

CITES SHARKS AND RAYS

Implementing and enforcing listings -- VOLUME I

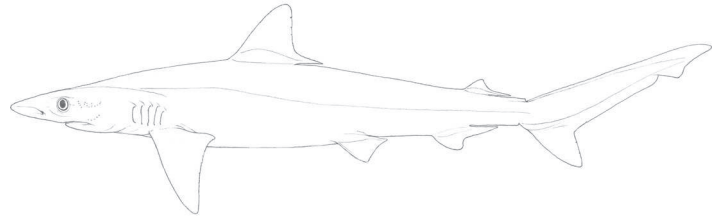


FULL CARCASS ID

CITES SHARKS AND RAYS

Implementing and enforcing listings -- VOLUME I

FULL CARCASS ID



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WHY THIS GUIDE?

Background

Over the last decade, an increasing number of shark and ray species have been listed in the Appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) due to concerns over population declines associated with increased fishing pressure in industrial and artisanal fisheries. These commercially important sharks and rays are harvested in significant numbers each year for their fins, meat, and gill plates (for mantas and devil rays, family Mobulidae). These derivative products are among the most valuable seafood products traded in international markets, and monitoring and enforcement are crucial to ensuring this trade is legal, sustainable, and traceable.

Since 2014, approximately 60 regional and domestic shark and ray workshops have taken place globally to assist with the implementation of CITES listings. With the support of governments, non-governmental organizations, and other partner and funding organizations (including the CITES Secretariat, the United Nations Food and Agriculture Organization (FAO), the European Union, the Pew Charitable Trusts, and the Shark Conservation Fund), considerable progress has been made to address capacity building needs in key countries that exploit and trade in sharks and rays around the world. Because the fin trade has been the major driver in the overexploitation of CITES-listed species, field guides and other materials developed to date have focused on the international trade in shark and ray fins and gill plates. Visual identification of fins and gill plates from CITES-listed sharks and rays, coupled with advances in genetic approaches to species identification, have been effectively used to ensure CITES Parties meet their obligations under the Convention. However, notable implementation and enforcement challenges remain, including the need to address identification at landing sites or in fish markets.

In many of the world's largest shark and ray fishing nations, species-specific information on landings and product exports are lacking. Even in fisheries where sharks and rays are landed whole – with key morphological features on the head and fins intact – identification remains a challenge due to lack of identification materials and insufficient training of field staff. However, species-specific landings data are important for understanding abundance, distribution, and basic ecology.

Accurate reporting of shark and ray catches to the species level is also crucial for improving domestic and international management and conservation strategies as well as assist with traceability.

Many countries have taken salient steps to monitor landings and trade, but the noted difficulties of identifying whole carcasses to the species level hinders the implementation of various international and national management measures, particularly in the context of CITES where a significant number of listed species are harvested annually. It remains unclear in what quantities CITES-listed species, specifically silky sharks (*Carcharhinus falciformis*), hammerheads (*Sphyrna* spp.), threshers (family Alopiidae), makos (*Isurus* spp.), wedgefishes (family Rhinidae), and giant guitarfishes (family Glaucostegidae), are harvested annually.

To determine and address challenges of detecting illicit trade in CITES-listed sharks and rays, some of which are also protected domestically, the Wildlife Conservation Society (WCS) has been working in countries to support the implementation of CITES listings. In collaboration with the Centre for Environment, Fisheries and Aquaculture Science (Cefas), and the University of Salford (United Kingdom) through a project funded by the Illegal Wildlife Trade Challenge Fund, materials for the identification of sharks, rays, and their derivative products are being developed. This is in response to key personnel responsible for fisheries and trade inspections having underscored that identifying whole carcasses can sometimes pose a significant challenge in implementing fisheries controls, especially for species that are look-alikes.

Purpose of this guide

This guide forms part of a three-volume series of identification guides: Volume I – Full Carcass ID [*this guide*], Volume II – Processed Carcass ID, and Volume III – Dried Product ID. Each of these guides has been designed to follow a similar simple structure to guide users with no previous knowledge of sharks and rays with identification of whole carcasses or different derivative products.

This **Full Carcass ID** guide is intended for field use to assist the fishing industry, fisheries observers, enforcement bodies, researchers, policy makers, and non-specialists. It was created to enable visual identification of **all shark and ray species listed in Appendix I and II of CITES** that might be captured and/or landed and eventually enter the trade. It has

been designed to meet the need expressed by inspectors for an identification tool that is quick and easy to use when faced with the identification of carcasses present at landing sites. Technical terms are kept to a minimum and identification features are mostly those that can be readily observed on freshly caught animals without the need for dissection or further examination.

Note on potential limitations for using this field guide: This guide provides a general reference for the identification of full carcasses for all shark and ray species listed in Appendix I and II of CITES at the time of publication. However, it is important to note that the taxonomic status and naming of species, the IUCN Red List of Threatened Species statuses, and information on the distribution and sizes of species are likely to change after publication based on new scientific information. This guide is therefore not the sole definitive source for taxonomic or species status. The IUCN Red List as well as peer-reviewed publications should be consulted periodically for updates on species.

How to use this guide

This guide is designed to aid fisheries or trade inspectors in accurately identifying a full carcass to the species level. Several keys in the form of flowcharts are provided so that a shark or ray can be systematically identified to its appropriate family grouping and then to the relevant page. Species accounts do not follow taxonomic sequence but rather the key identifying features that allow to differentiate them. Therefore, the first step for users is to refer to the flow charts on pages 16 and 17. These flow charts are set up to ask a series of statements consisting of two choices, either **Yes** or **No**, that describe key characteristics that are seen on whole carcasses. These features can be used to quickly and easily distinguish species listed on CITES Appendix I and II from species not listed during routine inspections. Within these flowcharts, any species groupings referring to species not listed on CITES are noted with a red hand () (). The user begins the identification process based on whether they are trying to identify a shark or a ray by determining the shape of the body and the position of the gills. Each major grouping (Order) of sharks and rays is color coded and, within each of these sections, species are arranged alphabetically by scientific name, i.e., by genus name then by species name.

Each species page in this guide contains detailed information in relation to each species including:

- The English common name, scientific name (binomial name: genus and species), and species authority (the name of author(s) who named it and the year in which it was named). These follow those adopted by Ebert et al. (2021) for sharks, Last et al. (2016) for rays, and the most current IUCN Red List assessments (www.iucnredlist.org). Parentheses around the author(s) and date indicate that the species was originally placed in a different genus.

- The IUCN Red List status of each species (data extracted in July 2021). Species are assigned to one of eight categories: EX - Extinct, EW - Extinct in the Wild, Critically Endangered (CR), Endangered (EN), Vulnerable (VU), NT - Near Threatened, LC - Least Concern, DD - Data Deficient. Those assessed as CR, EN, or VU are considered threatened. The color of each symbol used follows the standard colors for each category as defined by the IUCN Red List and as seen below.



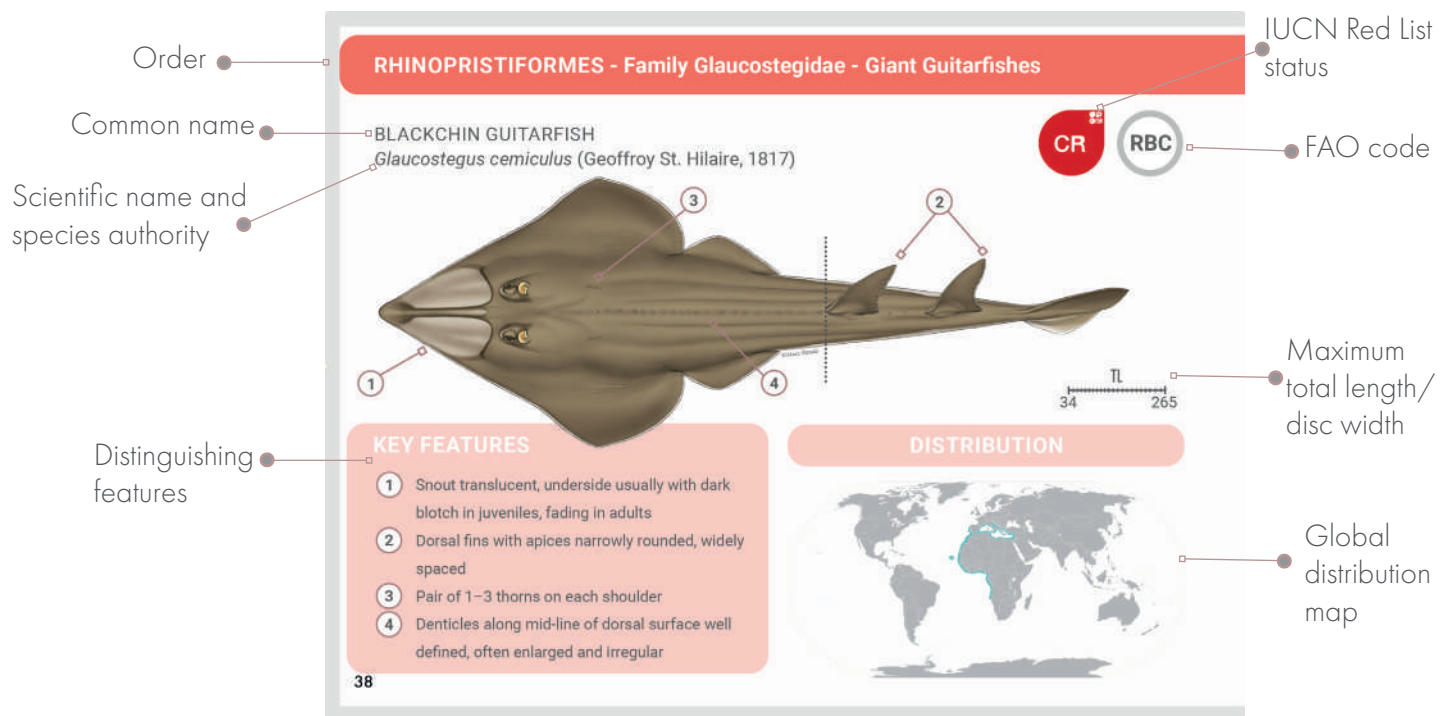
- A three letter identification code which is the official FAO code unique to each species. For some species, an FAO code has yet to be assigned and the **X** sign has been used instead.

- The known average size at birth and maximum total length (TL) for sharks, wedgefishes, and giant guitarfishes, and disc width (DW) for manta and devil rays (in centimetres) (see page 13). TL is measured as a straight line from the tip of the snout to the tip of the extended upper caudal fin lobe. DW is measured as a straight line from the tip of one pectoral fin to the other tip. Readers should note that it is possible to find individuals of each species smaller or larger than the reported minimum and maximum sizes. A question mark (?) indicates that this information is currently not available.

- The key external features used to identify a species in the field. Not all distinguishing features have been provided but instead the focus was retained on features that are the most important in the field for rapid identification.

- A color illustration representing each species from a lateral (sharks) or dorsal (rays) view. The colors of live or freshly caught fish are illustrated unless otherwise specified for a certain life-stage. It is important to note that colors might differ if animals have been dead for many hours before being landed with subtle color patterns often barely detectable after death.

- A map of the known marine distribution of each species with dark green shading indicating confirmed distributions of species and light green shading indicating possible distribution. These maps reflect current knowledge but it is important to note that in some cases, they may differ from those you may find in IUCN Red List assessments. The authors have made decisions on the distribution of species based on updated information not yet published in the assessments. For example, the distribution of the Bottlenose Wedgefish (*Rhynchobatus australiae*) has not been mapped in the Arabian/Persian Gulf because new information has emerged indicating it does not occur in this body of water. For sawfishes (family Pristidae), areas where they have reportedly been extirpated have not been included. Furthermore, it should be noted that some species may also occur in freshwater (e.g. Largetooth Sawfish *Pristis pristis*) and these locations are not shown.



GLOSSARY

anterior – the front, or situated towards the head.

apex – the top or highest point.

caudal peduncle – tapered region behind the anal fin where the caudal fin attaches to the body.

cephalic fin – broad lobe on forehead of some rays.

clasper – a pair of reproductive appendages located behind the pelvic fins of a male shark or ray.

convex – arched, curved outwards (opposite of concave).

dorsal – relating to the upper part or surface of back.

denticle – a small, tooth-like structure on the skin; placoid scale of a cartilaginous fish.

falciform – curved like a sickle; hooked.

fin insertion – point of attachment of the fin to the shark body, located along the rear edge.

free rear tip – posterior tip of a fin that is not attached to the body, located closest to the fin insertion.

interdorsal – space on dorsal surface between first and second dorsal fin.

interdorsal ridge – ridge of skin between first dorsal and second dorsal fin.

laterally compressed – flattened from side to side.

lateral keels – fleshy ridges on the sides of the body.

lobe – rounded outgrowth, projection of a body part.

lunate – shaped like a crescent moon.

margin – edge or border of the body or fin.

nasal flap – dermal flap associated with the nostrils.

nictitating eyelid – movable eyelid that can lift and completely close the eye opening.

posterior – the back, or situated behind or at the rear.

precaudal – situated before the tail or caudal fin.

rostral teeth – tooth-like projections on the side of the snout of sawfishes.

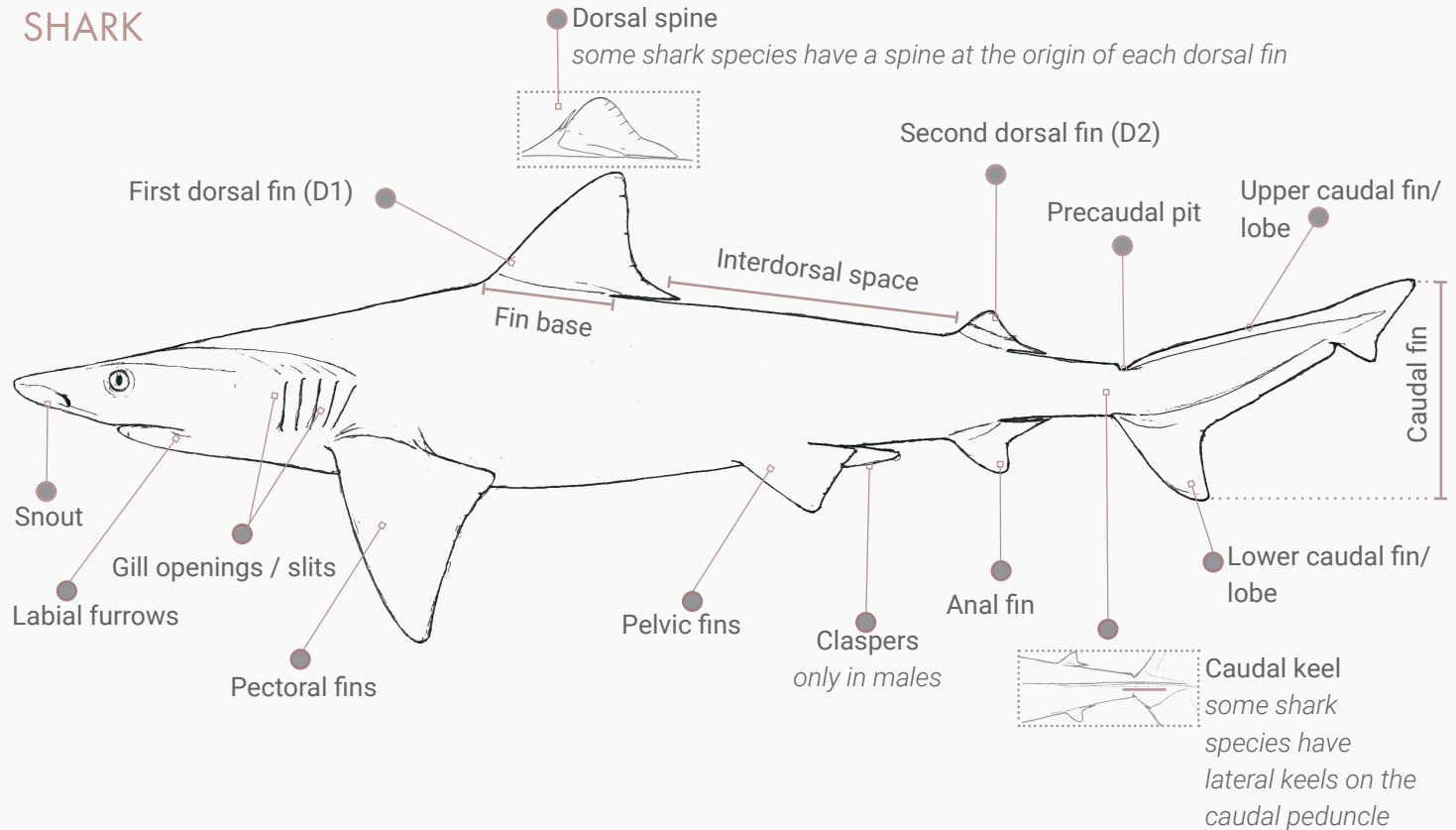
rostrum – a projecting snout.

spiracle – opening behind the eye used for maintaining a flow of oxygenated water over the gills when the mouth is closed.

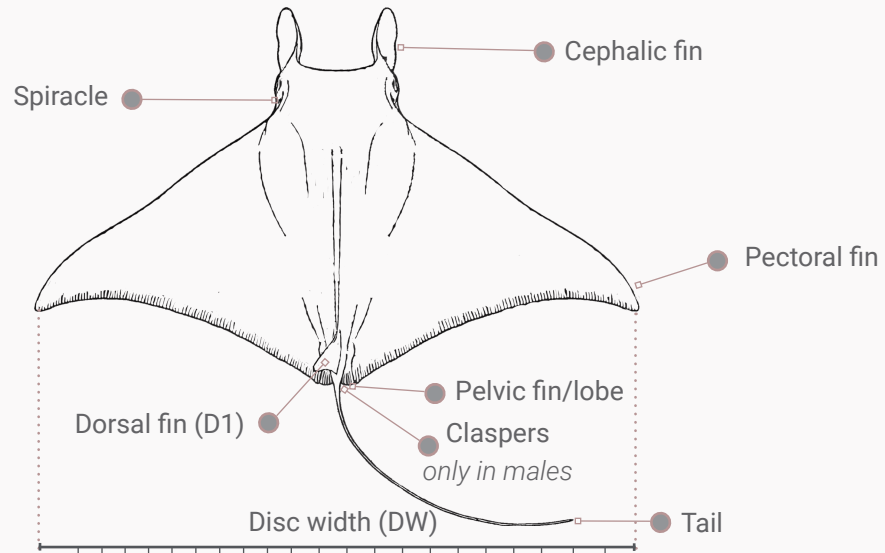
ANATOMY

The following lateral view illustrations of sharks, rays, and rhinopristids (Order Rhinopristiformes) highlight the external terminology used in this guide to describe key features used in the identification of full carcasses.

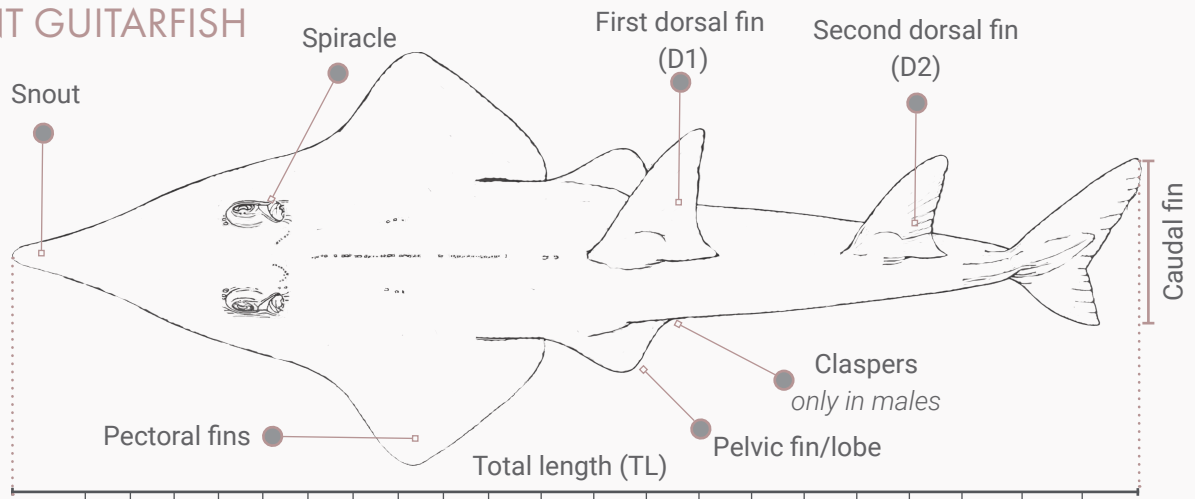
SHARK



RAY

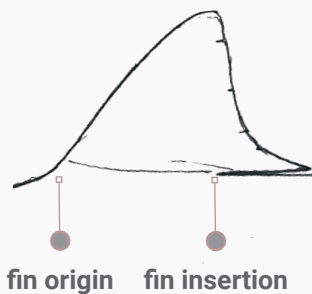


WEDGEFISH/ GIANT GUITARFISH

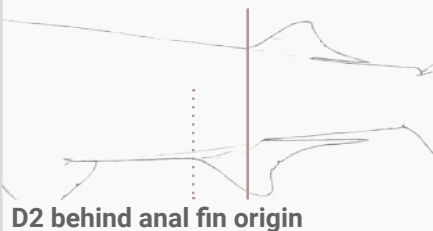
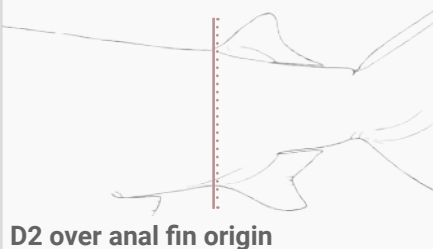
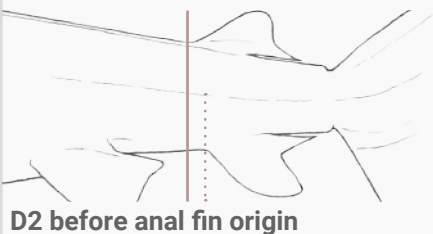


