

CITES SHARKS AND RAYS

Implementing and enforcing listings -- VOLUME III



DRIED PRODUCT ID

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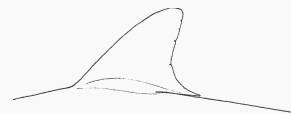
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CONTENTS

Why this guide?	6
Background	6
Purpose of this guide?	7
How to use this guide?	8
Anatomy	10
Colouration	12
Glossary	13
Section 1 -- Identifying Shark and Ray Fins	14
Distinguish dorsal fins from pectoral fins and caudal fins	20
Distinguish dorsal fins from CITES-listed species	26
Distinguish pectoral fins from CITES-listed species	38
Distinguish shark caudal fins from wedgefish and giant guitarfish	48
Confirm species	52
Section 2 -- Identifying Sawfish Rostra	76
Section 3 -- Identifying Manta and Devil Ray Gill Plates	79
Sharks, Rays, and CITES	82
Sharks and rays	82
What is CITES?	82
Sharks and rays on CITES	84
About this guide	86
Guidance documents	87



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 for visual fin, gill plate, and sawfish rostra identification information for all CITES-listed shark and ray species to be in one easy to use guide.

To identify and address challenges of detecting illicit trade in protected or CITES-listed sharks and rays, the Wildlife Conservation Society (WCS) has been working to build capacity of countries to implement 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 parts derived from sharks and rays can sometimes pose a significant challenge in implementing fisheries and trade 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, Volume II – Processed Carcass ID, and Volume III -- Dried Product ID [*this guide*]. 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 **Dried Product ID** guide was created to enable wildlife inspectors and enforcement personnel to provisionally identify fins, rostra, and gill plates derived from commercially traded **shark and ray species listed in Appendix I and II of CITES**. This identification is based on morphological characteristics of their most distinctive fins (dorsal, pectoral and/or caudal), dried rostra (family Pristidae, sawfishes), and gill plates in their commonly traded form (frozen and/or dried and unprocessed). This preliminary visual identification will establish reasonable or probable cause in enforcement contexts so that expert opinion can be sought, or genetic testing can confirm field identification. This will aid governments in successfully implementing and enforcing CITES listings and promoting legal, sustainable trade.

Note on potential limitations for using this field guide: The first section of this guide focuses on visual identification methods of raw, unprocessed fins for both shark and shark-like ray species (wedgetfishes (family Rhinidae), giant guitarfishes (family Glaucostegidae), and sawfishes (family Pristidae)), in wet or dried form. Pectoral fins derived from wedgetfish, giant guitarfish, and sawfish are not covered since these are usually consumed locally, rarely found in international trade, and require genetic assays for identification to the species level. Additionally, lower caudal lobes derived from sharks are not covered due to a lack of morphological features (fin origin, fin insertion, or free rear tip) to allow for reliable visual identification of all CITES-listed species. For fins covered in this guide but that are heavily processed, genetic assays must be used for identification to the genus or species level. Overall, while this guide highlights general information regarding the key morphological characteristics of fins CITES-listed species, there are a few important caveats to consider that may impede identification to the species level.

1. **Curling upon drying** -- many large-sized fins (especially pectoral fins from thresher sharks (*Alopias* spp.)) might change forms after the drying process and might no longer be easily identifiable. Once dry, fins are difficult to mould back into their original shape, however, their coloration will remain.
2. **Fin cut** -- there are several ways in which fins can be cut by fishers and/or traders (half moon, straight, and variations in between) which might make it difficult to determine some key diagnostic features like fin origin, fin insertion, and presence or length of the free rear tip. For these fins, it would be better to use genetic approaches to confirm identification.
3. **Color** -- depending on the drying methods used including sun drying, salting and drying, or mechanical drying, variations in colors might occur. Generally, with sun drying and salting, the colors on the fins (black or white) will fade away but are likely to still be visible. On the other hand, oven drying tends to darken the fin colors.
4. **Inconsistent coloration** -- some species might show intra-specific variations in the coloration of their fins depending on their life-history stage (juveniles compared to adults). For example, the blacktip shark (*Carcharhinus limbatus*) does not always have a black spot on the apex of the first dorsal fin while the grey reef shark (*C. amblyrhynchos*) often has a white margin on the trailing edge of its first dorsal fin in some regions of the Indian Ocean.

Information on gill plates is only provided for dried forms and at the genus level. It is important to note that although they look different when fresh, the same diagnostic features provided for the dried forms can be used by inspectors and wildlife personnel to differentiate them. Overall, in law enforcement contexts, the use of this guide provides the information needed for establishing probable cause to hold shipments unaccompanied by the appropriate CITES permits so that expert opinion can be sought or genetic testing can be conducted to confirm field identification.

How to use this guide

This guide is organized in three sections. The first section is focused on identification of first dorsal fins, pectoral fins, and caudal fins of sharks and shark-like rays. There are five color-coded steps to navigating this fin identification section:

STEP 1

Distinguish **dorsal fins** from other highly-valued fins: pectoral fins and lower caudal lobes.

STEP 2

Distinguish **dorsal fins** from CITES-listed species.

STEP 3


Distinguish **pectoral fins** from CITES-listed species.

STEP 4

Distinguish **sawfish caudal fins** from those derived from wedgefish and giant guitarfish.

STEP 5

Use **species identification pages** to confirm type of fins and species.

