, powerful keels on caudal fin.
- 3 Large first dorsal fin originates over pectoral inner margins.
- 4 Minute second dorsal and anal fins<sup>1</sup>.

## COLOUR

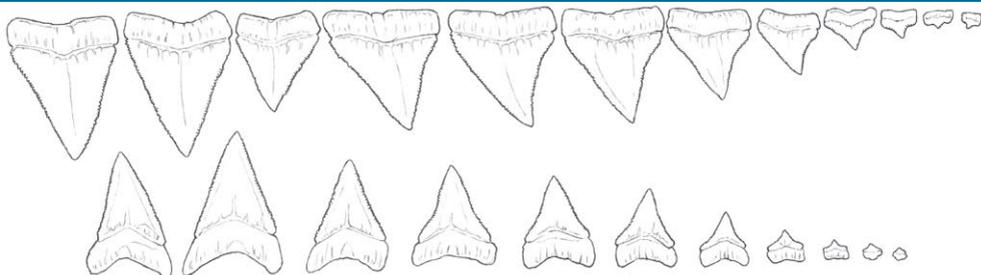
- Greyish brown to nearly black dorsally.
- White ventrally with clear demarcation on flank.
- Ventral tip of pectoral fins dark.
- Dark spot at pectoral fin base in some individuals<sup>iii</sup>.

## BIOLOGY AND SIZE

- Born: 110–160cm. Mature: 450–500cm ♀, 350–400cm ♂. Max TL: ~600cm<sup>i</sup>.
- Biennial reproductive cycle. Gestation period at least 12 months, possibly longer. Litters of 2–10 pups.
- Known to feed on an incredible variety of prey from cetaceans to marine snails, including carrion<sup>iii</sup>.



## TEETH



- Huge, flat, triangular and serrated teeth in both jaws.
- 44–52 in total.
- Broaden as the animal grows, possibly allowing larger, mammalian prey to be taken<sup>i</sup>.

## SIMILAR SPECIES



○ *Carcharodon carcharias*,  
**White Shark**



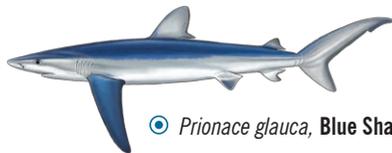
○ *Lamna nasus*, **Porbeagle Shark**



○ *Isurus oxyrinchus*,  
**Shortfin Mako Shark**



○ *Cetorhinus maximus*,  
**Basking Shark**



○ *Prionace glauca*, **Blue Shark**

## HABITAT

- Primarily a coastal species from the surface to 250m, although it ranges into the open ocean and has been recorded to 1,280m
- Seems to prefer rocky bottoms against which it may be camouflaged from above.
- Can maintain its body temperature above that of the surrounding water allowing it to range into colder regions than most sharks<sup>i</sup>.

## CONSERVATION STATUS

- Wide but sparse distribution, low reproductive potential and vulnerability to fisheries mean populations are at risk of declining significantly<sup>ii</sup>.
- **Red List status:** Vulnerable (2005).

## COMMERCIAL IMPORTANCE

- Meat is sometimes utilised for human consumption fresh or preserved. The liver oil can be extracted for vitamins.
- The jaws and teeth are valuable for the curio trade and the fins are prized in East Asia for sharkfin soup<sup>ii</sup>.
- Cage diving with White Sharks is popular and can generate significant wealth in local communities<sup>iii</sup>.
- Prohibition on commercial fishers retaining this species in EU waters.

## HANDLING

- Handle with care.
- Large, powerful shark.
- Sharp teeth and abrasive skin.

## REFERENCES

- i. Compagno, L. J. V. *et al.*; 2005. HarperCollins Publishers.
- ii. Fergusson, I. *et al.*; 2005. IUCN Red List.
- iii. Martin, R. A.; 2003. ReefQuest Centre for Shark Research.