FIN POSITIONS AND SHAPES

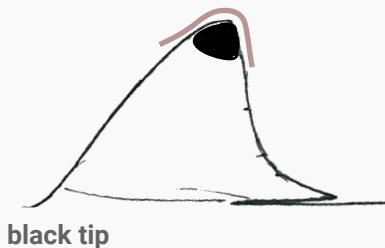
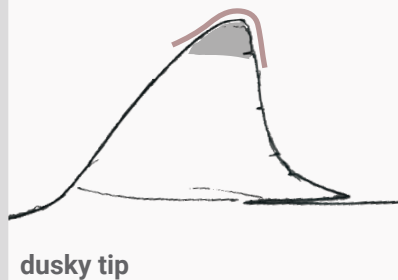
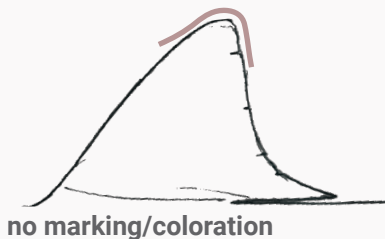
Dorsal fins



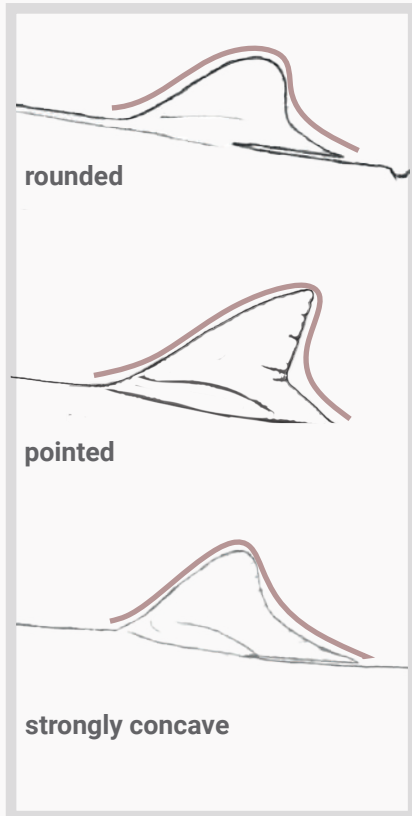
Second dorsal and anal fin positions



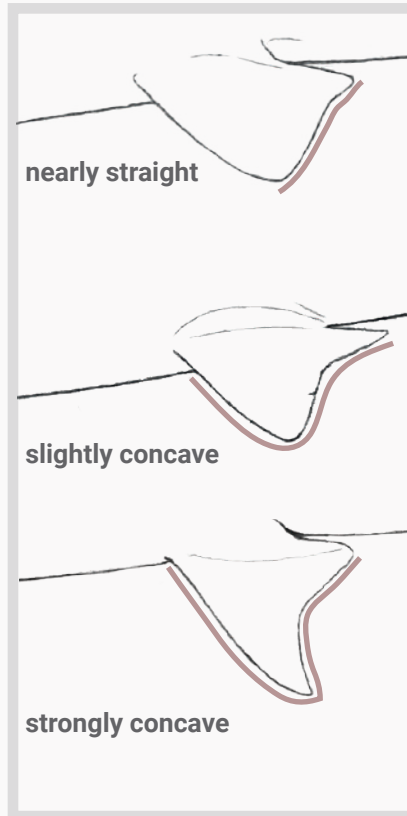
Fin coloration



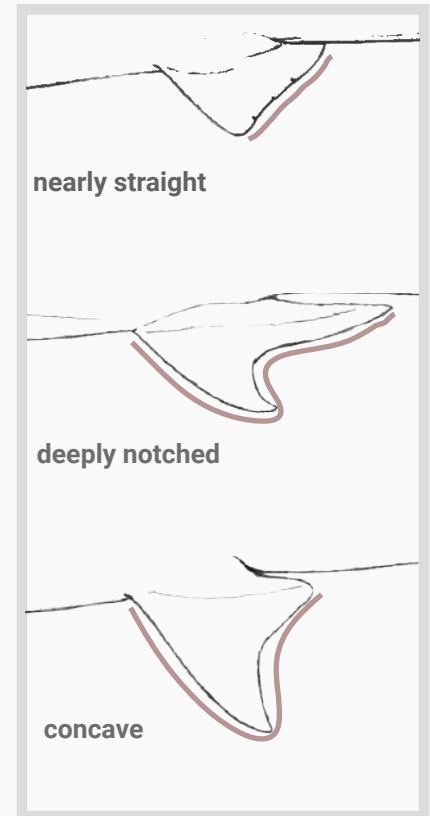
Second dorsal fin apex



Pelvic fins

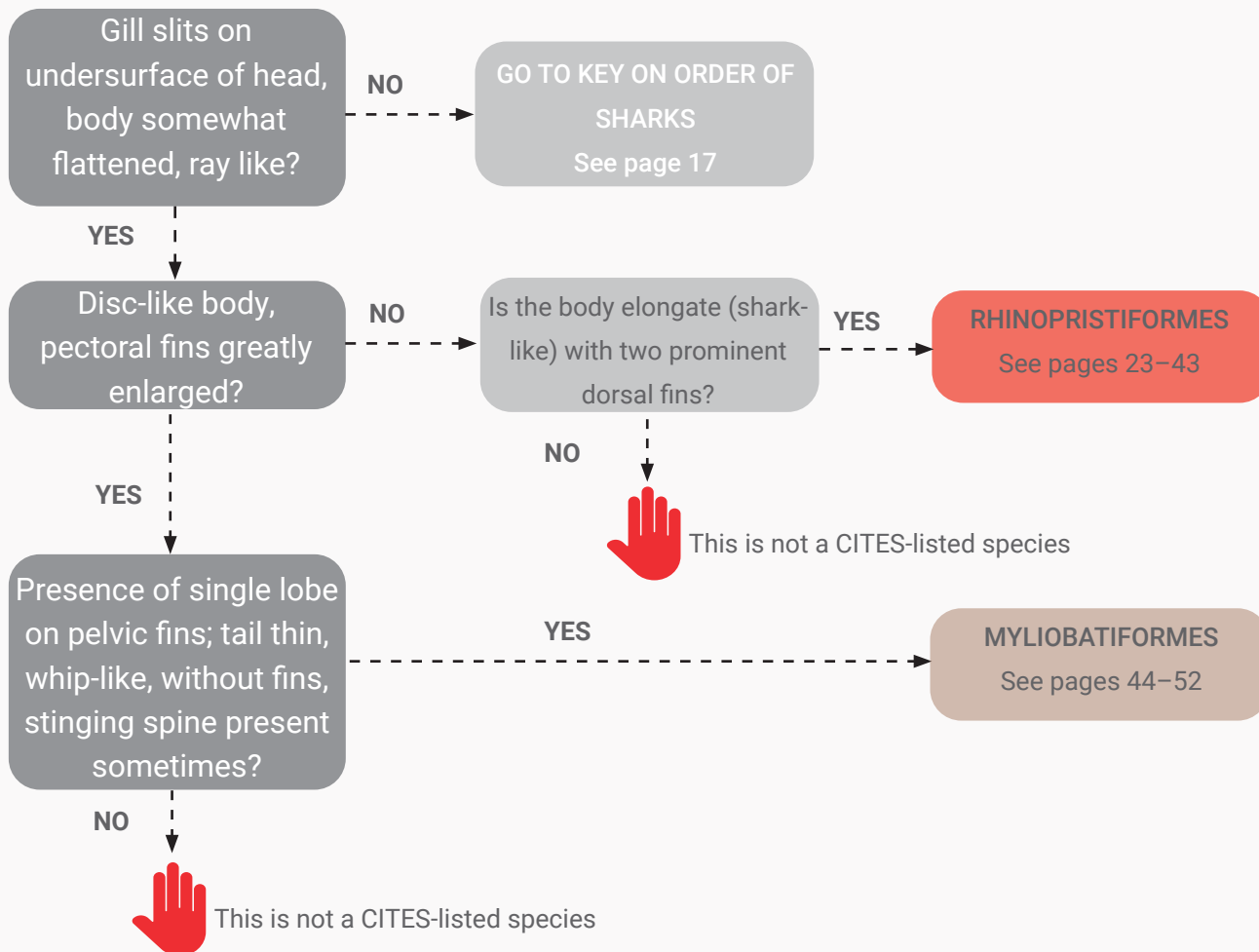


Anal fins



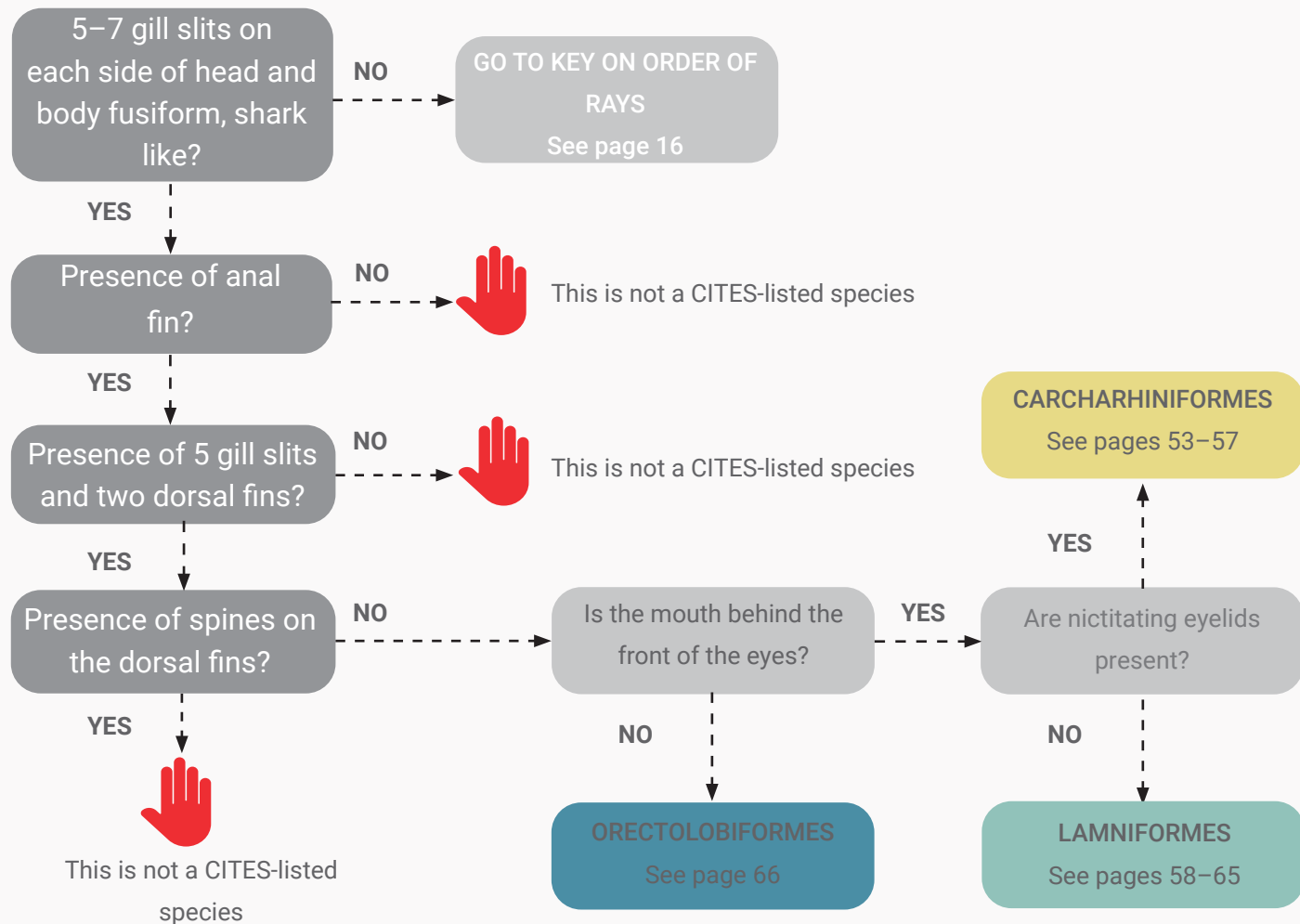
START

KEY TO ORDER OF RAYS



START

KEY TO ORDER OF SHARKS



Key to families of the Order Rhinopristiformes

RHINOPRISTIFORMES

Snout elongated, flattened with saw-like blade / enlarged teeth along lateral margin of rostrum



Family Pristidae
Sawfishes

Snout elongated, flattened, short to long, without saw-like blade or rostral teeth

Pectoral fins do not reach origin of pelvic fins; caudal fin with distinct, well developed lower lobe; D1 origin over or before pelvic fins



Family Rhinidae
Wedgefishes

Pectoral fins reach origin of pelvic fins or overlap; caudal fin without a distinct lower lobe; D1 origin well behind pelvic fins

Nostrils long and narrow, anterior nasal opening rectangular; no color on body; body surface rough with thorns and large denticles



Family Glaucostegidae
Giant guitarfishes

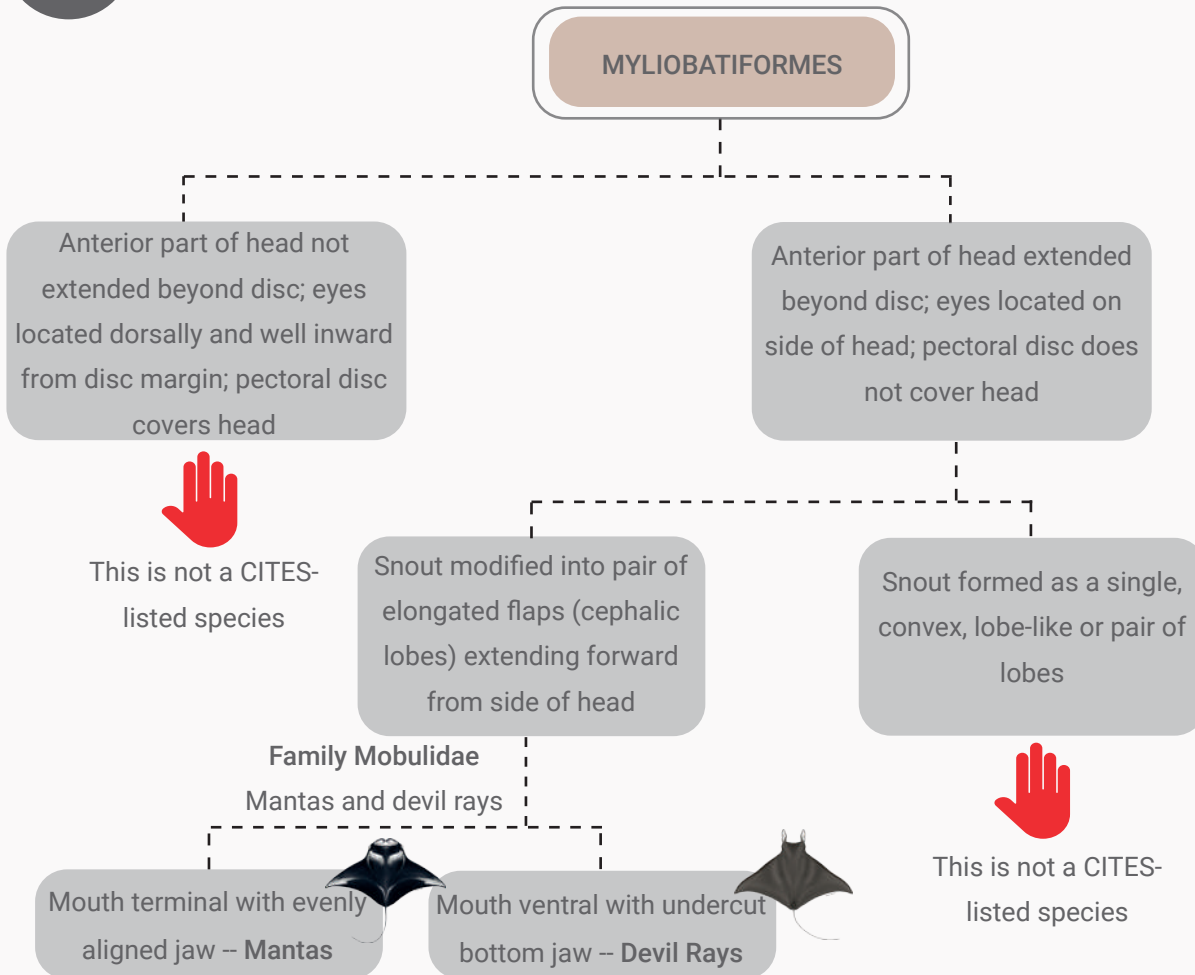
Nostrils not greatly elongate, anterior nasal opening circular or oval; often with patterns on body; body surface with fine denticles

This is not a CITES-listed species



START

Key to families of the Order Myliobatiformes



CARCHARHINIFORMES



Head with lateral expansions or hammer-shaped; pectoral fins short and broad

Family Sphyrnidae

Hammerhead sharks

Head not expanded laterally or hammer-shaped

Precaudal pit absent; dorsal caudal fin margin smooth

This is not a CITES-listed species



Posterior nasal flaps well developed

This is not a CITES-listed species

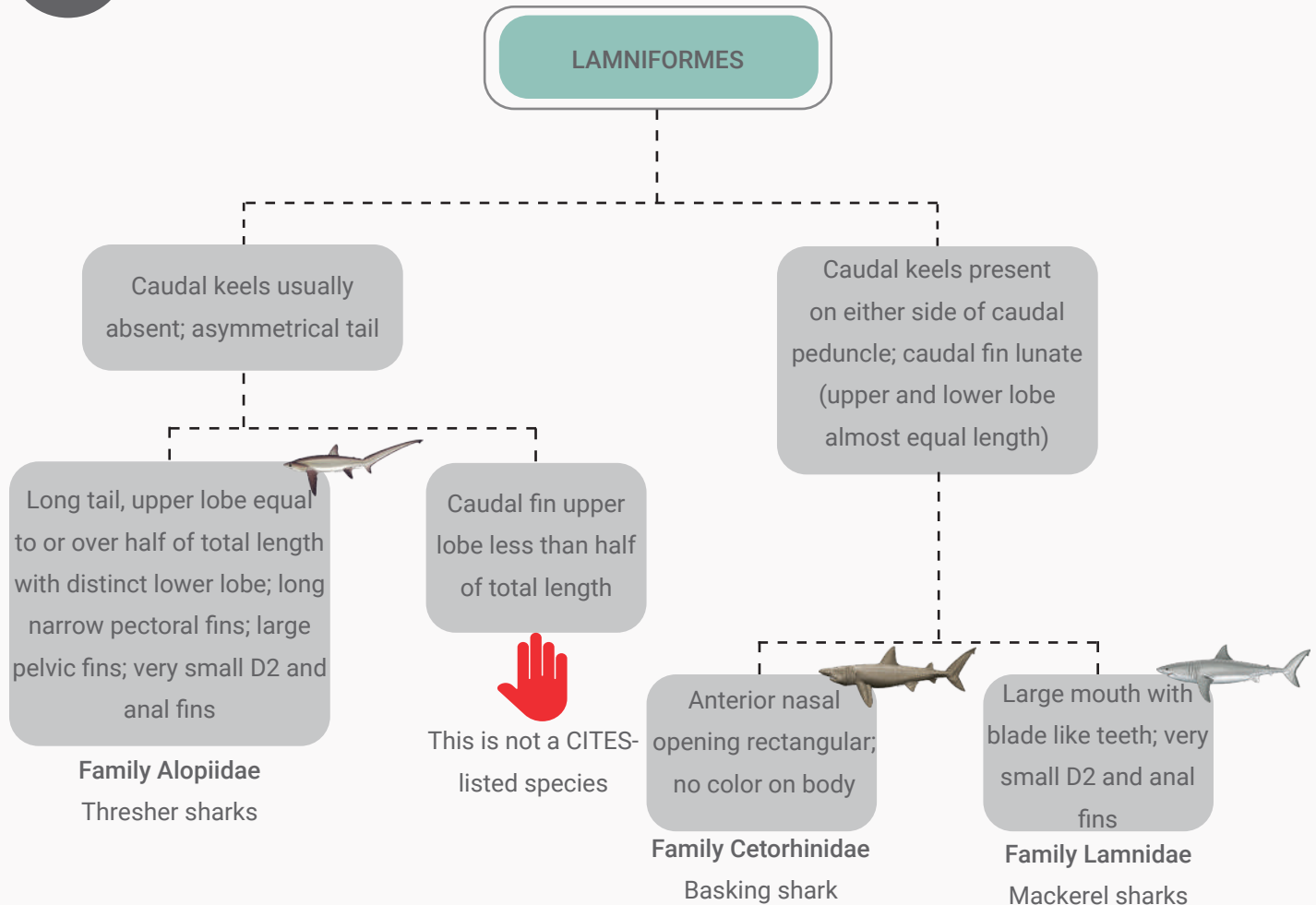


Precaudal pit present; dorsal caudal fin margin rippled



Posterior nasal flaps poorly developed

Family Carcharhinidae
Requiem sharks



START

Key to families of the Order Orectolobiformes

ORECTOLOBIFORMES



Mouth very broad and at the front of the head; caudal peduncle with lateral keels; caudal fin with well developed lower lobe