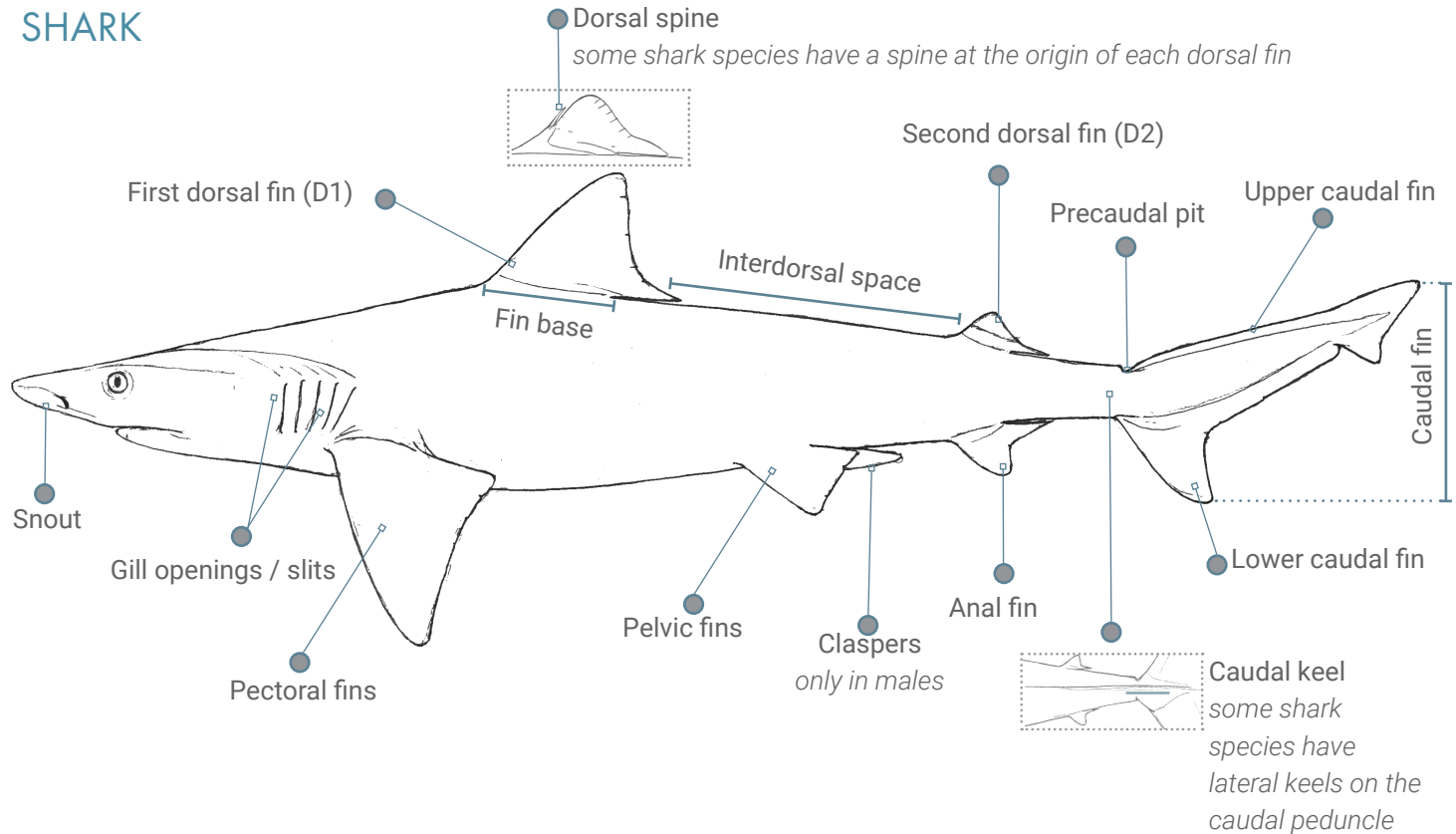
The first four steps are in the form of flowcharts so that fins can be systematically identified to the appropriate genus or species and readers can be guided to the relevant page. These flow charts are set up to ask a series of statements consisting of two choices, either **Yes** or **No**, that describe key characteristics that are seen on fins. These features can be used to quickly and easily distinguish CITES Appendix I and II listed species from non-CITES-listed species during routine inspections. A red hand () in the flowchart indicates that the fin is not from a species covered in this guide (i.e., not a CITES-listed species). For fins that are difficult to identify or might be confused with other species, comparison pages after each step are provided to showcase similar looking fins and provide details on how to separate them. The fifth step here consists of confirming species identification by reviewing the species-specific pages where a full description of each type of fin is provided.

The second section of this guide is focused on the identification of sawfish rostra. Descriptions are provided for each of the five species based on the position of the rostral teeth and their numbers on each side of the saw. Finally, the third section of this guide is focused on the identification of gill plates to distinguish between those of manta rays and devil rays (*Mobula* spp.).

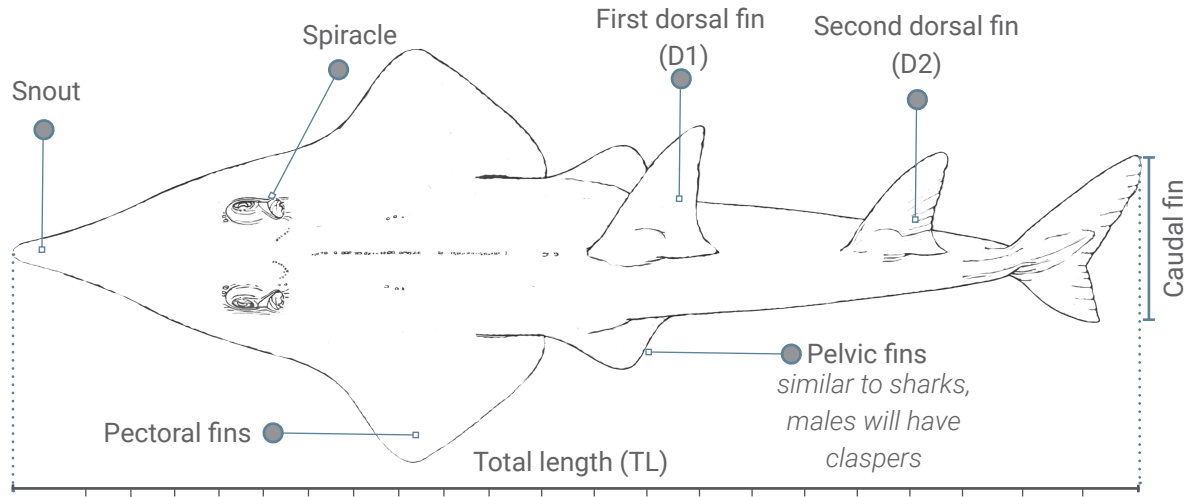
ANATOMY

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

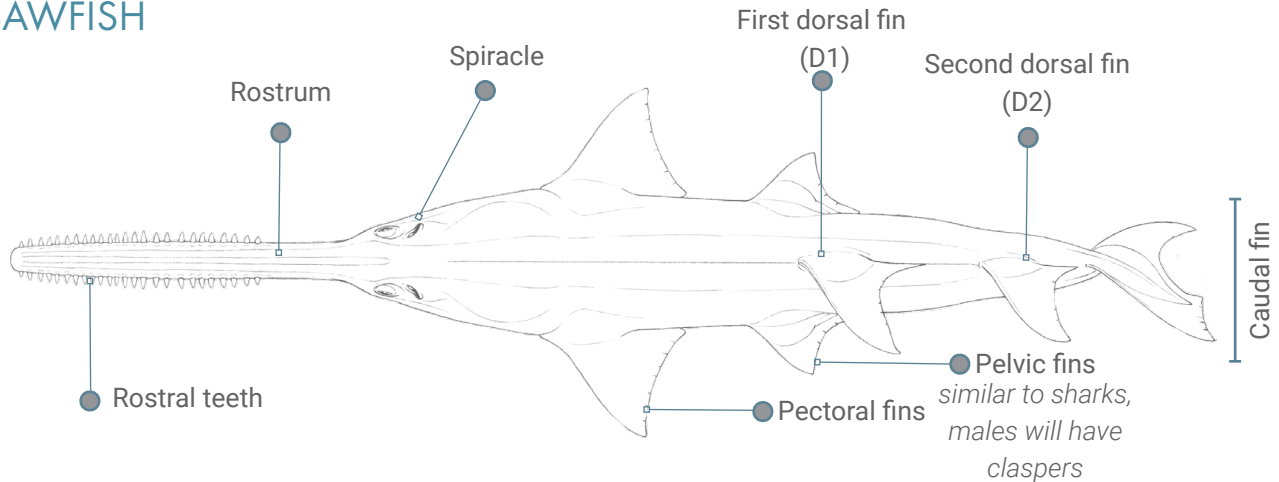
SHARK



WEDGEFISH / GIANT GUITARFISH



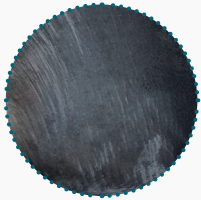
SAWFISH



COLORATION

Several terms are used to refer to markings on the fins. The following images illustrate what the different colors refer to. When referring to pectoral fins, the term 'dusky' refers to markings that are slightly greyish or dark but diffuse in color with no stark demarcation between the white or light coloration on the ventral surface. The term 'black' refers to markings that are dark (inky black) in color with a stark demarcation between the white or light coloration on the ventral surface.

Dorsal fin colors



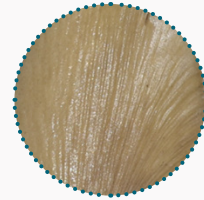
Slate grey



Light grey



Brown



Yellowish

Pectoral fin apex colors



Dusky



Dusky margins



Black



No markings

GLOSSARY

angular – forming an angle; sharp-cornered.

apex – the top or highest point.

ceratotrichia – fin rays or fin needles found inside fins and made of soft collagen and elastin fibres.

concave – curved inwards (opposite of convex).

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

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

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

dorso-ventrally compressed – flattened from top to bottom.

dusky – slightly dark or greyish color diffusion with no stark demarcation.

falciform – curved like a sickle; hooked.

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

gill plates – ring of feathery cartilaginous gill filaments (known as prebranchial appendages) which circle manta and devil ray gill slits internally.

lamnid – shark species from the Family Lamnidae (e.g., porbeagle (*Lamna nasus*), shortfin mako (*Isurus oxyrinchus*), great white (*Carcharodon carcharias*))

laterally compressed – flattened from side to side.

margin – edge or border of the body or fin.

notched – an indentation, in this case on the rear edge of a fin.

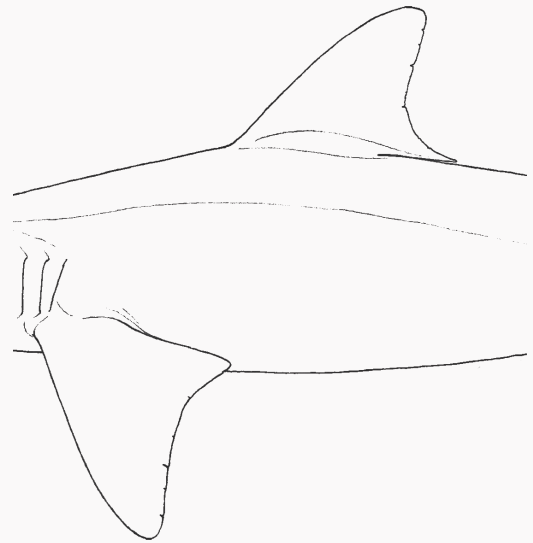
ragged – having a torn, irregular or uneven surface, edge, or outline.

rostrum – a projecting snout.

ventral – related to the underside of body.

SECTION 1

IDENTIFYING SHARK AND RAY FINS



SPECIES COVERED

This section focuses on identifying unprocessed first dorsal fins, paired pectoral fins, and whole caudal fins from the following commercially-exploited species that are traded internationally for their fins.

EASILY IDENTIFIED BY THEIR FIRST DORSAL FINS AND/OR PECTORAL FINS

- Oceanic whitetip shark (*Carcharhinus longimanus*)
- Silky shark (*Carcharhinus falciformis*)
- Scalloped, great, and smooth hammerhead (*Sphyrna lewini*, *S. mokarran*, *S. zygaena*)
- Porbeagle (*Lamna nasus*)
- Great white shark (*Carcharodon carcharias*)
- Basking shark (*Cetorhinus maximus*)
- Whale shark (*Rhincodon typus*)

EASILY IDENTIFIED BY THEIR PECTORAL FINS

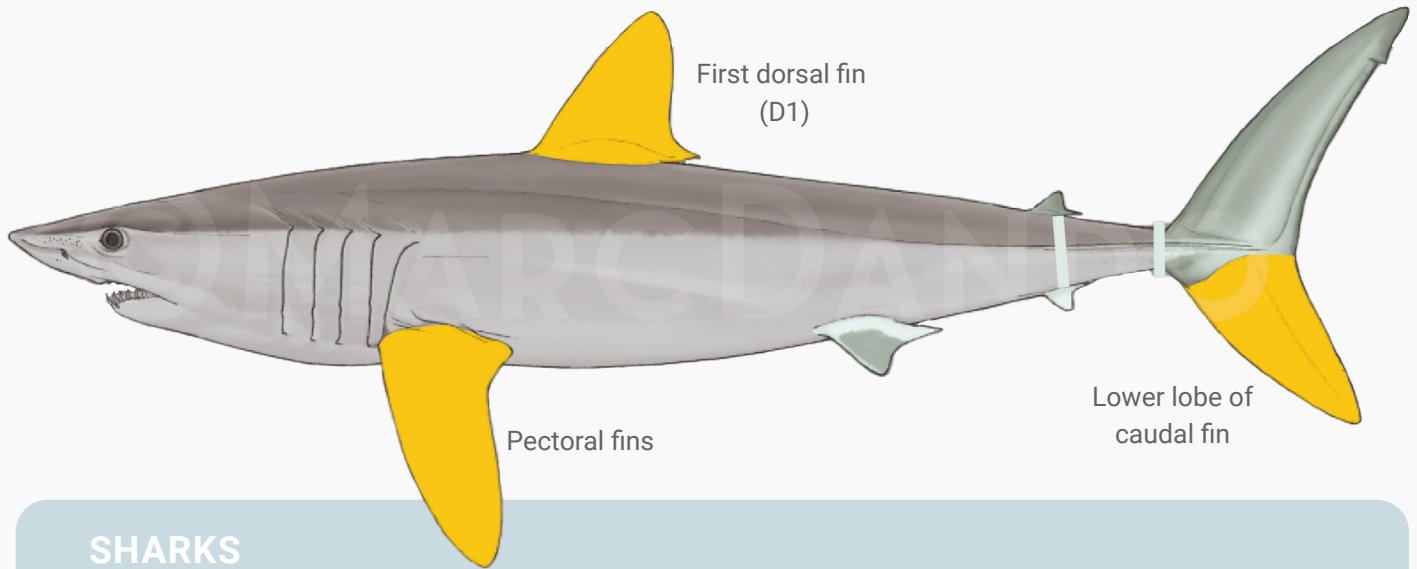
- Bigeye, common, and pelagic thresher (*Alopias superciliosus*, *A. vulpinus*, *A. pelagicus*)
- Shortfin and longfin mako (*Isurus oxyrinchus* and *I. paucus*)