Family Rhincodontidae
Whale shark

Mouth small and subterminal; caudal fin without or with very small lower lobe



This is not a CITES-listed species

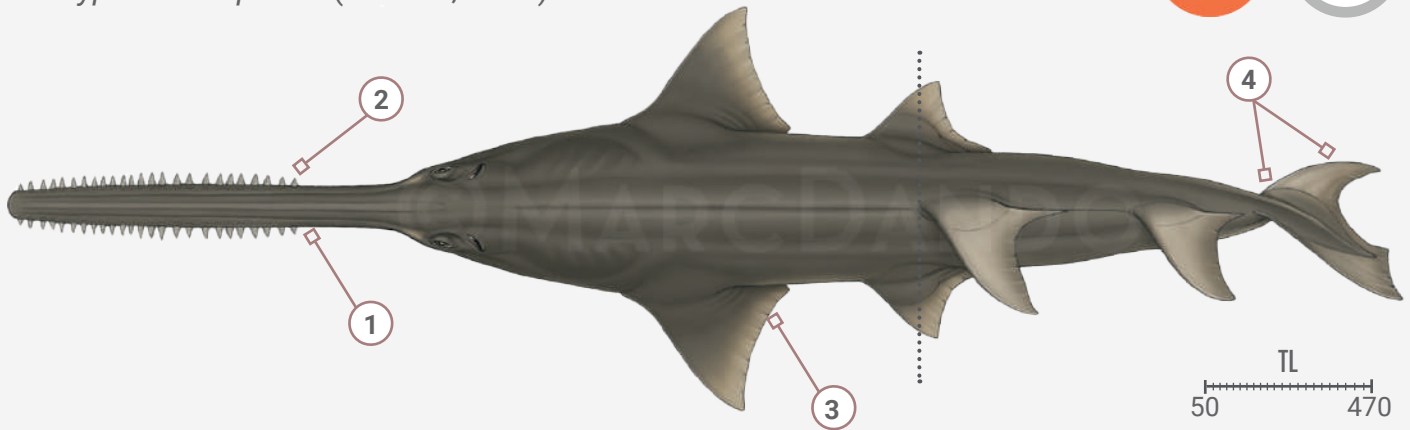
RHINOPRISTIFORMES - Family Pristidae - Sawfishes

NARROW SAWFISH

Anoxypristis cuspidata (Latham, 1794)

EN

RPA



KEY FEATURES

- 1 Rostrum long and narrow, teeth absent from base, tooth gaps unevenly spaced
- 2 Flat, triangular teeth, total of 16–33 on each side of saw
- 3 Pectoral fins as long as they are wide
- 4 Caudal fin forked, notch on upper lobe, prominent lower lobe, two lateral keels on caudal fin base

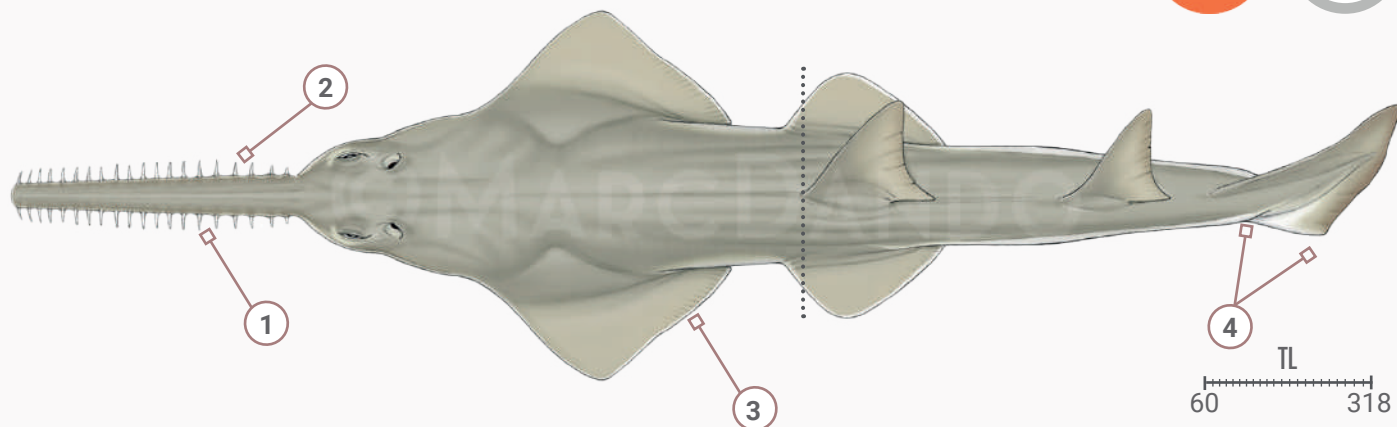
DISTRIBUTION



RHINOPRISTIFORMES - Family Pristidae - Sawfishes

DWARF SAWFISH

Pristis clavata Garman, 1906



KEY FEATURES

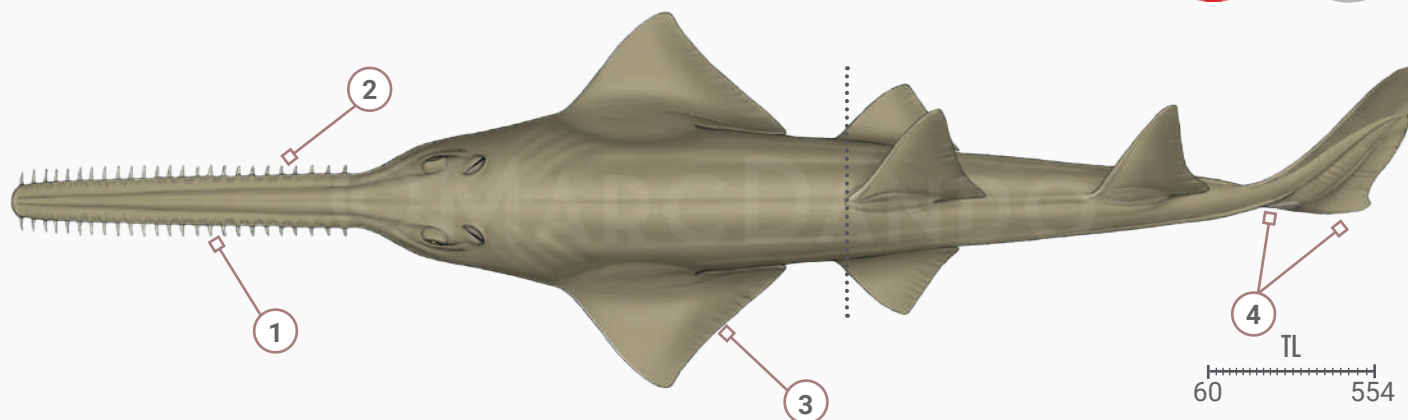
- ① Rostrum short and wide, teeth starting from base, tooth gaps evenly spaced
- ② Total of 18–27 teeth on each side of saw
- ③ Pectoral fins longer than they are wide
- ④ Caudal fin not forked with lower lobe small or absent, single large median keel on fin base

DISTRIBUTION



SMALLTOOTH SAWFISH

Pristis pectinata Latham, 1794



KEY FEATURES

- ① Rostrum long and narrow, teeth starting from base, tooth gaps larger near base than tip
- ② Total of 20–32 teeth on each side of saw
- ③ Pectoral fins longer than they are wide
- ④ Caudal fin not forked with lower lobe small or absent, single large median keel on fin base

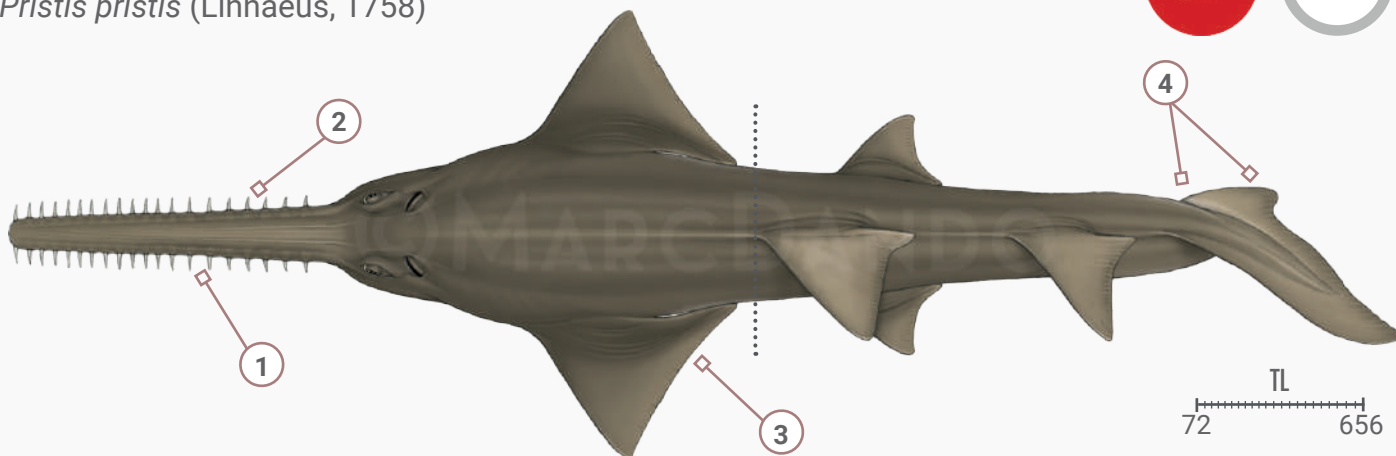
DISTRIBUTION



RHINOPRISTIFORMES - Family Pristidae - Sawfishes

LARGETOOTH SAWFISH

Pristis pristis (Linnaeus, 1758)



KEY FEATURES

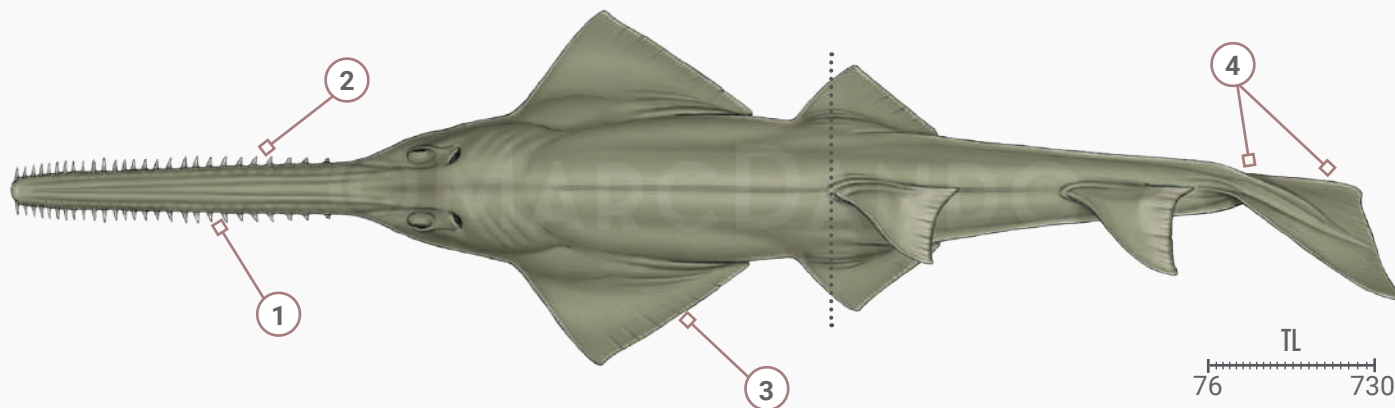
- ① Rostrum short and wide, teeth starting from base, tooth gaps evenly spaced, last tooth gap near tip bigger than preceding gap
- ② Total of 14–24 teeth on each side of saw
- ③ Pectoral fins as long as they are wide
- ④ Caudal fin forked, distinct but small lower lobe, single large median keel on base

DISTRIBUTION



GREEN SAWFISH

Pristis zijsron Bleeker, 1851



KEY FEATURES

- ① Rostrum long and narrow, teeth starting from base, tooth gaps larger near base than at tip
- ② Total of 23–37 teeth on each side of saw
- ③ Pectoral fins longer than they are wide
- ④ Caudal fin not forked with lower lobe small or absent, single large median keel on fin base

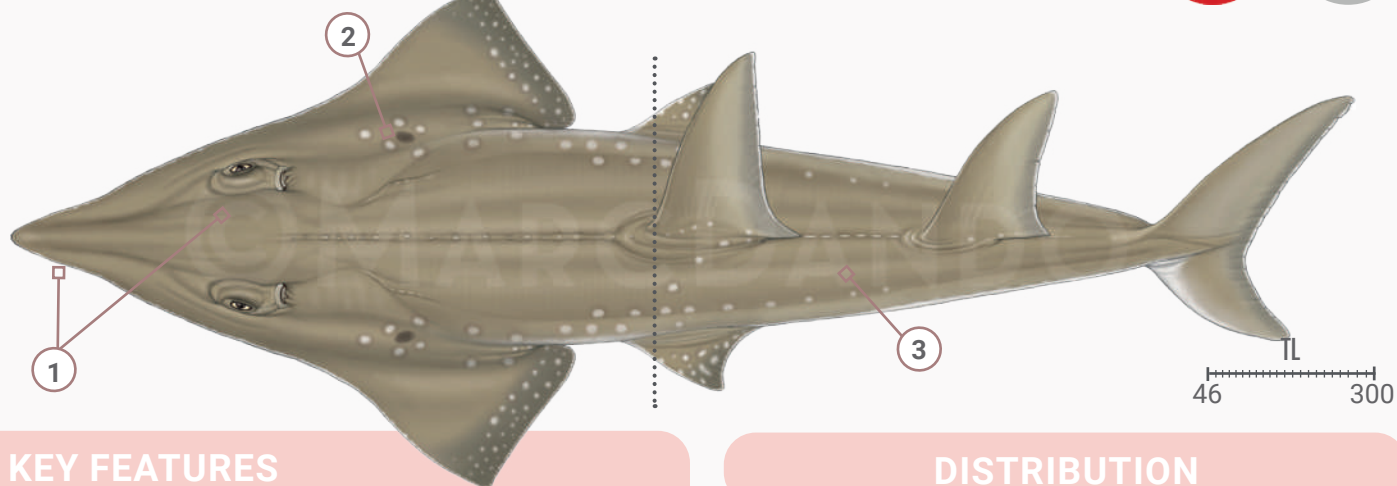
DISTRIBUTION



RHINOPRISTIFORMES - Family Rhinidae - Wedgefishes

BOTTLENOSE WEDGEFISH

Rhynchobatus australiae Whitley, 1939



KEY FEATURES

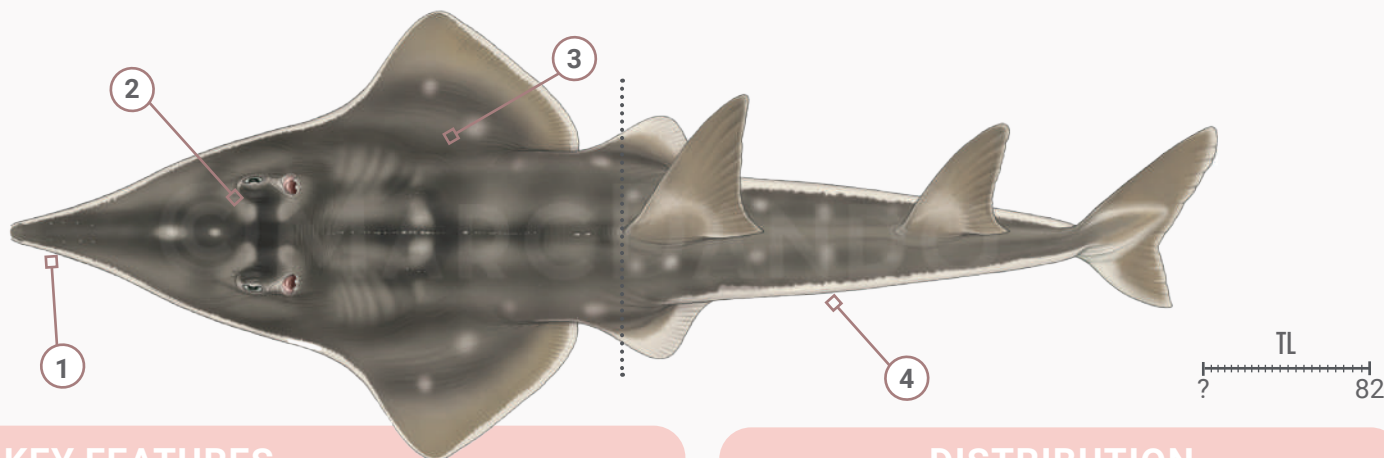
- ① Bottle-shaped snout slightly constricted near tip, no large dark spots over or behind eyes
- ② Black pectoral marking usually aligned with 3 white spots above and 2 spots below
- ③ Dorsal surface can be almost uniformly blackish with no markings in some adults

DISTRIBUTION



CLOWN WEDGEFISH

Rhynchobatus cooki Last, Kyne, & Compagno, 2016



KEY FEATURES

- 1 Snout narrowly pointed to weakly bottle-shaped with two irregular rows of large thorns on tip
- 2 Cross-like markings on head surrounded by four white blotches
- 3 Black pectoral fin markings absent
- 4 Prominent white margin along body

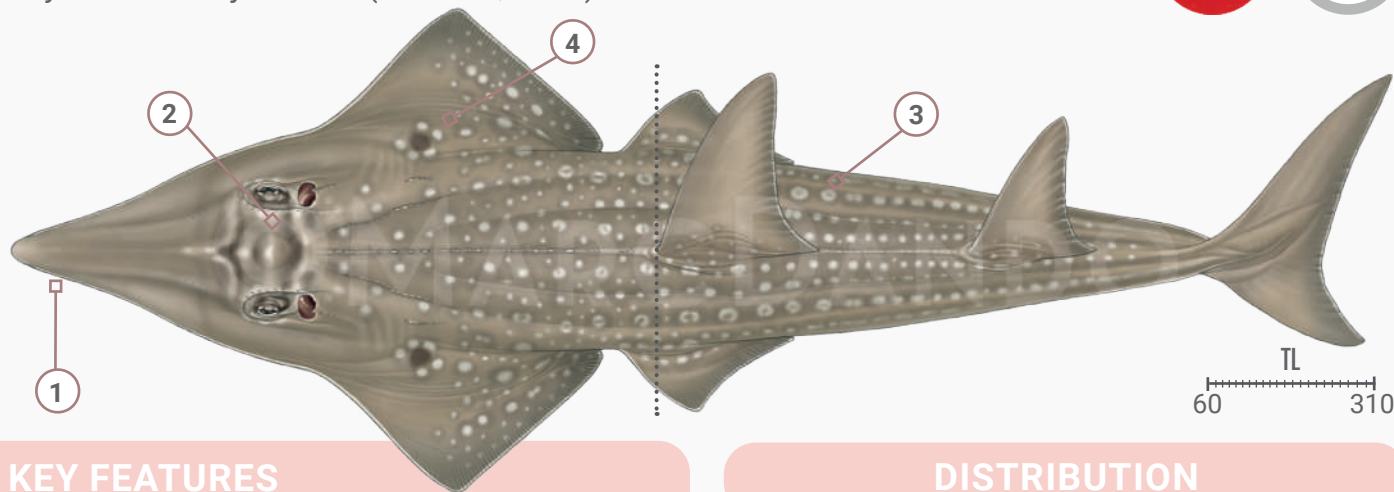
DISTRIBUTION



RHINOPRISTIFORMES - Family Rhinidae - Wedgefishes

WHITESPOTTED WEDGEFISH

Rhynchobatus djiddensis (Forsskål, 1775)



KEY FEATURES

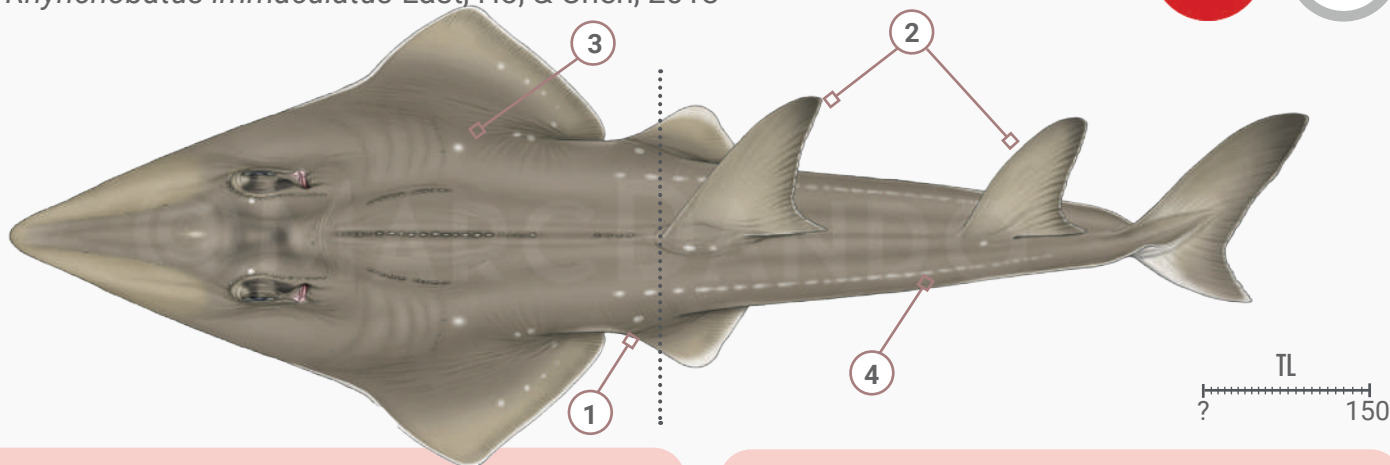
- ① Snout triangular, usually without a black blotch on underside
- ② Prominent black bars between eyes
- ③ Spots with ring-like dusky color pattern in adults
- ④ Black pectoral marking usually surrounded by 4 or more white spots

DISTRIBUTION



TAIWANESE WEDGEFISH

Rhynchobatus immaculatus Last, Ho, & Chen, 2013



KEY FEATURES

- ① Single white spot above pelvic fin origin
- ② Dorsal fins with dusky tips
- ③ Black pectoral fin markings absent
- ④ Row of small white spots originating over origin of pelvic fin and coalescing to form a line on tail