EASILY IDENTIFIED BY THEIR FIRST AND SECOND DORSAL FINS, AND/OR WHOLE CAUDAL FIN

- Wedgefishes (Rhinidae) 10 species
- Giant guitarfishes (Glaucostegidae) 6 species
- Sawfishes (Pristidae) 5 species

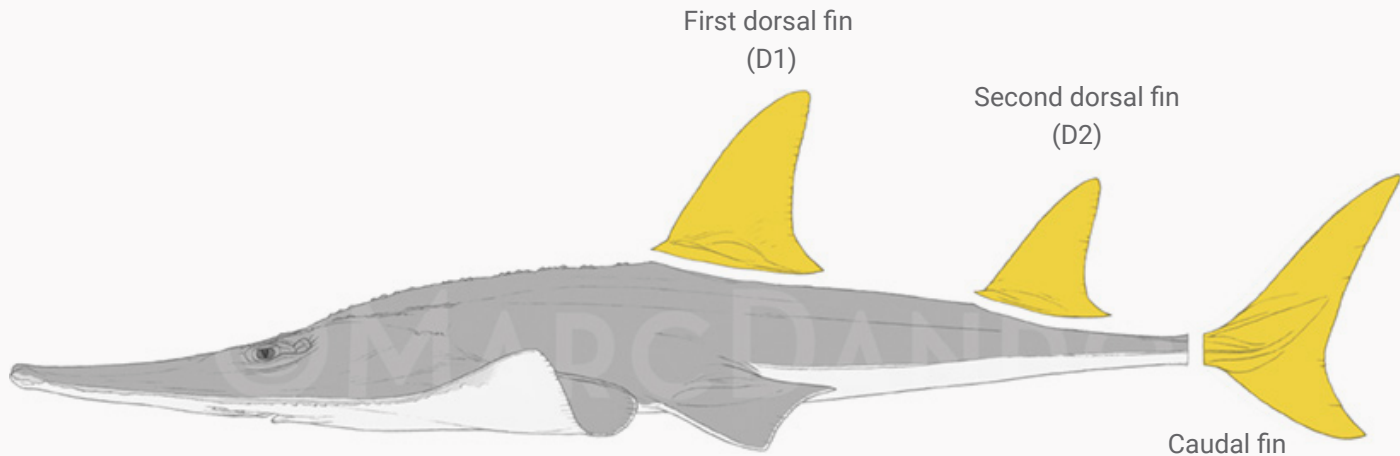
TRADED FINS

These images show the positions of the primary fin types that are highly prized in trade and used for shark fin soup for sharks and shark-like rays (sawfishes, wedgefishes, and giant guitarfishes -- see next page).



SHARKS

The **first dorsal fin**, **paired pectoral fins**, and **lower lobe of the caudal fin** (in yellow) are the primary fins traded, often together as a set. The upper caudal lobe is typically discarded but may be retained for the cartilage. Second dorsal fins derived from sharks, paired pelvic fins, anal fins, and upper caudal lobes also occur in trade but are less valuable than primary fins used to make shark fin soup.



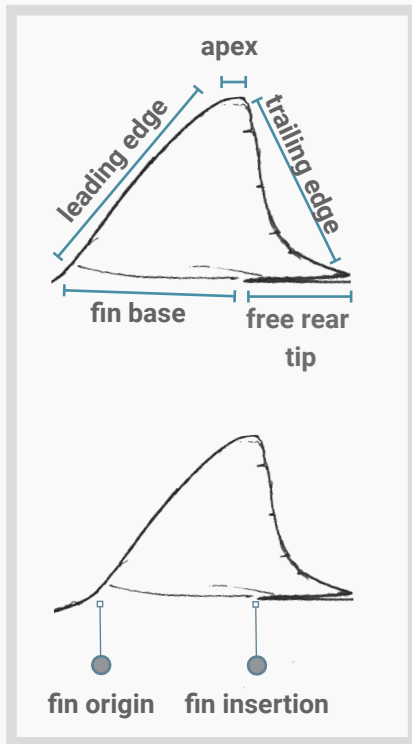
SAWFISHES, WEDGEFISHES, AND GIANT GUITARFISHES

The **first dorsal fin**, **second dorsal fin** and the **whole caudal fin** (in yellow) are the primary fins traded, often together as a set. Pectoral fins are often consumed or traded locally and sometimes internationally for meat. However, pectoral fins are not used to make shark fin soup.

FIN LANDMARKS

The landmarks used to describe key features of each fin type are the same for consistency and ease of use. For sharks, only the lower caudal fin is usually traded whereas for sawfishes, wedgefishes, and giant guitarfishes, the whole fin is traded. (*only pectoral fins of sharks are covered in this guide since fins of shark-like rays look different.)

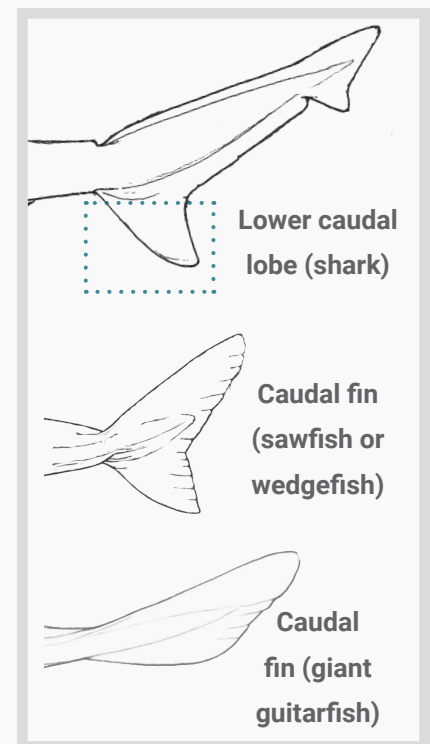
Dorsal fins



Pectoral fins*



Caudal fin



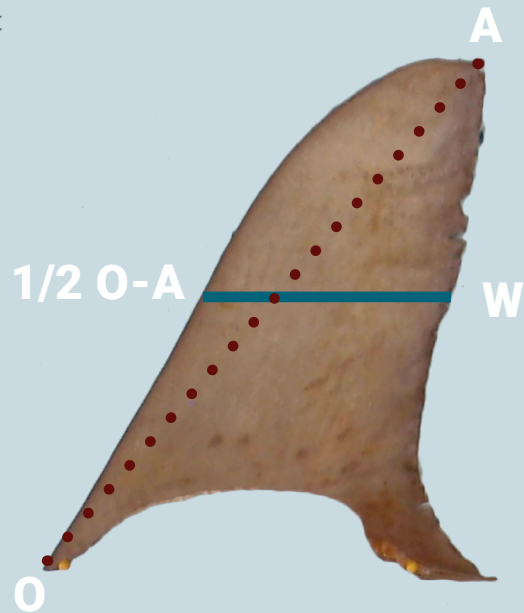
TAKING FIN MEASUREMENTS

Some dorsal fins can be distinguished by determining if they are 'tall' or 'short'. Fins are considered 'tall' if the ratio calculated is **over 2.5** and 'short' if the ratio is **less than 2.5**. Below are the steps to follow to calculate ratios.

The origin (O), apex (A), and fin width (W) (measured from leading edge to trailing edge) are the three landmarks most useful for species identification purposes. Measurements based on fin height, fin base, and free rear tip are often too variable and dependent on the cut and condition of the fin.

STEPS

- 1) Measure fin origin to apex (O-A) with a flexible tape measure.
- 2) Measure the fin width (W) at the halfway point of O-A (i.e., if O-A is 10 cm, measure W at 5 cm along O-A).
- 3) Divide O-A by W ($O-A/W$).



STEP 1: Distinguish dorsal fins from pectoral fins and caudal fins

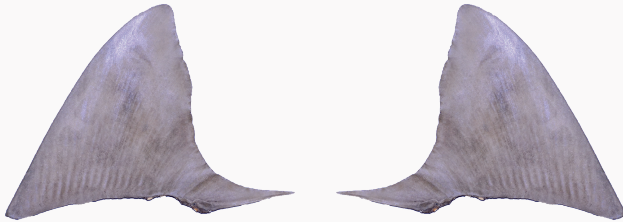
A. CHECK THE FIN COLOR ON EACH SIDE

Dorsal fins and intact caudal fins from shark and shark-like rays are the same color on both sides (see right and left side views on next page). In contrast, pectoral fins are darker on the top side (dorsal view) and lighter underneath (ventral view), also known as countershading.

Note -- Pectoral fins destined for the fin trade are derived from sharks, not shark-like rays (sawfishes, wedgefishes, giant guitarfishes) and are not covered in this guide.

- If the fin is a **dorsal fin**, go to Step 2 (see page 26).
- If the fin is a **pectoral fin**, go to Step 3 (see page 38).
- If you have a fin that is an **intact caudal fin**, go to Step 4 (see page 48).

Dorsal fins



Left side

Right side

Caudal fins (intact)



Left side

Right side

Pectoral fins

Dorsal view (top)



Ventral view (underneath)



Second row of pictures: *Thresher shark pectorals have a ventral surface that is only slightly lighter in color than the dorsal surface. However, there is still a detectable difference between the two sides of the fin.*

STEP 1: Distinguish dorsal fins from lower caudal lobes

B. CHECK THE BASE OF THE FIN

Like dorsal fins, the lower lobe of the caudal fin is the same color on both sides. However, when detached from the upper caudal lobe, the fin base looks quite different compared to the fin base of a dorsal fin.

Dorsal fins (D) have a continuous row of closely spaced cartilaginous blocks running along almost the entire fin base. When looking at a cross section of the base of a lower caudal lobe (LC1), there is typically only a yellow, 'spongy' material called *ceratotrichia*, which is the material used in shark fin soup. In some lower caudal lobes (LC2), there may be a row of the cartilaginous blocks present, but they are usually irregular in shape, widely spaced and/or occur only along part of the fin base.

Dorsal fins frequently have a free rear tip that is fully intact. In contrast, the lower caudal lobe has no free rear tip (although a cut with the trailing edge of the upper lobe intact may look like a free rear tip).

Note -- Lower caudal lobes derived from sharks are not covered in this guide due to a lack of morphological features to allow for reliable visual identification of all CITES-listed species.

Fin base

Dorsal fins (D)



Lower caudal lobe (LC1)



Lower caudal lobe (LC2)



Free rear tip

Dorsal fins (D)



Lower caudal lobe (LC1)



Lower caudal lobe (LC2)



STEP 1: Distinguish dorsal fins from lower caudal lobes

B. CHECK THE BASE OF THE FIN

When checking the fin base, keep in mind that dorsal fins derived from sharks will have a continuous row of cartilage of similar size and shape running across the entire fin base. On the other hand, dorsal fins derived from sawfishes, wedgefishes, and giant guitarfishes will vary (depending on cut) with multiple, irregularly shaped rows of cartilage or two long strips of cartilage.

Shark first dorsal fin bases



Hammerhead shark (*Sphyrna* spp.)



Hammerhead shark (*Sphyrna* spp.)



Thresher shark (*Alopias* spp.)

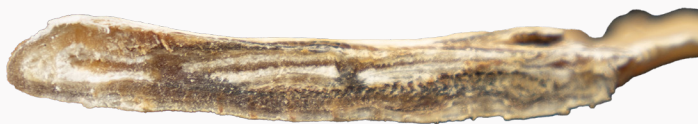
Sawfish, wedgefish, and giant guitarfish first dorsal fin bases



Wedgefish (*Rhynchobatus* spp.)