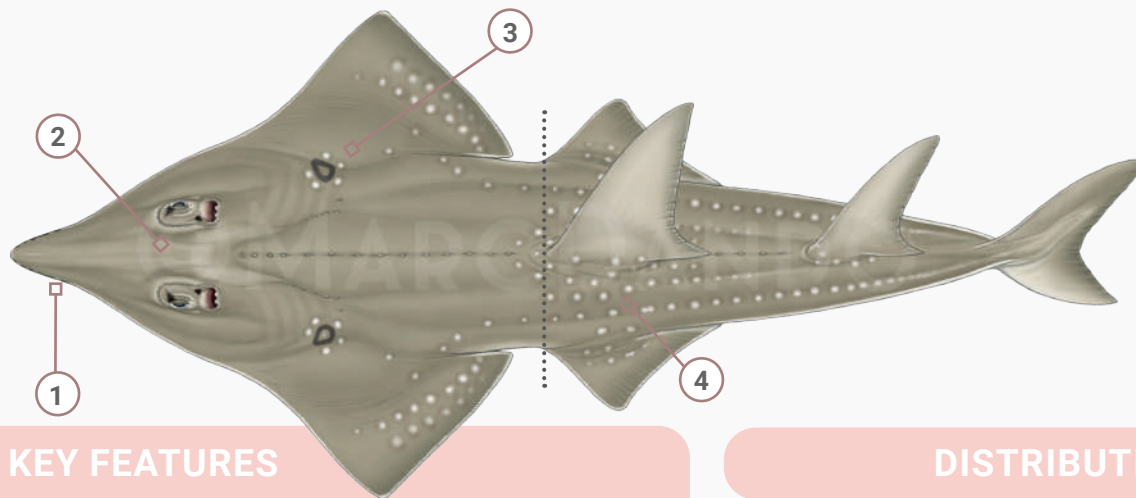
DISTRIBUTION



RHINOPRISTIFORMES - Family Rhinidae - Wedgefishes

SMOOTHNOSE WEDGEFISH

Rhynchobatus laevis (Bloch & Schneider, 1801)



KEY FEATURES

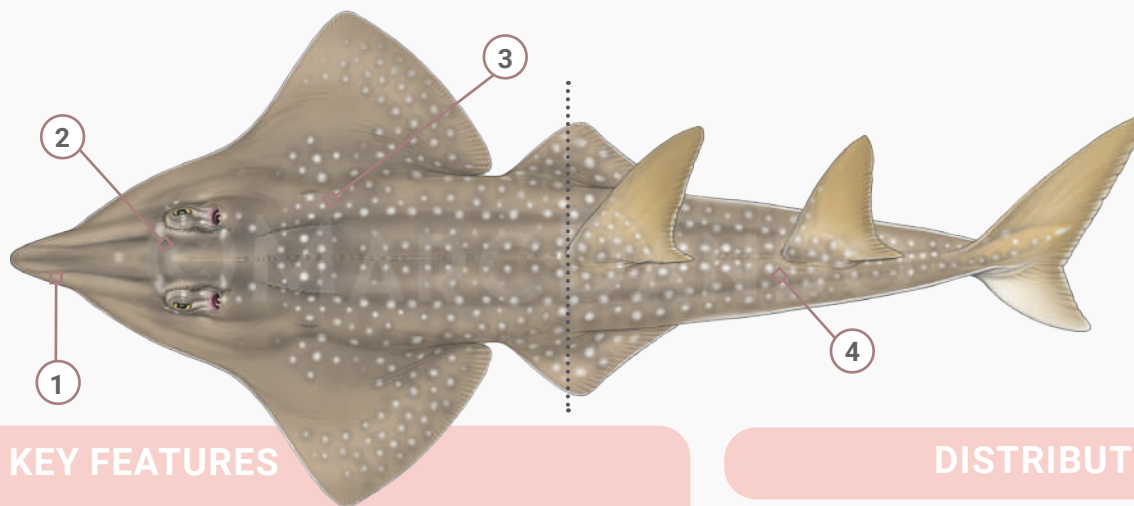
- ① Snout underside usually with dark blotch
- ② No dark bars between eyes
- ③ Black pectoral marking often ocellated, surrounded by 4–7 white spots
- ④ 4–5 rows of white spots along each side under D1

DISTRIBUTION



AFRICAN WEDGEFISH

Rhynchobatus luebberti Ehrenbaum, 1915



TL
79 300

KEY FEATURES

- 1 Paired rows of rostral thorns on the snout
- 2 Faint dark bars between eyes in young
- 3 Two large blackish blotches on shoulders (fading in adults)
- 4 Dense white spots with black contour extend all the way to the tail

DISTRIBUTION



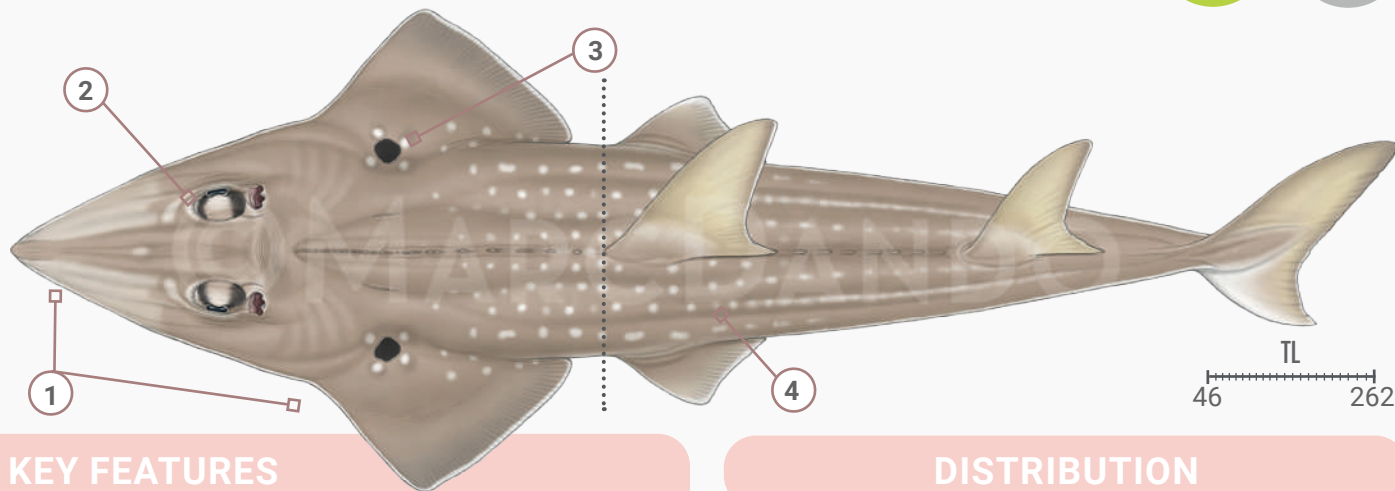
RHINOPRISTIFORMES - Family Rhinidae - Wedgefishes

EYEBROW WEDGEFISH

Rhynchobatus palpebratus Compagno & Last, 2008

NT

X



KEY FEATURES

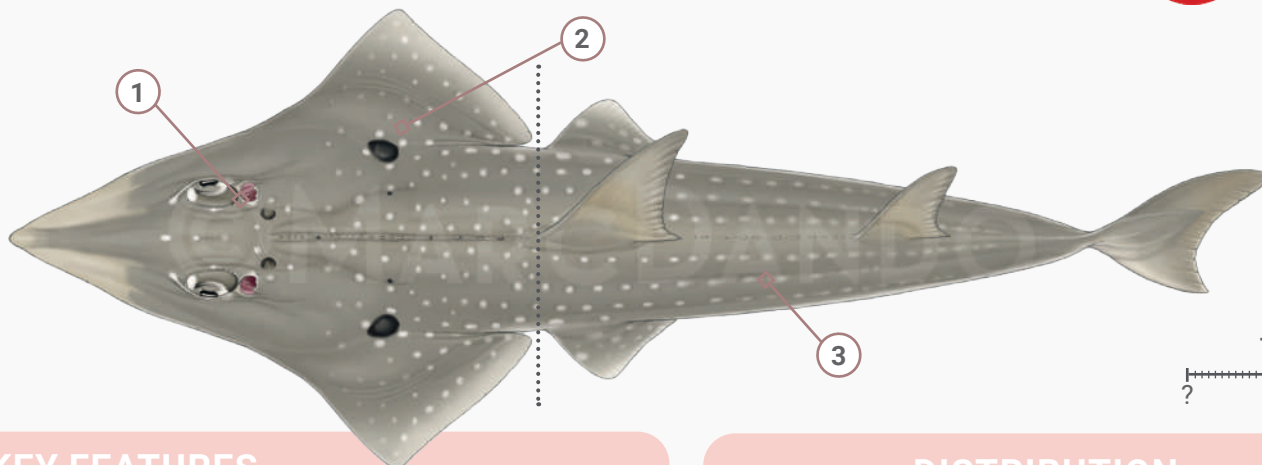
- 1 Snout with nearly straight anterior margin, convex between eyes and pectoral fins
- 2 Dark eyebrow-like markings often present on head
- 3 Black pectoral marking usually surrounded by 3–4 equally spaced white spots
- 4 2–4 rows of spots on each side under D1 forming a pale faint line continuing on trunk before tail

DISTRIBUTION



BROADNOSE WEDGEFISH

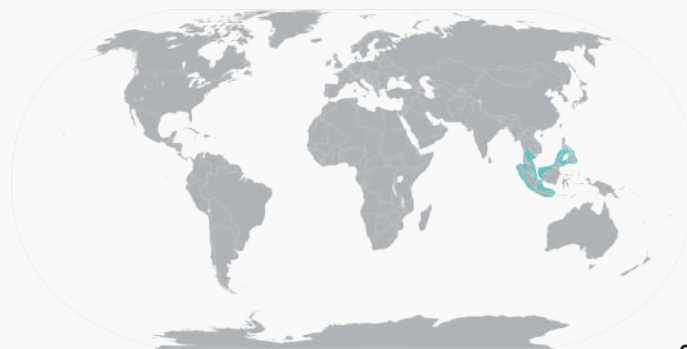
Rhynchobatus springeri Compagno & Last, 2010



KEY FEATURES

- 1 Usually dark markings on and/or behind eyes
- 2 Black pectoral marking usually surrounded by 3–4 white spots with outermost pair closer together than inner pair
- 3 3–4 rows of spots on each side extending along the tail sometimes forming pale lines

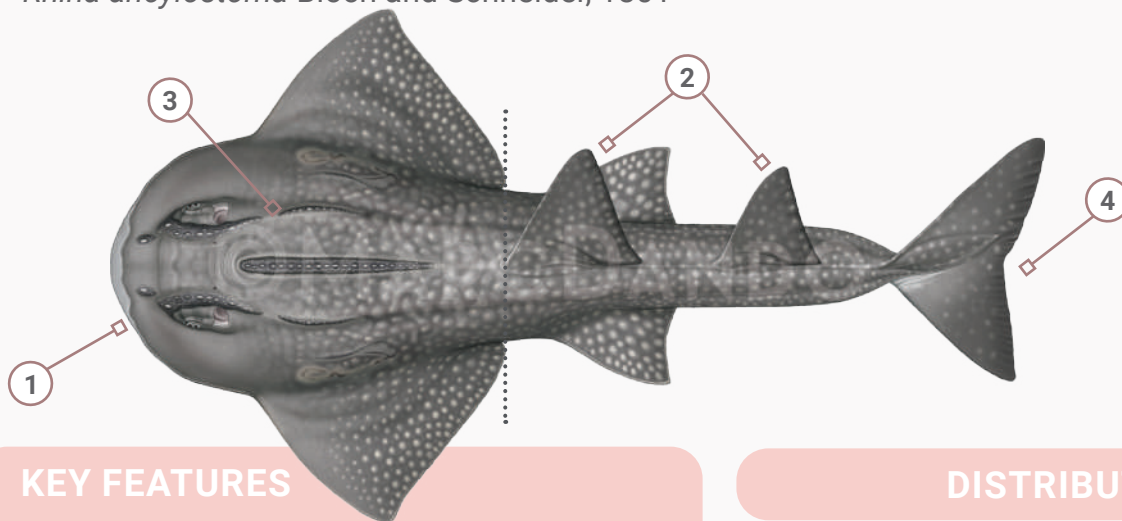
DISTRIBUTION



RHINOPRISTIFORMES - Family Rhinidae - Wedgefishes

BOWMOUTH GUITARFISH

Rhina ancylostoma Bloch and Schneider, 1801



KEY FEATURES

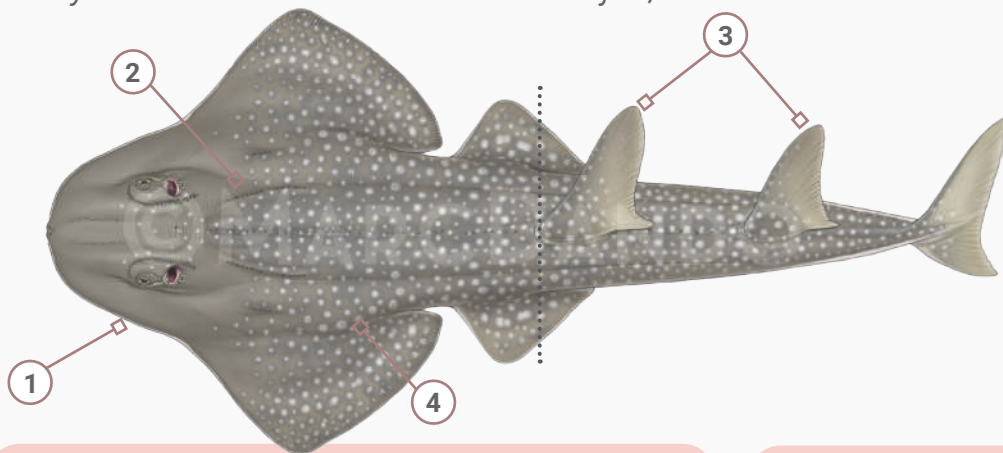
- ① Snout thick, broad, and rounded, well separated from pectoral fins
- ② Dorsal fins large, triangular
- ③ Prominent ridges on body with clusters of large thorns on head, back and shoulders
- ④ Caudal fin large and lunate, with lower lobe more than half the length of upper lobe

DISTRIBUTION



FALSE SHARK RAY

Rhynchorhina mauritaniensis Séret & Naylor, 2016



KEY FEATURES

- 1 Snout flattened and blunt, with small thorns at tip, large transverse black blotch on underside
- 2 Thorny patches of ridges above eyes, spiracles, shoulder, and mid-line of back
- 3 Dorsal fins large and falcate
- 4 Pectoral marking only present in young

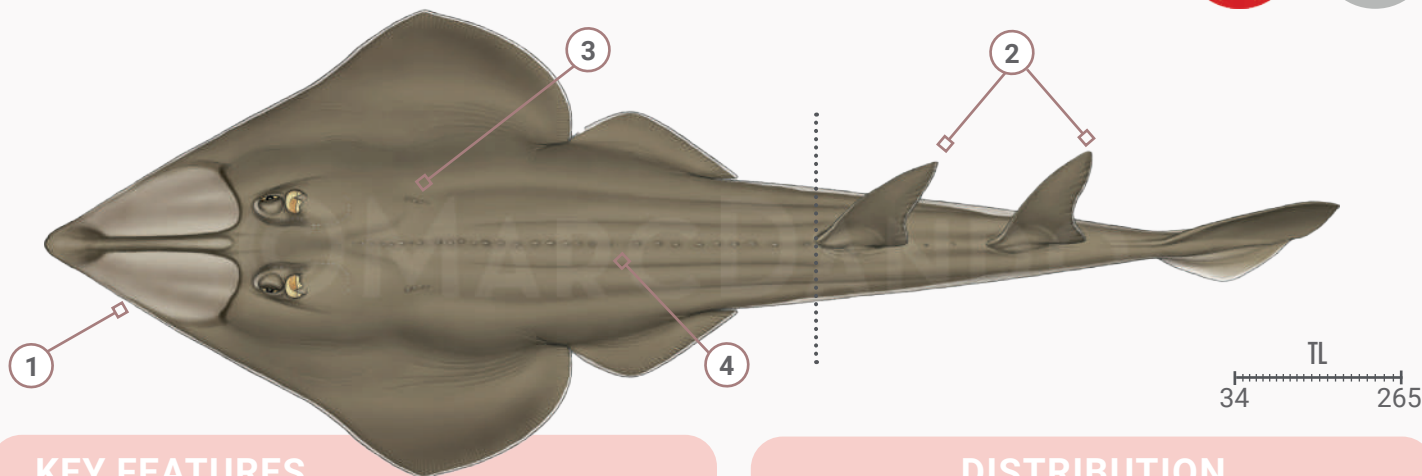
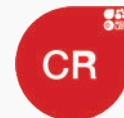
DISTRIBUTION



RHINOPRISTIFORMES - Family Glaucostegidae - Giant Guitarfishes

BLACKCHIN GUITARFISH

Glaucostegus cemiculus (Geoffroy St. Hilaire, 1817)



KEY FEATURES

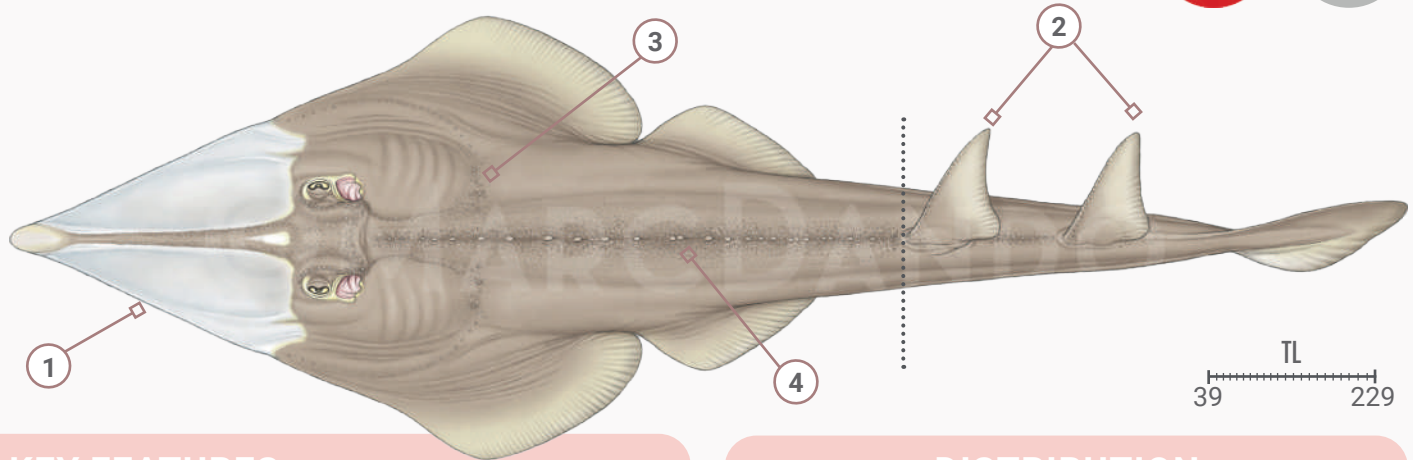
- ① Snout translucent, underside usually with dark blotch in juveniles, fading in adults
- ② Dorsal fins with apices narrowly rounded, widely spaced
- ③ Pair of 1–3 thorns on each shoulder
- ④ Denticles along mid-line of dorsal surface well defined, often enlarged and irregular

DISTRIBUTION



SHARPNOSE GUITARFISH

Glaucostegus granulatus (Cuvier, 1829)



KEY FEATURES

- ① Snout translucent, very long, narrow, and triangular
- ② Dorsal fins with bluntly pointed apices, narrowly spaced, margins sometimes paler
- ③ Pair of 2–3 large thorns on each shoulder
- ④ Denticles along mid-line of dorsal surface well defined, often enlarged and irregular

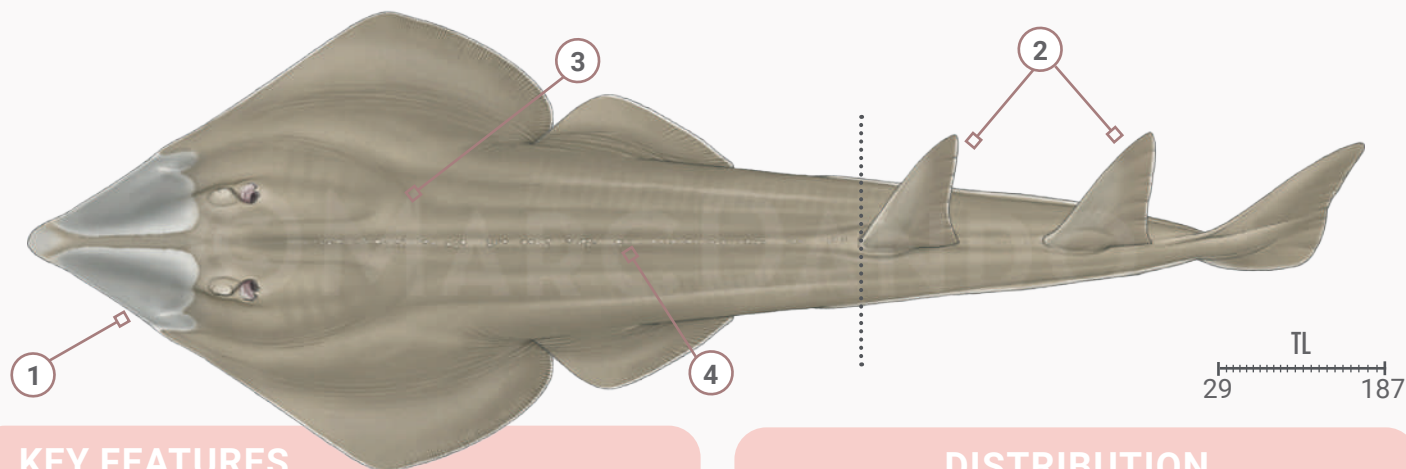
DISTRIBUTION



RHINOPRISTIFORMES - Family Glaucostegidae - Giant Guitarfishes

HALAVI GUITARFISH

Glaucostegus halavi (Fabricius, 1775)