Bowmouth guitarfish (*Rhina ancylostoma*)



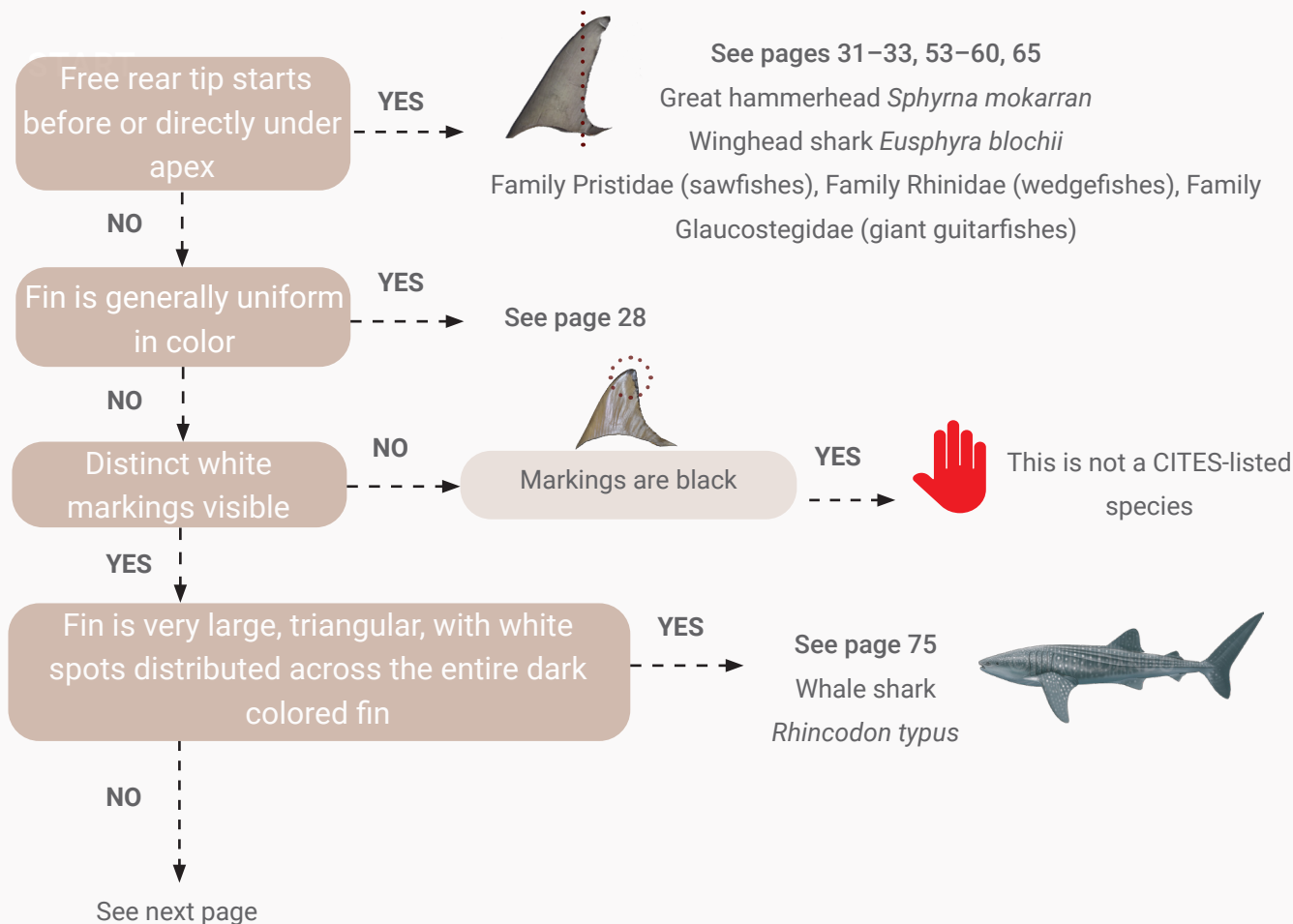
Giant guitarfish (*Glaucostegus* spp.)

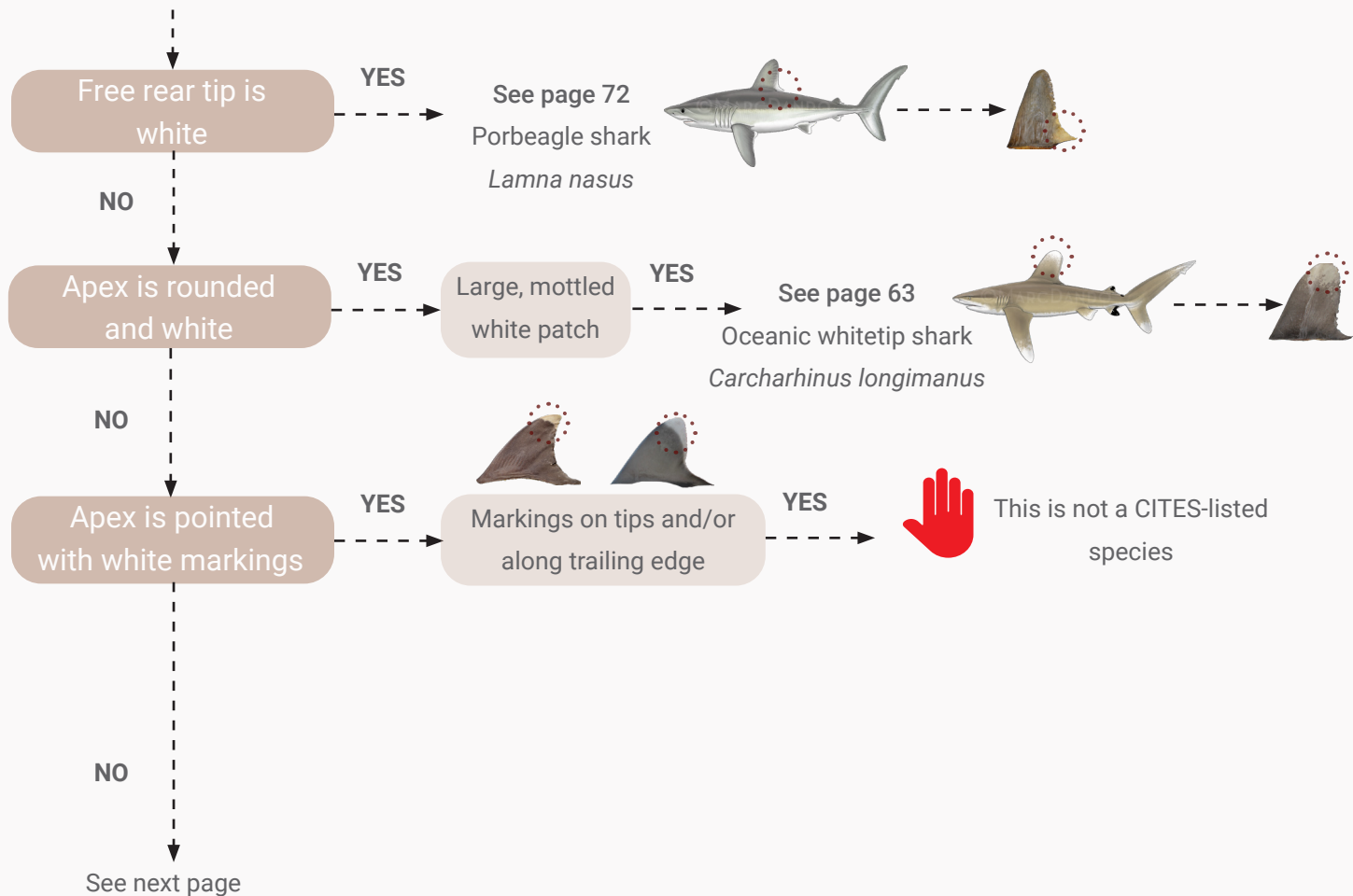


Narrow sawfish (*Anoxypristis cuspidata*)

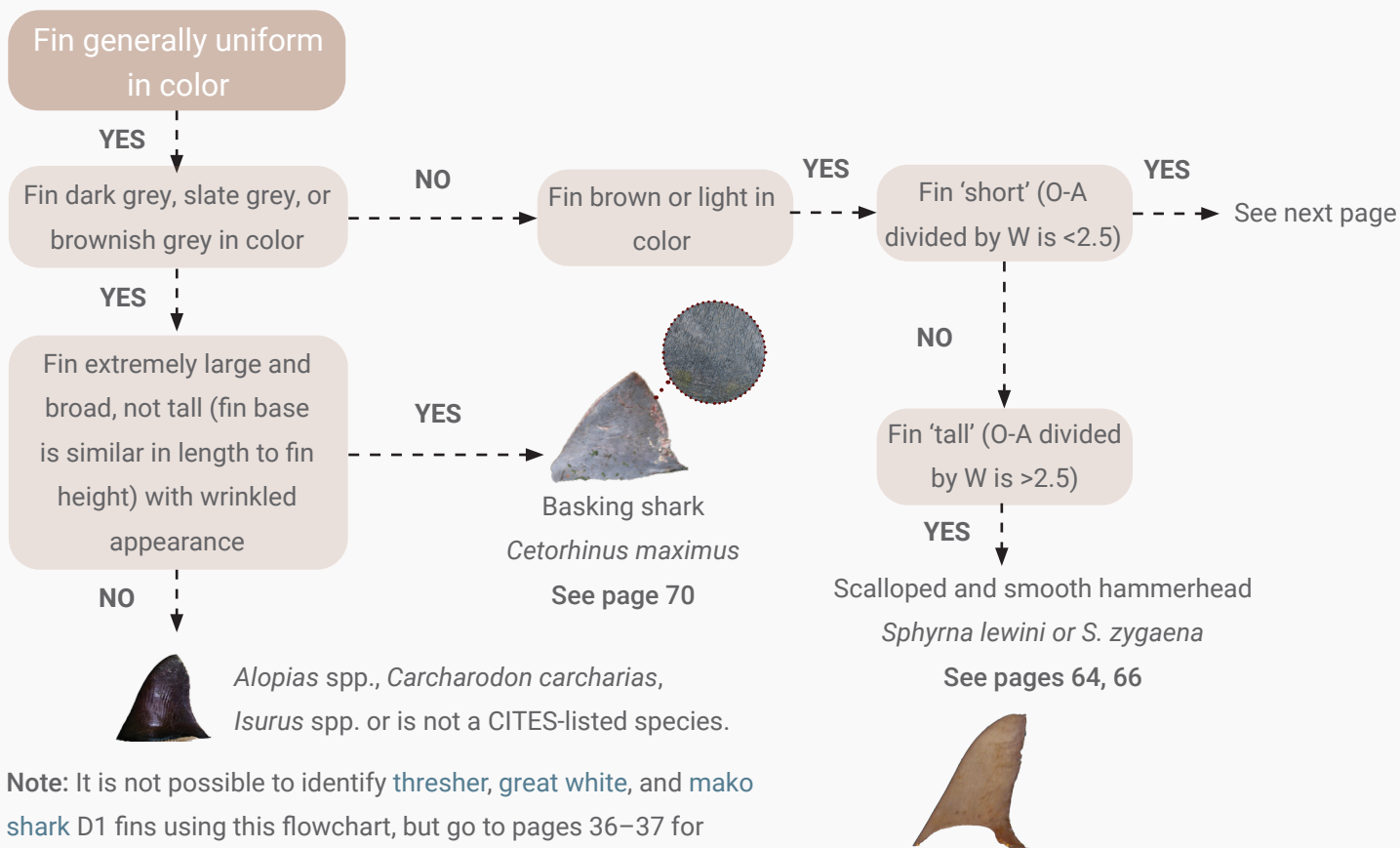
Smalltooth sawfish (*Pristis pectinata*)

STEP 2 -- Distinguish dorsal fins from CITES-listed species





STEP 2 -- Distinguish dorsal fins from CITES-listed species (*continued*)



Note: It is not possible to identify **thresher**, **great white**, and **mako shark** D1 fins using this flowchart, but go to pages 36–37 for comparisons. The key diagnostic feature for visually identifying these species is on the pectoral fins. Go to Step 3 or see pages 42–43.



Comparing silky shark first dorsal fins with first dorsal fins of similar size, shape, and color

Because the commonly traded first dorsal fins from non-CITES-listed species also have a convex trailing edge, it is helpful to compare those species to first dorsal fins from the silky shark.



Silky shark (*Carcharhinus falciformis*)

- Uniform grey or greyish-brown in color
- Sloping leading edge
- Moderately rounded (as opposed to pointed) apex
- Convex (outwardly rounded) trailing edge
- Free rear tip is close to half the length of the base



Dusky shark (*Carcharhinus obscurus*)

- Narrowly rounded at the apex
- Not as strongly convex (outwardly rounded) trailing edge
- Shorter free rear tip



Blue shark (*Prionace glauca*)