KEY FEATURES

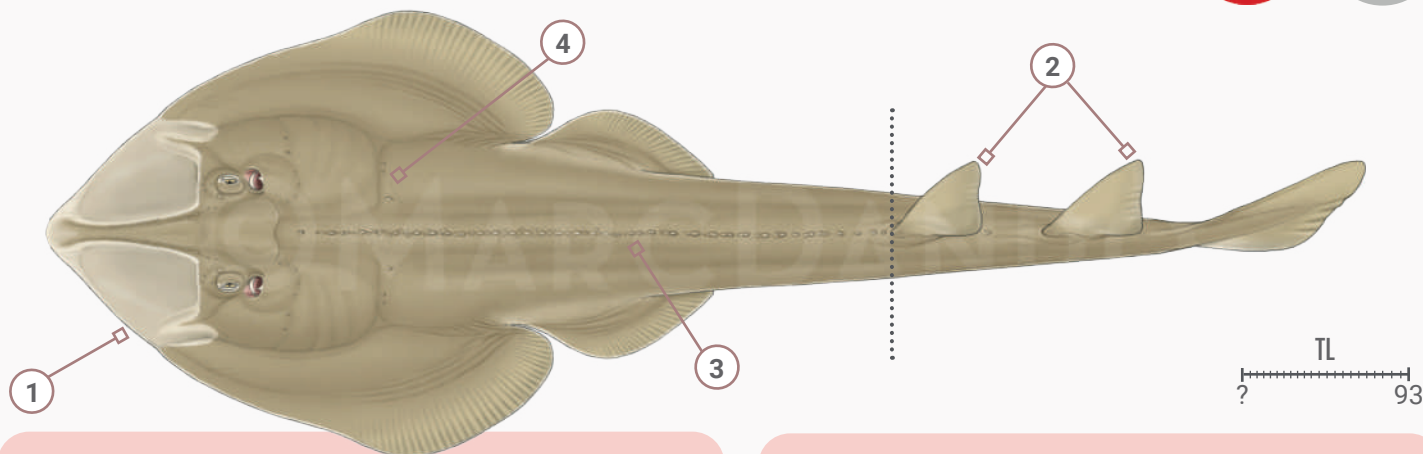
- ① Snout translucent, moderately long and broad, no dark blotch on underside
- ② Dorsal fins with pointed apices, well separated
- ③ Single large thorn on each shoulder
- ④ Denticles along mid-line of dorsal surface can be patchy but often forming ridge in adults

DISTRIBUTION



WIDENOSE GUITARFISH

Glaucostegus obtusus (Müller & Henle, 1841)



KEY FEATURES

- ① Snout translucent, very short and obtuse, shovel-shaped
- ② Dorsal fins short, rounded at apex
- ③ Denticles along mid-line of dorsal surface can be enlarged and irregular, especially in juveniles
- ④ Large thorns absent from each shoulder

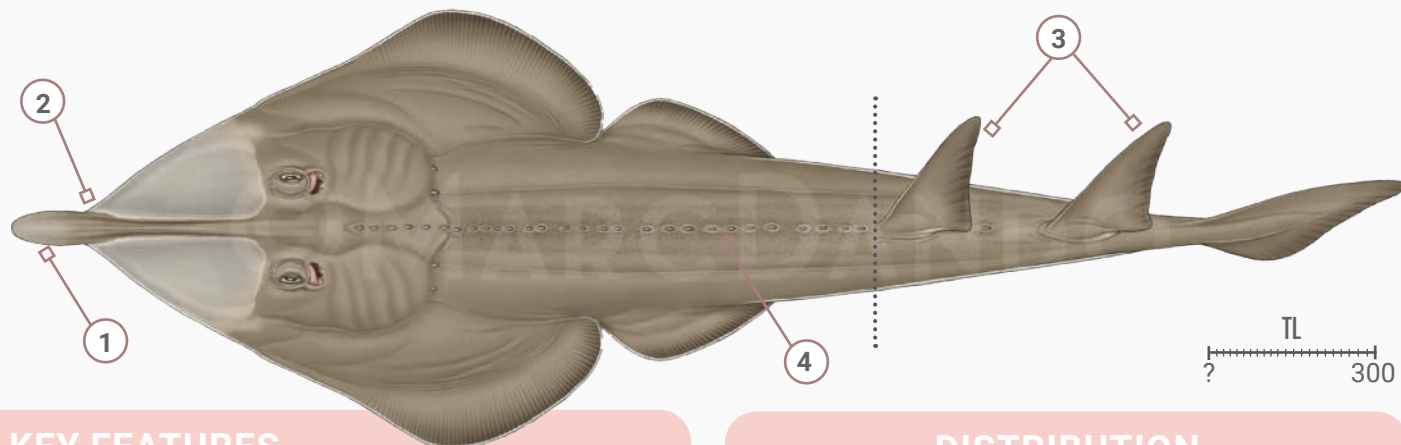
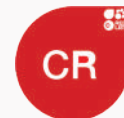
DISTRIBUTION



RHINOPRISTIFORMES - Family Glaucostegidae - Giant Guitarfishes

CLUBNOSE GUITARFISH

Glaucostegus thouin (Anonymous [Lacepède], 1798)



KEY FEATURES

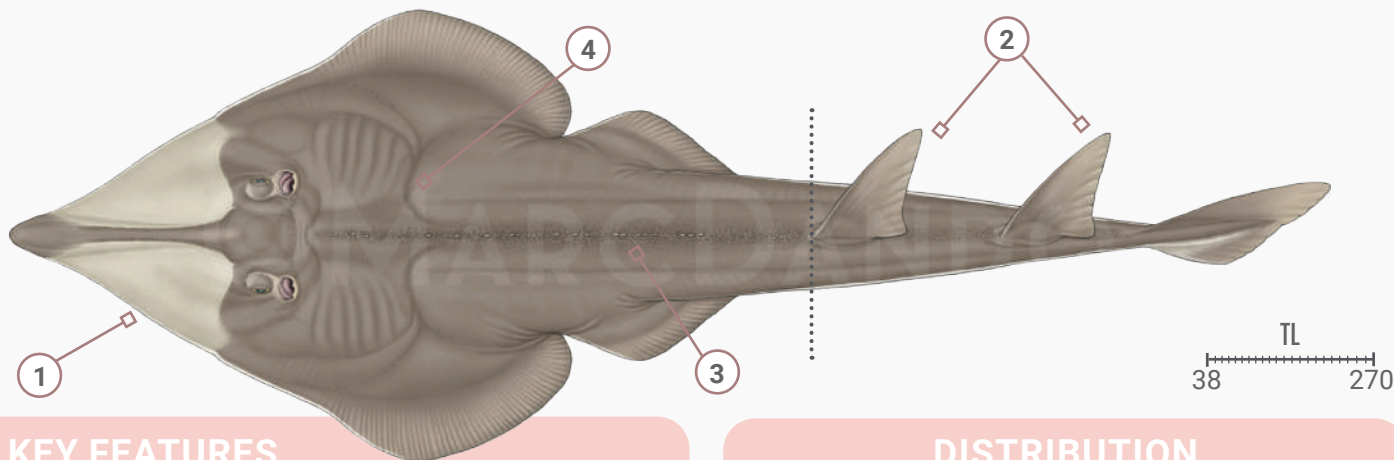
- ① Snout translucent, tip with large bulbous lobe projecting forward
- ② No dark blotch on underside of snout
- ③ Dorsal fins with pointed apices, narrowly spaced
- ④ Denticles along mid-line of dorsal surface distinct, irregular in shape, absent from each shoulder

DISTRIBUTION



GIANT GUITARFISH

Glaucostegus typus (Anonymous [Bennett], 1830)



KEY FEATURES

- ① Snout translucent, underside usually with dark blotch
- ② Dorsal fins with pointed apices
- ③ Denticles along mid-line of dorsal surface distinct, irregular in shape
- ④ No obvious thorn patch on each shoulder

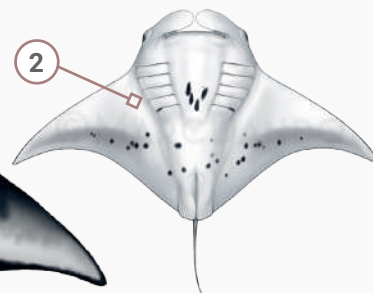
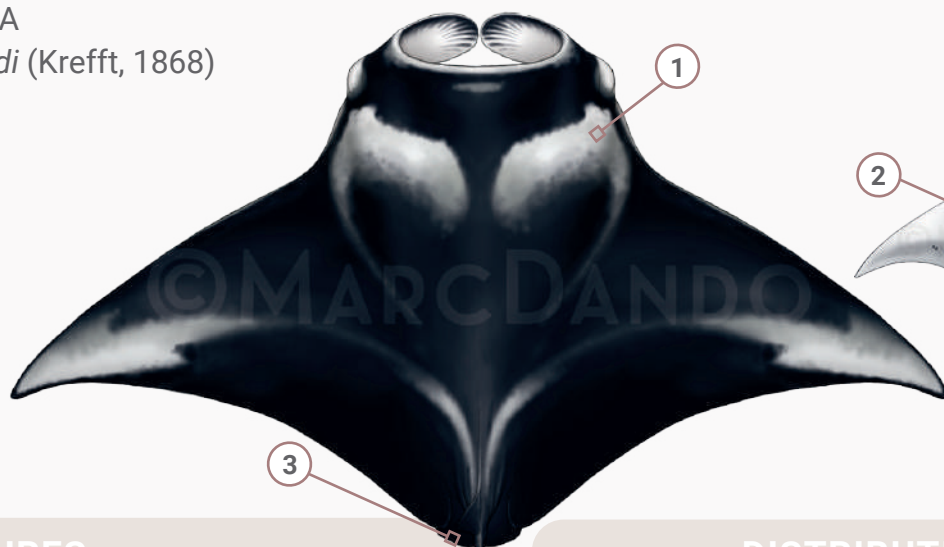
DISTRIBUTION



MYLIOBATIFORMES - Family Mobulidae - Mantas and Devil Rays

REEF MANTA

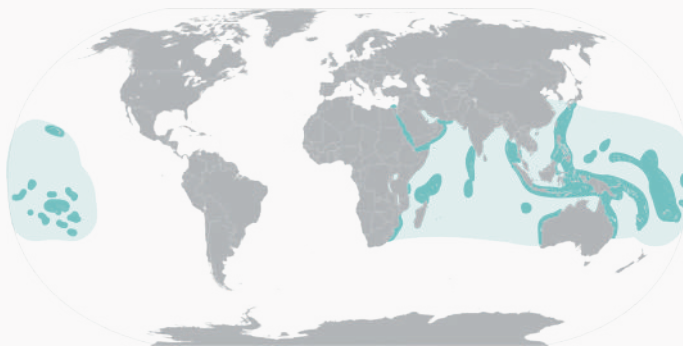
Mobula alfredi (Kreffft, 1868)



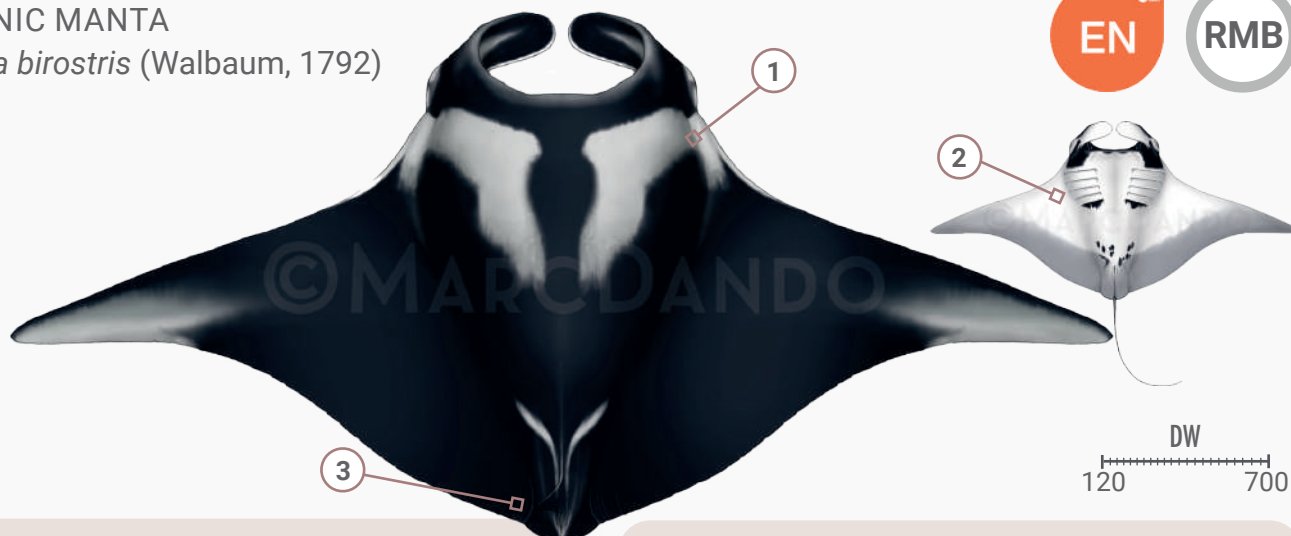
KEY FEATURES

- ① Front margins of white shoulder patches curving rearwards, forming black 'V' on dorsal surface
- ② Ventral spots between gill slits can be spread across abdominal region and pectoral fins
- ③ Tail length equal to or shorter than DW, base with slight depression, usually without a bulge or spine, no white tip on dorsal fin

DISTRIBUTION



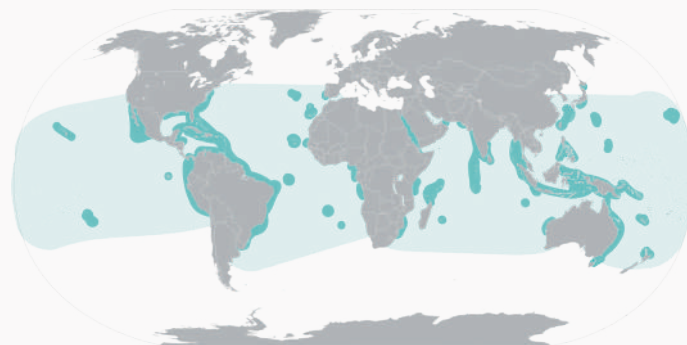
OCEANIC MANTA
Mobula birostris (Walbaum, 1792)



KEY FEATURES

- ① Front margins of white shoulder patches parallel with head, forming black 'T' on dorsal surface
- ② Ventral spots between gill slits can be spread around lower abdominal region
- ③ Tail length equal to or shorter than DW, base with slight depression, usually with bulge and embedded spine, no white tip on dorsal fin

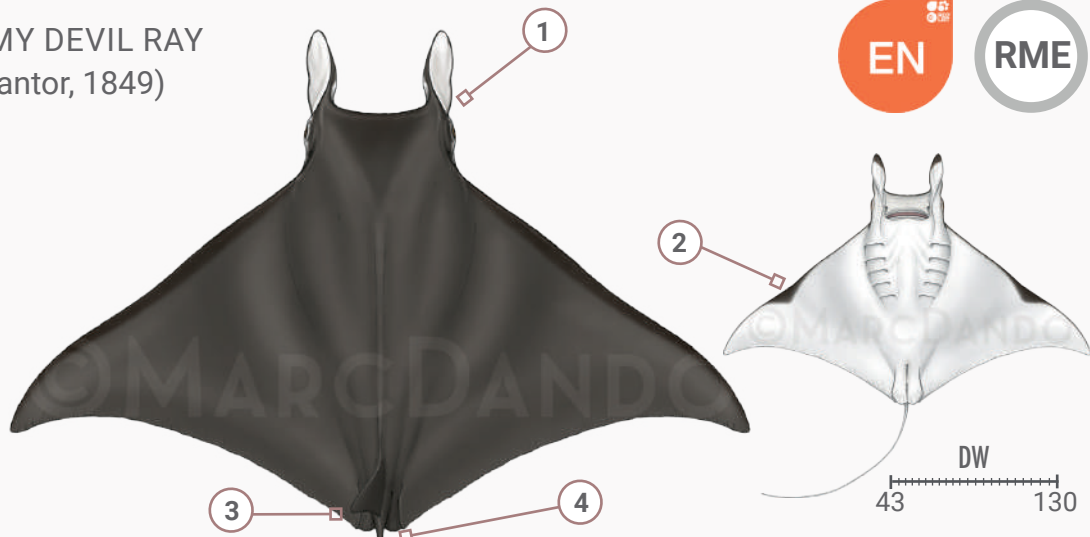
DISTRIBUTION



MYLIOBATIFORMES - Family Mobulidae - Mantas and Devil Rays

LONGHORNED PYGMY DEVIL RAY

Mobula eregoodoo (Cantor, 1849)



KEY FEATURES

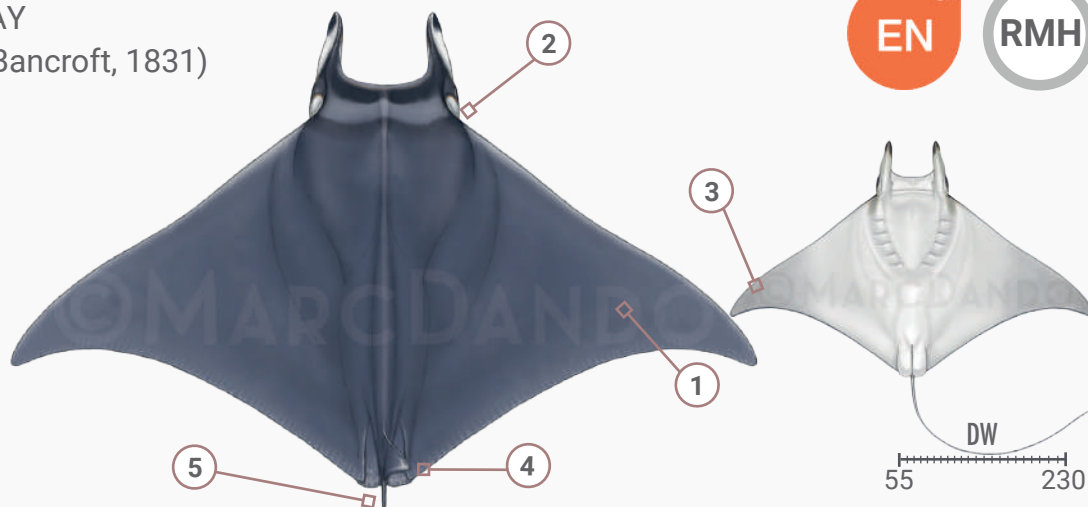
- ① Cephalic fins very long, length from tip of each fin to the corner of mouth more than 16% disc width
- ② Pectoral fins with dark brown strip along anterior margin, their margin straight to slightly curved
- ③ Dorsal fin can sometimes have white tip
- ④ Tail shorter than DW, base square shaped, no spine

DISTRIBUTION



ATLANTIC DEVIL RAY

Mobula hypostoma (Bancroft, 1831)



KEY FEATURES

- ① Dorsal coloration variable, sometimes with spots
- ② White ventral markings extend above eyes, dorsal coloration extends ventrally to first gill cover
- ③ White ventral surface, pectoral fins ends light grey
- ④ Dorsal fin often with light grey area in the middle
- ⑤ Tail shorter than DW, laterally compressed base, no spine

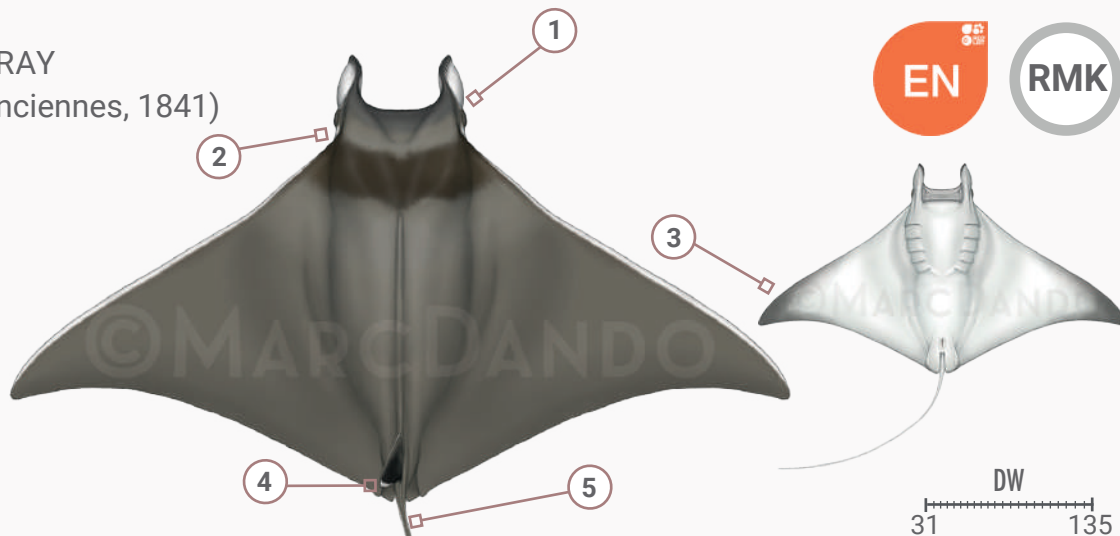
DISTRIBUTION



MYLIOBATIFORMES - Family Mobulidae - Mantas and Devil Rays

SHORTFIN DEVIL RAY

Mobula kuhlii (Valenciennes, 1841)



KEY FEATURES

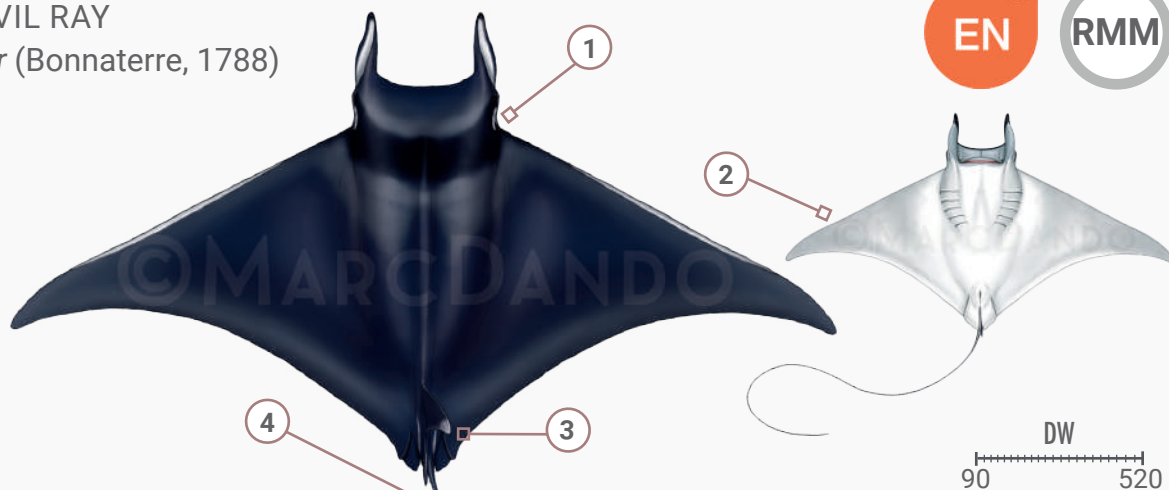
- ① Cephalic fins short, length from the tip of each fin to the corner of mouth less than 16% disc width
- ② White ventral markings do not extend to eye level
- ③ Pectoral fins can have dark brown at edge
- ④ Dorsal fin with white tip in some specimens
- ⑤ Tail shorter than DW, base square shaped, no spine

DISTRIBUTION



SPINETAIL DEVIL RAY

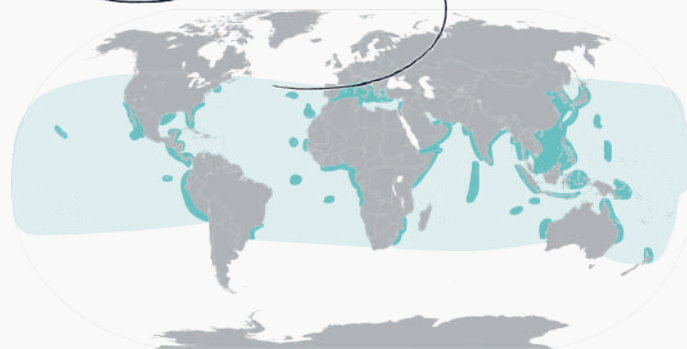
Mobula mobular (Bonnaterre, 1788)



KEY FEATURES

- ① White ventral markings extend above eye level
- ② Bright ventral surface with no markings
- ③ Dorsal fin elongated with distinct white tip
- ④ Tail equal to or longer than DW, base ventrally flattened, with caudal spine, row of small white thorns along both sides

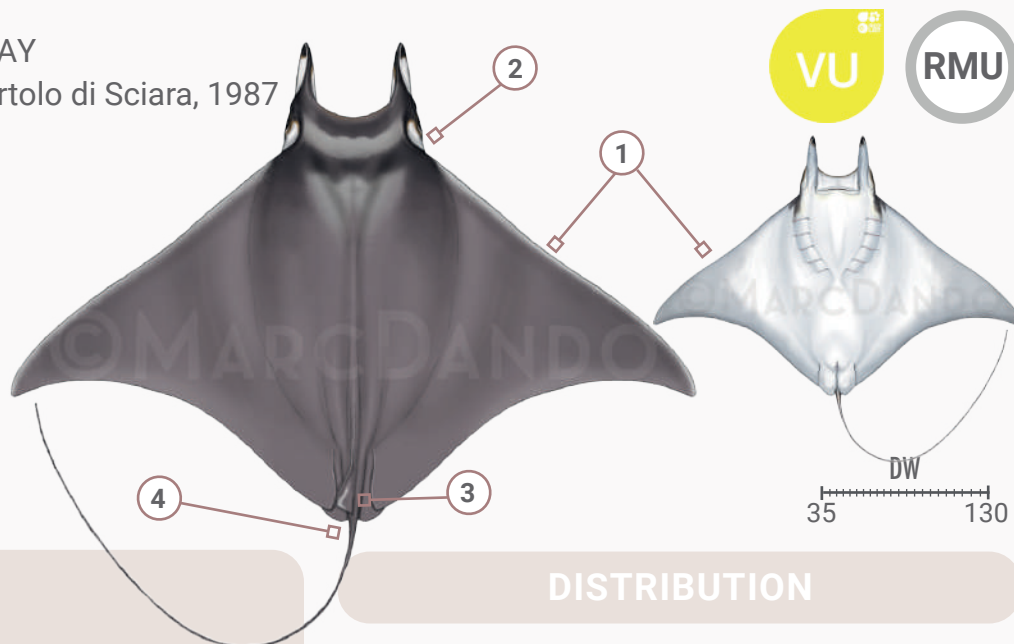
DISTRIBUTION



MYLIOBATIFORMES - Family Mobulidae - Mantas and Devil Rays

MUNK'S PYGMY DEVIL RAY

Mobula munkiana Notarbartolo di Sciara, 1987



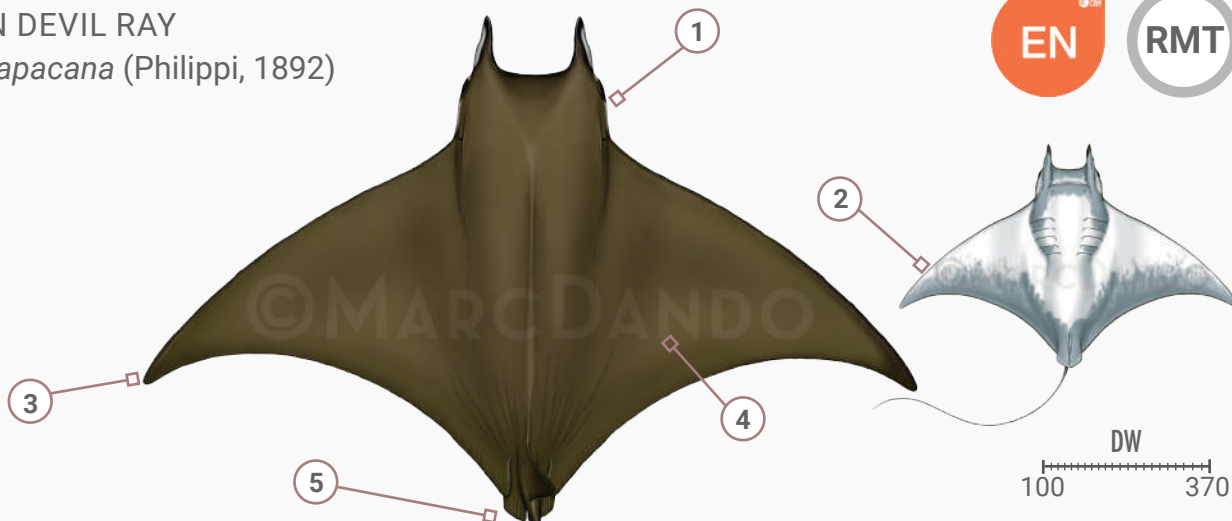
KEY FEATURES

- 1 White ventral surface, pectoral fins with increasing dark grey coloration at tips, light grey stripe along dorsal margin of pectoral fins
- 2 White ventral markings extend above eye level
- 3 Dorsal fin with dark rim along margin and grey in middle
- 4 Tail shorter than DW, no spine

DISTRIBUTION



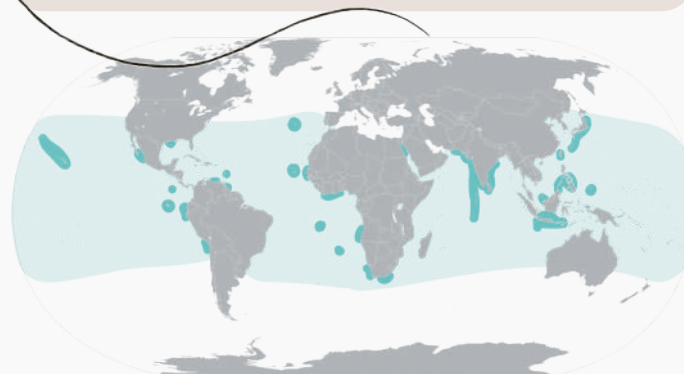
SICKLEFIN DEVIL RAY
Mobula tarapacana (Philippi, 1892)



KEY FEATURES

- ① White/grey ventral markings do not extend above eye level
- ② Ventral surface white and grey, pectoral fin posterior margin and gill slits with grey shading
- ③ Pectoral fins with distinctly curved margins
- ④ Dorsal fin plain in color
- ⑤ Tail shorter than DW, no spine

DISTRIBUTION



MYLIOBATIFORMES - Family Mobulidae - Mantas and Devil Rays

BENTFIN DEVIL RAY

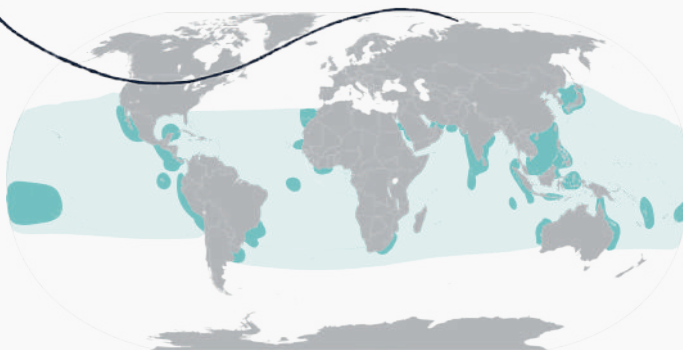
Mobula thurstoni (Lloyd, 1908)



KEY FEATURES

- 1 White ventral markings do not extend above eye
- 2 Ventral surface white with silver brown sheen at ends of pectoral fins
- 3 Pectoral fins with distinct double curvature on anterior margins
- 4 Dorsal fin with white tip, tail equal to or longer than DW, dorso-ventrally compressed, no spine

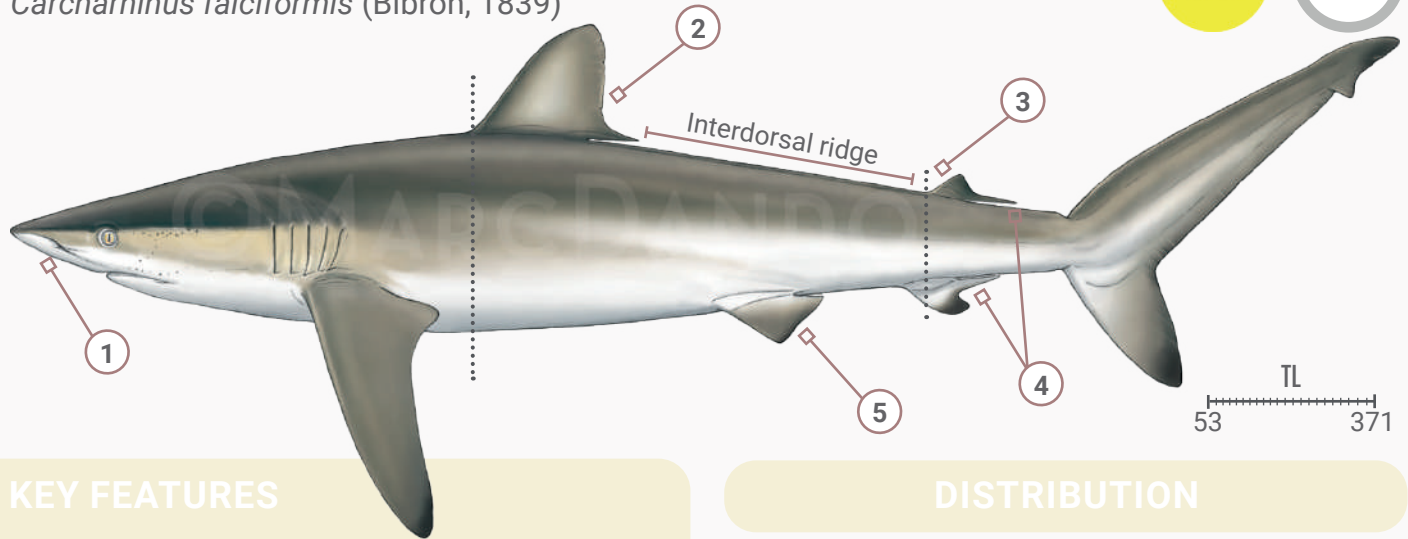
DISTRIBUTION



CARCHARHINIFORMES - Family Carcharhinidae - Requiem Sharks

SILKY SHARK

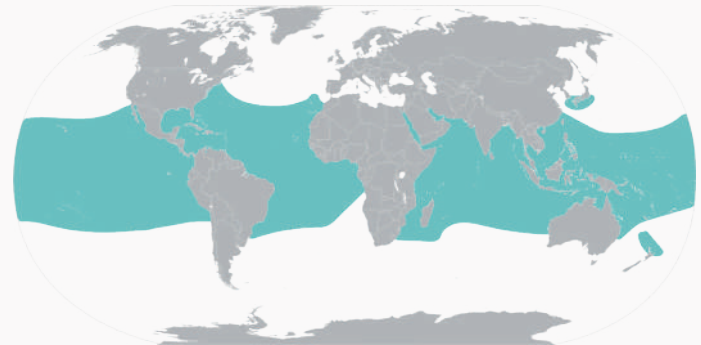
Carcharhinus falciformis (Bibron, 1839)



KEY FEATURES

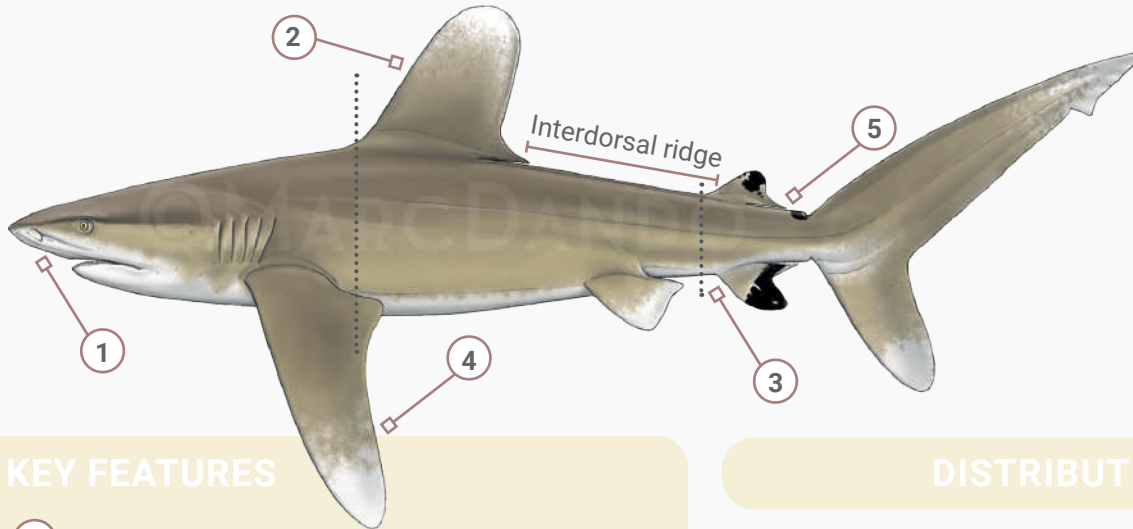
- 1 Snout moderately long and narrowly rounded
- 2 D1 low with moderately rounded apex, origin well behind free rear tip of pectoral fins
- 3 D2 very low, origin slightly behind anal fin origin, long free rear tip more than two times its height
- 4 Dorsal fins and anal fin with very long free rear tips
- 5 Dusky fin tips more obvious in juveniles

DISTRIBUTION



CARCHARHINIFORMES - Family Carcharhinidae - Requiem Sharks

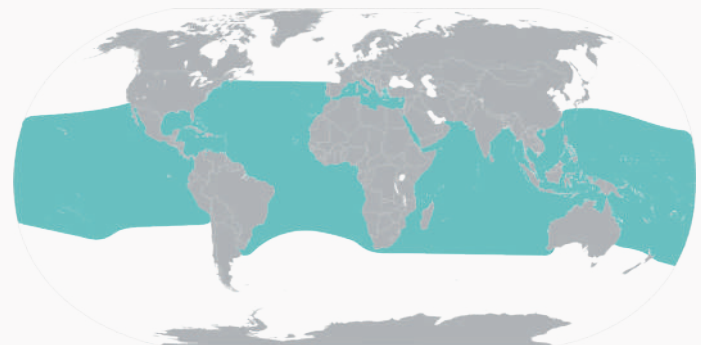
OCEANIC WHITETIP SHARK *Carcharhinus longimanus* (Poey, 1861)



KEY FEATURES

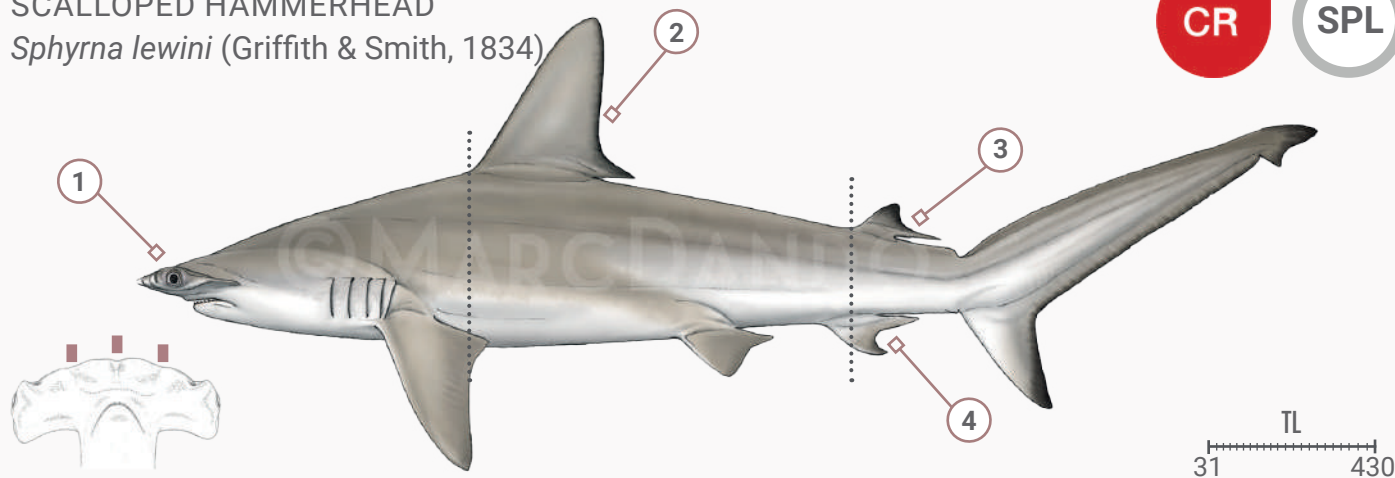
- 1 Snout short and broadly rounded
- 2 D1 high with broadly rounded apex, its origin over inner margins of pectoral fins
- 3 D2 origin slightly before anal fin origin
- 4 Pectoral fins broad, long with wide rounded tips
- 5 Juveniles usually with black tips on pelvic fins and black patches on caudal peduncle

DISTRIBUTION



CARCHARHINIFORMES - Family Sphyrnidae - Hammerhead Sharks

SCALLOPED HAMMERHEAD
Sphyrna lewini (Griffith & Smith, 1834)



KEY FEATURES

- 1 Head anterior margin curved, central notch
- 2 D1 tall, broad, its origin over or behind pectoral fin inner margins, free rear tip before pelvic fins origin
- 3 D2 small, its origin over or behind middle of anal fin, long free rear tip nearly to upper caudal fin origin
- 4 Anal fin base larger than D2 base, posterior margin deeply notched

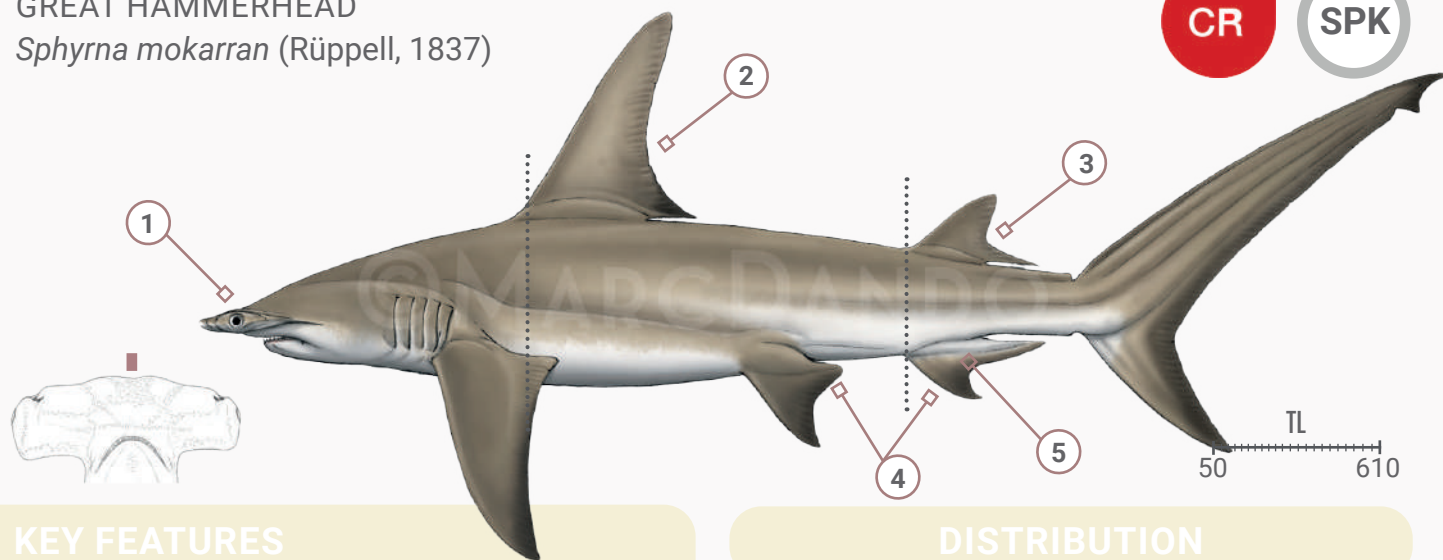
DISTRIBUTION



CARCHARHINIFORMES - Family Sphyrnidae - Hammerhead Sharks

GREAT HAMMERHEAD

Sphyrna mokarran (Rüppell, 1837)



KEY FEATURES

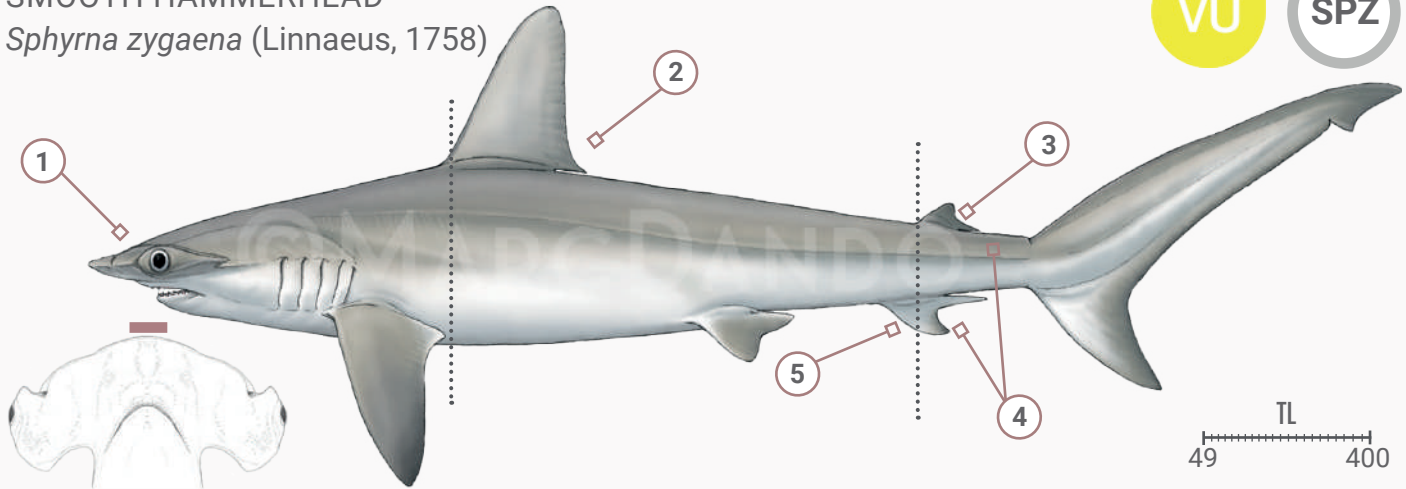
- ① Head anterior margin nearly straight, central notch
- ② D1 tall and curved, its origin over pectoral fins inner margins, free rear tip before pelvic fin origin
- ③ D2 tall, its origin slightly behind anal fin origin, short free rear tip not reaching upper caudal fin origin
- ④ D2, pelvic and anal fins posterior margins notched
- ⑤ Anal fin base equal to or larger than D2 base

DISTRIBUTION



SMOOTH HAMMERHEAD

Sphyrna zygaena (Linnaeus, 1758)



KEY FEATURES

- 1 Head broad and curved, lacking central notch
- 2 D1 tall, broad, its origin over pectoral fin inner margins, free rear tip well before pelvic fin origin
- 3 D2 small, its origin over or behind middle of anal fin, free rear tip not reaching upper caudal fin origin
- 4 D2 and anal fin bases about equal in length
- 5 Anal fin larger than D2, posterior margin notched

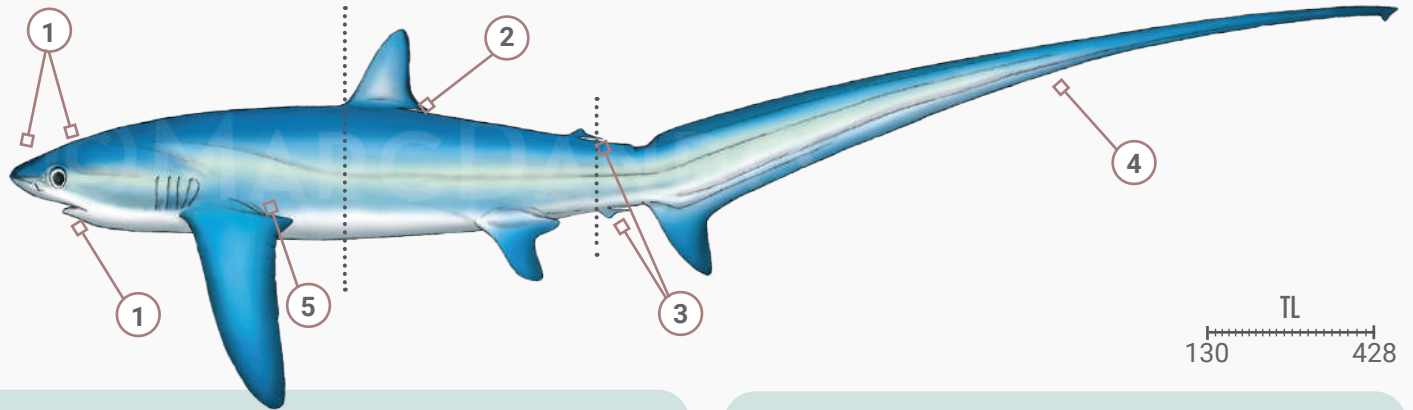
DISTRIBUTION



LAMNIFORMES - Family Alopiidae - Thresher Sharks

PELAGIC THRESHER

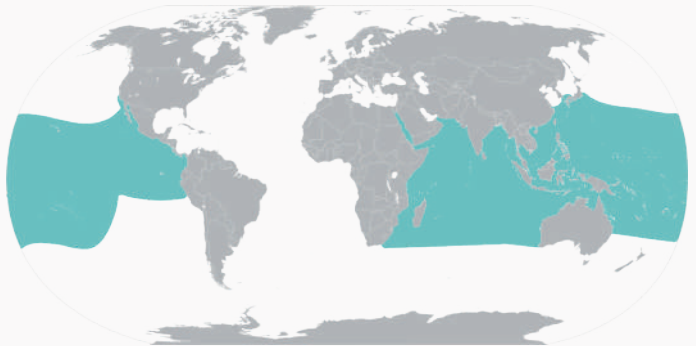
Alopias pelagicus Nakamura, 1935



KEY FEATURES

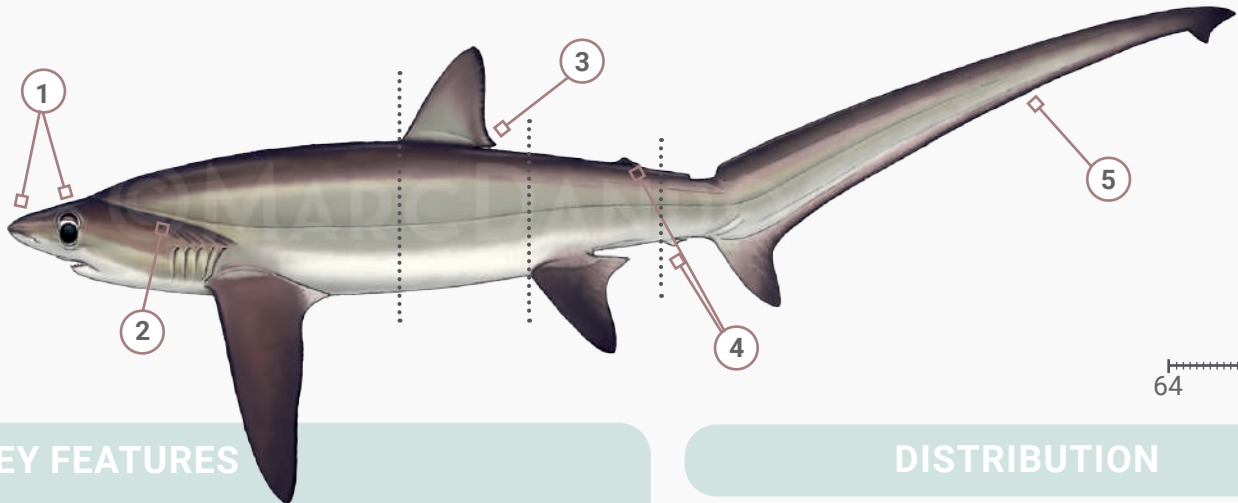
- ① Snout short, moderately large eyes not extending on top of head, no labial furrows on mouth
- ② D1 origin closer to pectoral fin rear tip than pelvic fin base
- ③ D2 and anal fin very small
- ④ Upper caudal lobe nearly as long as rest of body
- ⑤ No white patches above pectoral and pelvic fins

DISTRIBUTION



BIGEYE THRESHER

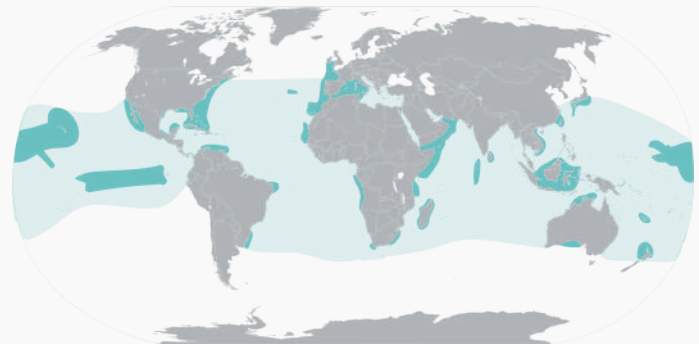
Alopias superciliosus (Lowe, 1841)



KEY FEATURES

- ① Snout short, very large eyes extending on top of head, no labial furrows on mouth
- ② Deep horizontal lateral grooves above gills
- ③ D1 closer to pelvic fin base than pectoral fin free rear tip
- ④ D2 and anal fin very small
- ⑤ Upper caudal lobe nearly as long as rest of body

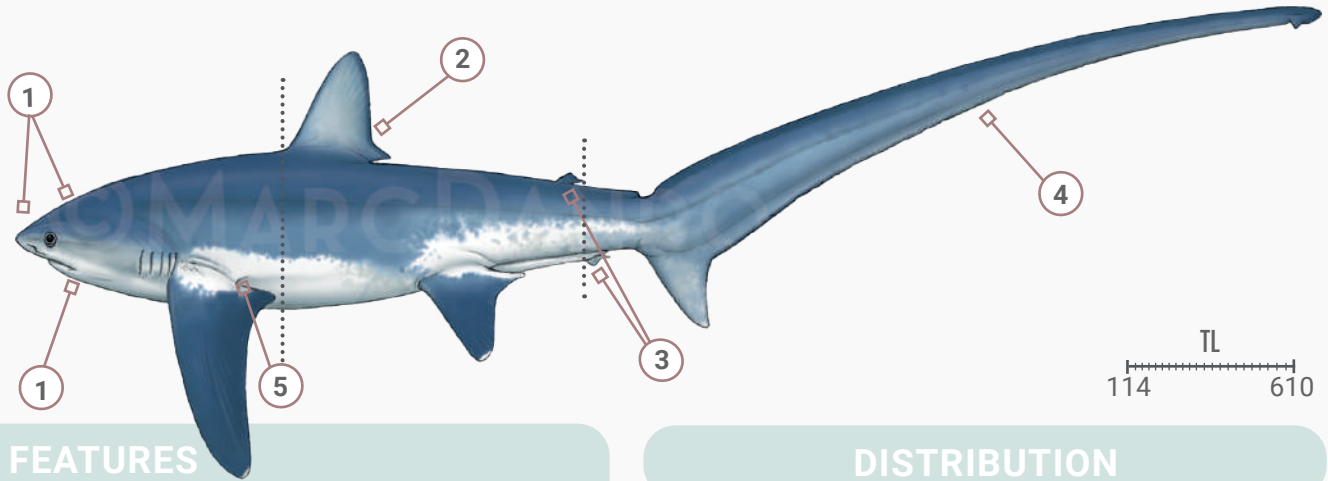
DISTRIBUTION



LAMNIFORMES - Family Alopiidae - Thresher Sharks

COMMON THRESHER

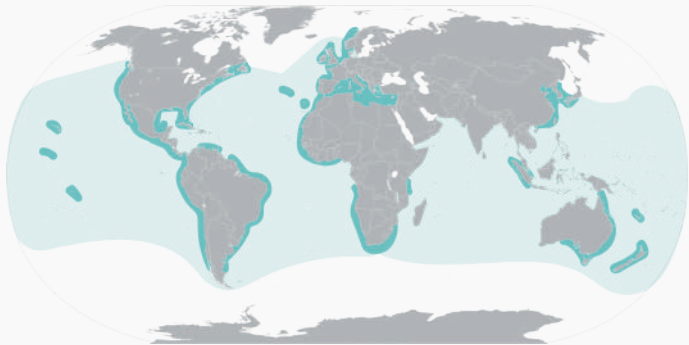
Alopias vulpinus (Bonnaterre, 1788)



KEY FEATURES

- ① Snout short, small eyes not extending on top of head, mouth with labial furrows present
- ② D1 almost midway between pectoral and pelvic fins, free rear tip over pelvic fins origin
- ③ D2 and anal fin very small
- ④ Upper caudal lobe nearly as long as rest of body
- ⑤ Ventral white extends above pectoral and pelvic fins

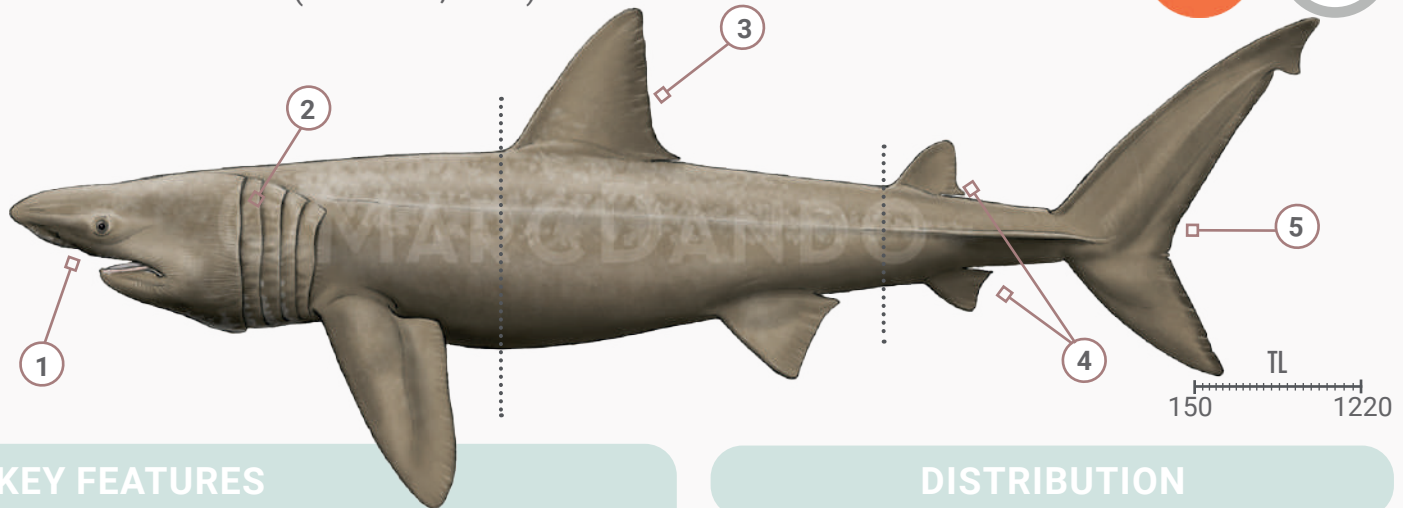
DISTRIBUTION



LAMNIFORMES - Family Cetorhinidae - Basking Shark

BASKING SHARK

Cetorhinus maximus (Gunnerus, 1765)



KEY FEATURES

- ① Snout long, pointed, and conical with huge subterminal mouth
- ② Gill slits extremely large almost encircling head
- ③ D1 high and angular, its origin behind free rear tips of pectoral fins
- ④ D2 and anal fin less than half the size of D1
- ⑤ Caudal fin lunate with prominent lateral keel

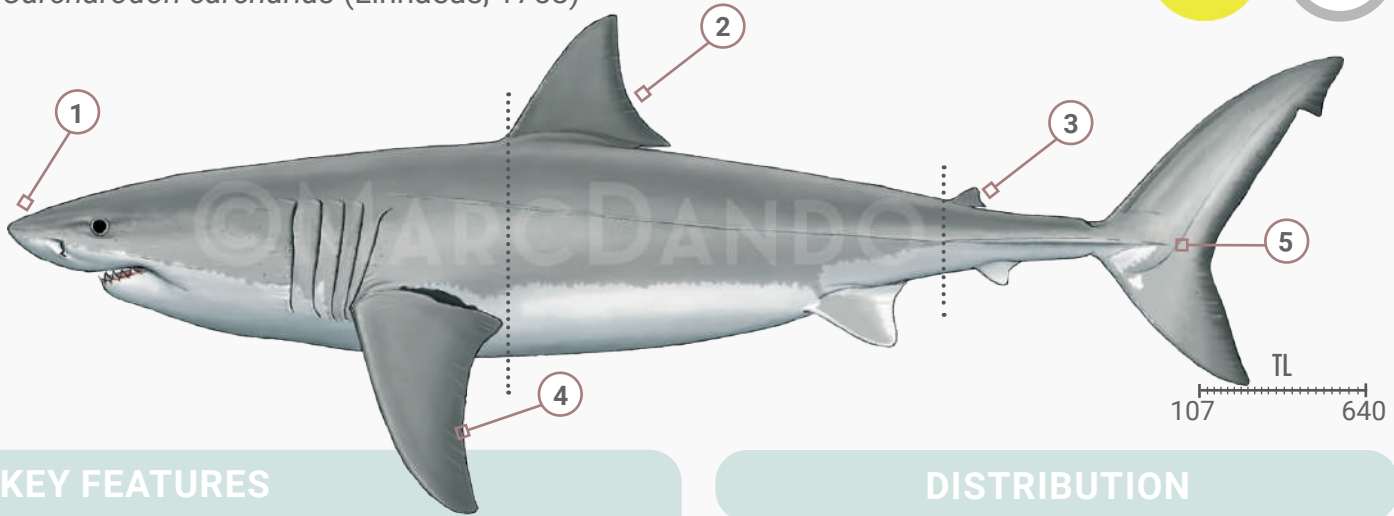
DISTRIBUTION



LAMNIFORMES - Family Lamnidae - Mackerel Sharks

GREAT WHITE SHARK

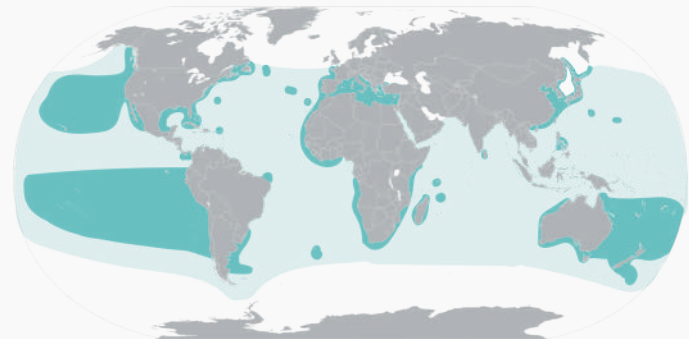
Carcharodon carcharias (Linnaeus, 1758)



KEY FEATURES

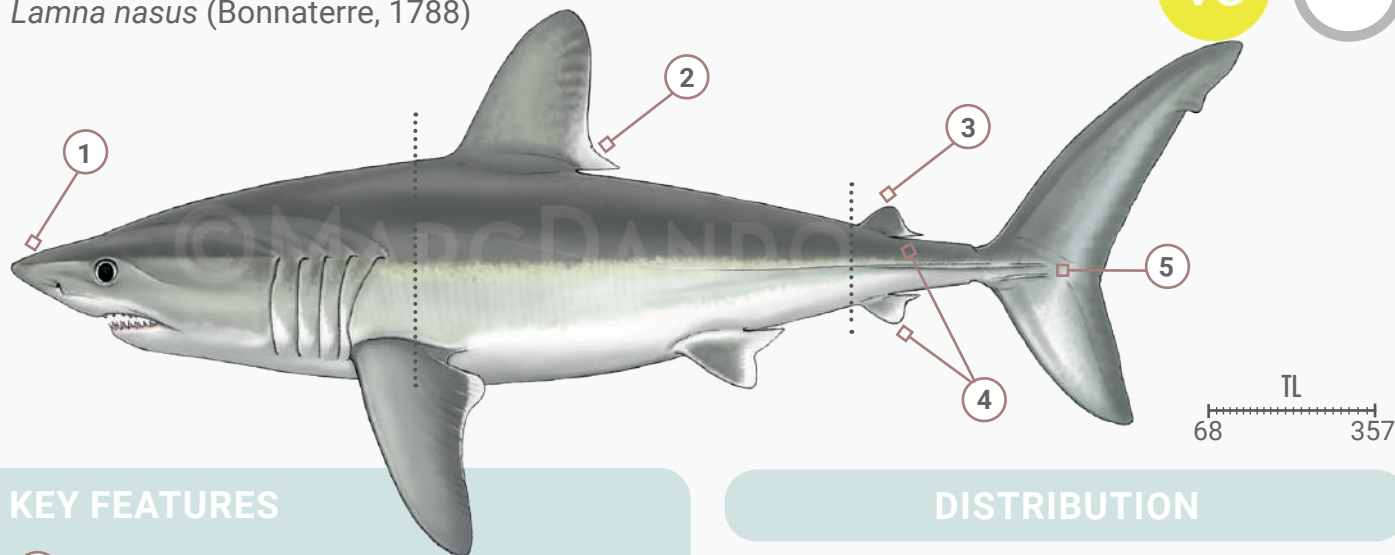
- 1 Snout short and conical with very black eyes
- 2 D1 large and triangular, with dark free rear tip, its origin over inner margins of pectoral fins
- 3 D2 smaller than anal fin, origin before anal fin origin
- 4 Pectoral fins underside with black tips and usually a black spot where rear tips join body
- 5 Caudal fin lunate with prominent lateral keel

DISTRIBUTION



PORBEAGLE SHARK

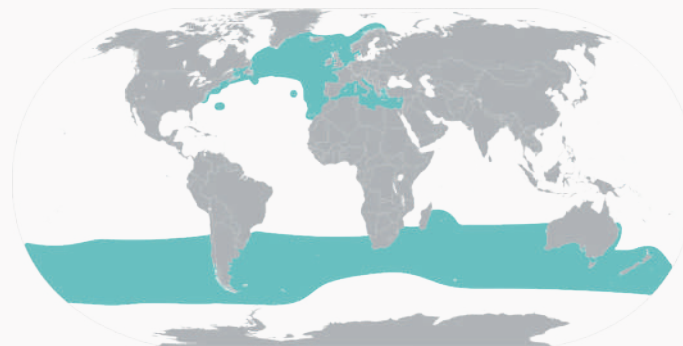
Lamna nasus (Bonnaterre, 1788)



KEY FEATURES

- 1 Snout long and conical with large dark eyes
- 2 D1 large with distinct white patch on free rear tip, origin over or slightly behind inner margins of pectoral fins (also with white inner margins)
- 3 D2 origin over or slightly before anal fin origin
- 4 D2 and anal fin very small
- 5 Caudal fin lunate with two prominent lateral keels

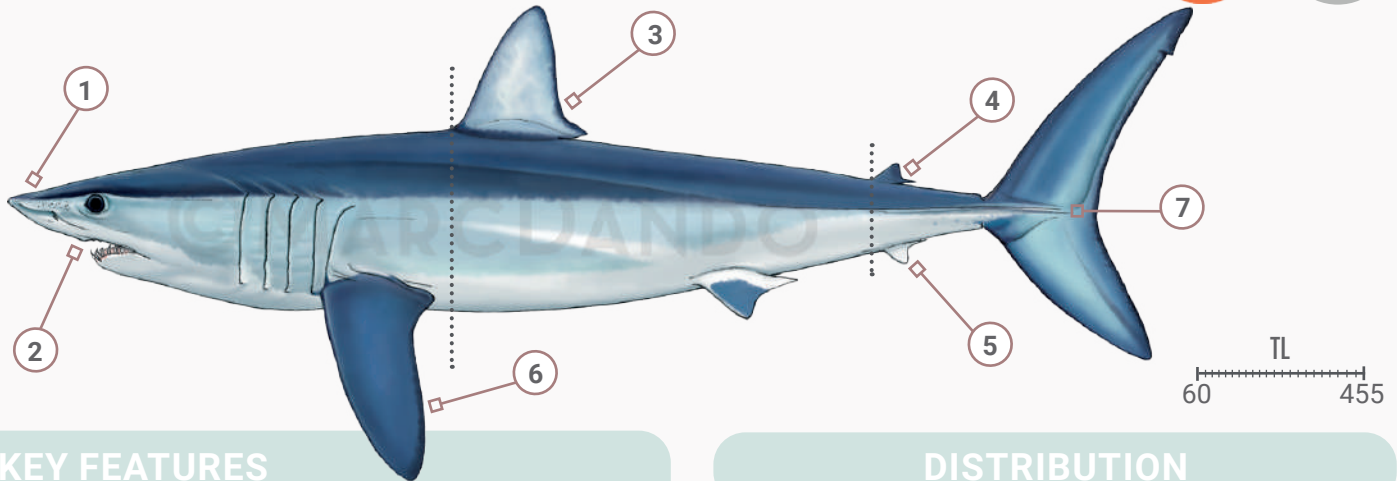
DISTRIBUTION



LAMNIFORMES - Family Lamnidae - Mackerel Sharks

SHORTFIN MAKO

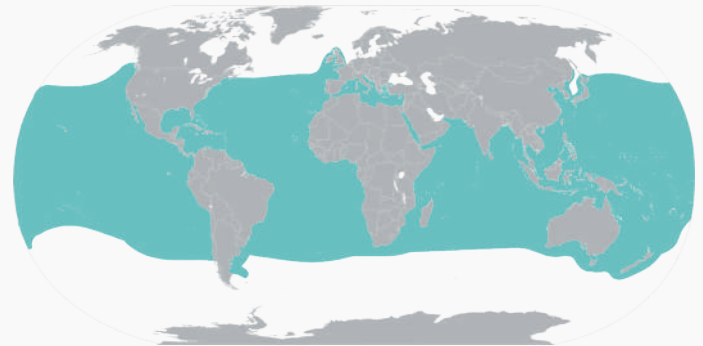
Isurus oxyrinchus Rafinesque, 1810



KEY FEATURES

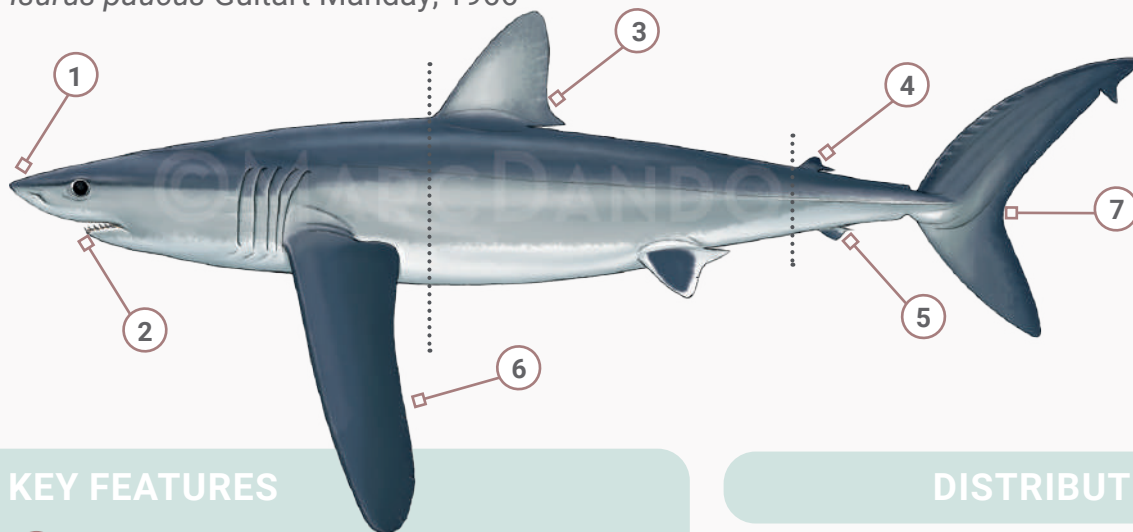
- 1 Snout pointed, conical with white underside
- 2 Teeth long and pointed, visible when mouth closed
- 3 D1 large, its origin behind rear tips of pectoral fins
- 4 D2 small, its origin before anal fin origin
- 5 Anal fin small, origin about middle of D2 base
- 6 Pectoral fin length shorter than head length
- 7 Caudal fin lunate with prominent lateral keel

DISTRIBUTION



LONGFIN MAKO

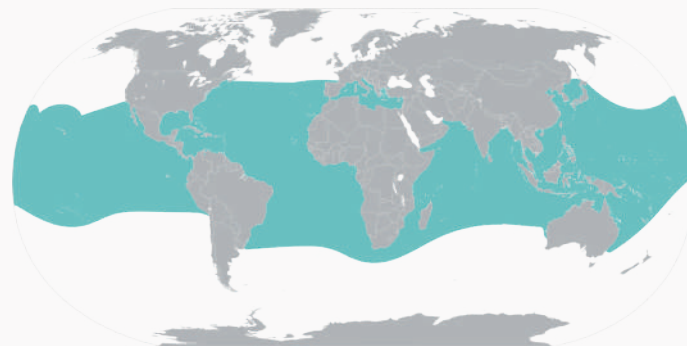
Isurus paucus Guitart Mandy, 1966



KEY FEATURES

- 1 Snout pointed, conical, dusky to dark underside
- 2 Teeth long and pointed, visible when mouth closed
- 3 D1 large, its origin behind rear tips of pectoral fins
- 4 D2 small, its origin before anal fin origin
- 5 Anal fin small, its origin about middle of D2 base
- 6 Pectoral fins as long or longer than head length
- 7 Caudal fin lunate with prominent lateral keel

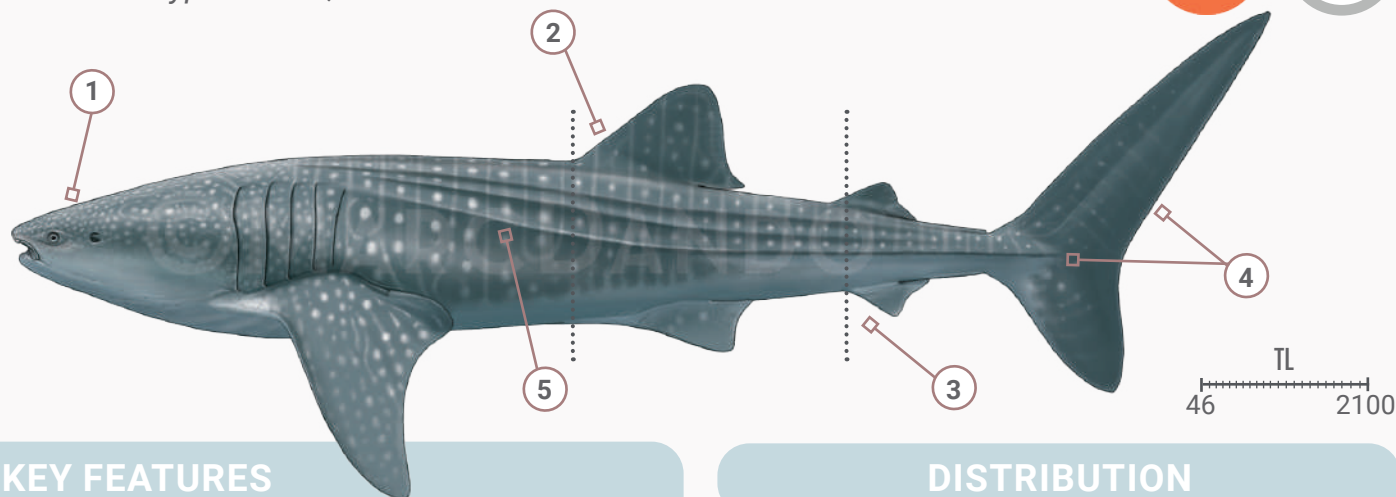
DISTRIBUTION



ORECTOLOBIFORMES - Family Rhincodontidae - Whale Shark

WHALE SHARK

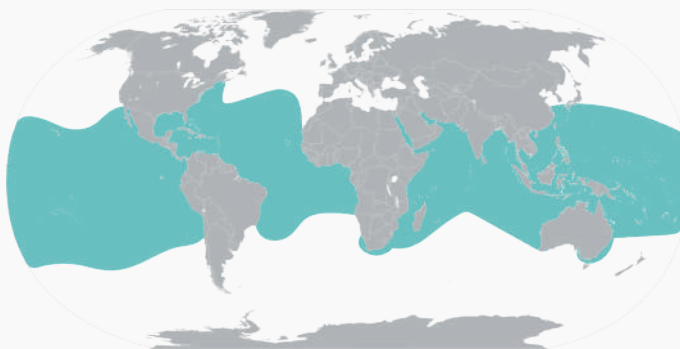
Rhincodon typus Smith, 1828



KEY FEATURES

- 1 Broad flat head, flattened short snout, wide mouth
- 2 D1 much larger than D2, set back on body, its origin partly over or slightly before pelvic fins
- 3 Anal fin almost same size as D2, its origin slightly behind D2 origin
- 4 Caudal fin semi-lunate with prominent lateral keel
- 5 Prominent ridges on dorsal surface and sides

DISTRIBUTION



SPECIES PLATES

The following pages are provided to showcase pictures of fresh unprocessed carcasses of CITES-listed species taken during surveys in various parts of the world. Whole carcasses are generally easy to identify when landed fresh. However, if landings are old, this can become challenging as colors or patterns may fade or sections of the carcasses might even start turning red. It is therefore important to focus the identification of species on using key features as described in the species accounts.

BOTTLENOSE WEDGEFISH -- *Rhynchobatus australiae*



WHITESPOTTED WEDGEFISH --
Rhynchobatus djiddensis



BOWMOUTH GUITARFISH -- *Rhina ancylostoma*



HALAVI GUITARFISH -- *Glaucostegus halavi*



SHORTFIN MAKO -- *Isurus oxyrinchus*



LONGFIN MAKO -- *Isurus paucus*



SCALLOPED HAMMERHEAD -- *Sphyrna lewini*



GREAT HAMMERHEAD -- *Sphyrna mokarran*



SMOOTH HAMMERHEAD -- *Sphyrna zygaena*



BASKING SHARK -- *Cetorhinus maximus*



PELAGIC THRESHER -- *Alopias pelagicus*



BIGEYE THRESHER -- *Alopias superciliosus*



SILKY SHARK -- *Carcharhinus falciformis*



OCEANIC WHITETIP SHARK-- *Carcharhinus longimanus*



OCEANIC MANTA -- *Mobula birostris*



BENTFIN DEVIL RAY -- *Mobula thurstoni*



PHOTOGRAPHS IN THE FIELD

It is sometimes important to take photographs while in the field to confirm species identification. Below are the key four photographs that should be taken for sharks and shark-like rays (Order Rhinopristiformes): (A) whole carcass (lateral view); (B) close up of trunk to show colors of fins (also check for presence of interdorsal ridge); (C) close up of the under-side of the head showing the mouth; and (D) upper and lower teeth.



For mobulids rays, photographs showing each of the following characteristics should be taken: (A) whole carcass dorsally (entire dorsal view); (B) spiracle, eyes, and cephalic fins; (C) close up of the dorsal fin and the base of the tail; and (D) whole carcass ventrally (entire ventral view). It is also important to take pictures of any markings present (i.e., white tip on the dorsal fin or ventral spots between gill slits).



SHARKS, RAYS, AND CITES

Sharks and rays

Around the world, there are over 1,250 species of sharks and rays. While these species exhibit diverse life-history characteristics, many are slow growing, late to mature, have low reproductive rates and are long-lived, making them susceptible to fishing pressure. Over the last few decades, many populations have seen drastic declines in their numbers requiring management actions to ensure their long-term survival. To ensure their recovery, various conservation strategies and context-specific approaches have been developed and are being implemented globally focusing on ensuring fisheries are sustainable and trade is controlled.

What is CITES?

CITES – the Convention on International Trade in Endangered Species of Wild Fauna and Flora – is

an international agreement between governments that works to ensure international trade in specimens of wild animals and plants is legal, sustainable, and traceable.

All 35,000 + species covered under the CITES convention are listed in three Appendices, according to the degree of protection they need.

- **Appendix I** includes species threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances.
- **Appendix II** includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival.
- **Appendix III** contains species that are protected in at least one Party (member country), which

has asked other CITES Parties for assistance in controlling the trade. Changes to Appendix III follow a distinct procedure from changes to Appendices I and II, as each Party is entitled to make unilateral amendments to it.

A specimen of a CITES-listed species, or products derived thereof, may be imported into or exported (or re-exported) from a Party to the Convention only if the appropriate document has been obtained and presented for clearance at the port of entry and exit. There is some variation in the requirements from one country to another and it is always necessary to check on the national laws that may be stricter.

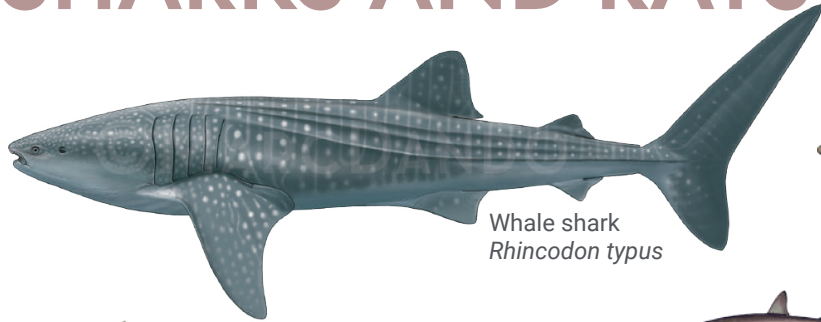
Overall, international trade of products derived from sharks and rays listed in Appendix I and II requires the CITES Management Authority of exporting countries to issue export documents certifying that the trade in each specimen is legal and not detrimental to the survival of the species. Customs personnel of both exporting and importing nations therefore must be able to recognize the traded products of these species and be able to readily identify illicit

trade (i.e., trade across international borders without corresponding CITES documentation) in order to be able to effectively implement and enforce their CITES obligations.

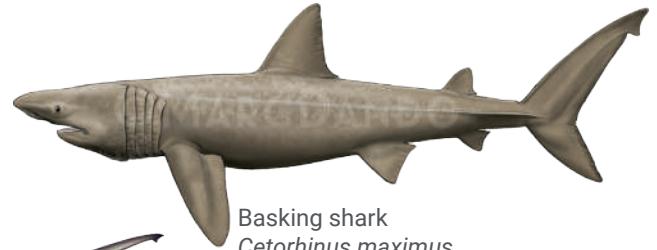
For additional information on the types of permits required, supporting documentation, number and type of species covered under the convention, please visit www.cites.org.

The spread on the following page provides an overview of the 10 families and 44 species of sharks and rays currently listed on CITES. The five species of sawfishes (*Pristis* and *Anoxypristis*) are listed on Appendix I while all other species are listed on Appendix II. An asterisk (*) next to the scientific name of a species refers to a taxonomical change or update since the species was listed on the Convention text. For example, *Pristis microdon* is considered a synonym of *Pristis pristis* (i.e., the same); *Mobula japanica* is a synonym of *Mobula mobular*; *Mobula eregoodootenke* is now known as *Mobula eregoodoo*; and *Mobula rochebrunei* is believed to be an invalid species and therefore not illustrated.

SHARKS AND RAYS ON CITES



Whale shark
Rhincodon typus



Basking shark
Cetorhinus maximus



Great hammerhead
Sphyrna mokarran



Scalloped hammerhead
Sphyrna lewini



Bigeye thresher
Alopias superciliosus



Pelagic thresher
Alopias pelagicus



Smooth hammerhead
Sphyrna zygaena



Great white shark
Carcharodon carcharias



Porbeagle shark
Lamna nasus



Common thresher
Alopias vulpinus



Oceanic whitetip shark
Carcharhinus longimanus



Silky shark
Carcharhinus falciformis



Shortfin mako
Isurus oxyrinchus



Longfin mako
Isurus paucus



Munk's pygmy devil ray
Mobula munkiana



Longhorned pygmy devil ray
Mobula eregoodoo *



Atlantic devil ray
Mobula hypostoma



Sicklefin devil ray
Mobula tarapacana



Bentfin devil ray
Mobula thurstoni



Shortfin devil ray
Mobula kuhlii



Oceanic manta
Mobula birostris *



Reef manta
Mobula alfredi *



Spinetail devil ray
Mobula mobular *



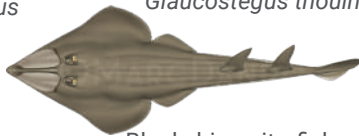
Sharpnose guitarfish
Glaucostegus granulatus



Clubnose guitarfish
Glaucostegus thouin



Halavi guitarfish
Glaucostegus halavi



Blackchin guitarfish
Glaucostegus cemiculus



Giant guitarfish
Glaucostegus typus



Widenose guitarfish
Glaucostegus obtusus



Largetooth sawfish
Pristis pristis *



Smalltooth sawfish
Pristis pectinata



Green sawfish
Pristis zijsron



Bottlenose wedgefish
Rhynchobatus australiae



Whitespotted wedgefish
Rhynchobatus djiddensis



Smoothnose wedgefish
Rhynchobatus laevis



African wedgefish
Rhynchobatus luebberti



Eyebrow wedgefish
Rhynchobatus palpebratus



Broadnose wedgefish
Rhynchobatus springeri



False shark ray
Rhynchorhina mauritaniensis



Bowmouth guitarfish
Rhina ancylostoma



Taiwanese wedgefish
Rhynchobatus immaculatus



Clown wedgefish
Rhynchobatus cooki



Dwarf sawfish
Pristis clavata



Narrow sawfish
Anoxypristis cuspidata

ABOUT THIS GUIDE

The development of this guide was made possible with the support of the Wildlife Conservation Society (WCS) in collaboration with the Centre for Environment, Fisheries and Aquaculture Science (Cefas), through funding from the Shark Conservation Fund and the UK Government. The Shark Conservation Fund is a philanthropic collaborative pooling expertise and resources to meet the threats facing the world's sharks and rays. The Shark Conservation Fund is a project of Rockefeller Philanthropy Advisors.

Information on key morphological characters used in this guide (e.g., size, shape and positions of dorsal and anal fins, conspicuous coloration patterns on fins or elsewhere along the body, body shape) were assessed for consistency within species and variations across the Indian Ocean region using photographs supplied by colleagues, published in the literature, and online. Photographs from the field were collected at various field sites around the world by the lead author (Rima Jabado), provided by Daniel Fernando

of Blue Resources Trust and his team working in Sri Lanka (bottlenose wedgefish, *Rhynchobatus australiae*; bowmouth guitarfish, *Rhina ancylostoma*; shortfin mako, *Isurus oxyrinchus*; longfin mako, *I. paucus*; silky shark, *Carcharhinus falciformis*; oceanic whitetip shark, *C. longimanus*; scalloped hammerhead shark, *Sphyrna lewini*; bentfin devil ray, *Mobula thurstoni*), and Ali Hood from The Shark Trust (basking shark, *Cetorhinus maximus*). We are extremely grateful for their support.

Special thanks to Ryan Charles, Chelsea Stein, and Daniel Fernando for providing constructive review.

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As fisheries, customs, and wildlife officers, you can help protect sharks and rays by actively enforcing trade controls and fisheries regulations in your country. Provisional identification of full carcasses from CITES-listed sharks and rays leads to establishing reasonable or probable cause in an enforcement setting (e.g., detaining catches from a vessel suspected of harvesting these species if prohibited nationally; landings containing products from CITES-listed species and auctioned at fish markets).

This guide forms part of a three-volume series of identification guides: Volume I – Full Carcass ID, Volume II – Processed Carcass ID, and Volume III – Dried Product ID. Each of these guides has been produced with support by WCS and Cefas. They have been designed to follow a similar simple structure to guide users with no previous knowledge of sharks and rays with identification of whole carcasses or different derivative products.

This **Full Carcass ID** guide uses a flow chart format, illustrations, and descriptions of the key features that can be quickly used to easily distinguish whole carcasses of CITES-listed species from non-listed species during routine inspections. Improved identification to the species level will lead to improved understanding, better data collection, and ultimately enhanced protection for sharks and rays. This is an important step in implementing the provisions of CITES for sharks and rays, thus preventing illegal and unsustainable trade.

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