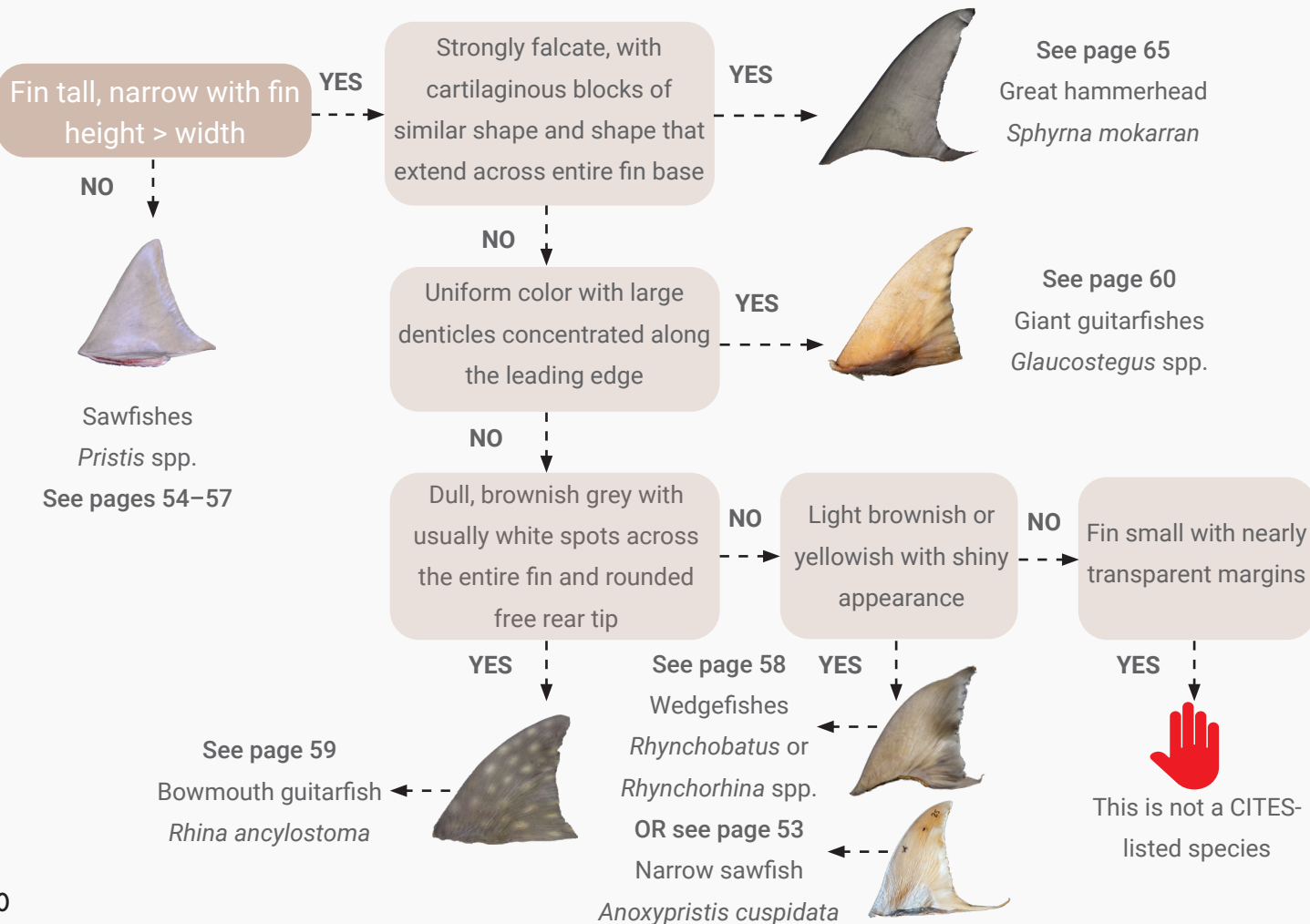
- Noticeably darker in color
- Low angular leading edge
- Much more strongly convex trailing edge



Night shark (*Carcharhinus signatus*)

- More convex (outwardly rounded) trailing edge
- Shorter free rear tip

STEP 2 -- Distinguish dorsal fins from CITES-listed species (*continued*)

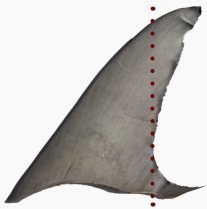


COMPARING HAMMERHEAD FIRST DORSAL FINS WITH OTHER FINS

OTHER NON-CITES-LISTED HAMMERHEAD FINS

Great hammerhead (*Sphyrna mokarran*) first dorsal fins may be difficult to distinguish from those of the winghead shark (*Eusphyra blochii*). First dorsal fins from both species have a similar light grey coloration, are strongly falcate, with cartilaginous blocks of similar shape and shape that extend across entire fin base, and a free rear tip that starts before the apex (see below). However, winghead sharks are only found in a few countries (e.g., India, Thailand, Indonesia, Papua New Guinea, and Northern Australia) and are extremely rare in trade. Globally, first dorsal fins with this shape are much more likely to be from the great hammerhead than the winghead shark.

Similarly, small to moderate sized first dorsal fins (juvenile animals) from the scalloped and smooth hammerheads (*S. lewini* and *S. zygaena*) may be difficult to distinguish from those from the bonnethead shark (*S. tiburo*), small eye hammerhead (*S. tudes*), scoophead shark (*S. media*) and scalloped bonnethead (*S. corona*), which are non-CITES-listed hammerhead species (see below). It may be necessary to verify species ID using genetic approaches.



Great hammerhead
(*Sphyrna mokarran*)



Winghead shark
(*Eusphyra blochii*)



Scalloped hammerhead
(*Sphyrna lewini*)



Scalloped bonnethead
(*Sphyrna corona*)

COMPARING HAMMERHEAD FIRST DORSAL FINS WITH OTHER 'TALL' FINS

WEDGEFISH AND BLACKTIP SHARKS

Dorsal fins that are tall and slender and dull brown or light grey are probably one of three species of hammerhead sharks: great (*Sphyrna mokarran*), scalloped (*S. lewini*) or smooth (*S. zygaena*). Fin descriptions for these three species can be found on pages 64–66.

Tall dorsal fins can also come from several species of **wedgefish** or **blacktip sharks**. In wedgefish dorsal fins, cartilaginous blocks do not extend across the entire fin base. In hammerheads, these cartilaginous blocks are present along almost the entire fin base (see Step 1-B pages 24–25).

Wedgefish dorsal fins (except for the bowmouth guitarfish *Rhina ancylostoma*), also exhibit a glossy sheen, and some species have white spots at the fin base, unlike the dull brown, uniform coloration of hammerhead dorsal fins (Images A - next page).

Some blacktip sharks (*Carcharhinus limbatus*) first dorsal fins exhibit fin height to width ratio (O-A/W) that is close to or slightly greater than 2.5. However, they often (but not always) have a black spot on the dorsal fin apex, and the fin has a glossy appearance compared to the dull look of hammerhead first dorsal fins (Images B - next page).

Dorsal fins and pectoral fins are often traded together as a set. Pectoral fins from blacktip sharks have a glossy appearance and are longer and more slender than the dull, short, broad pectoral fins of hammerheads (Images C - next page).

A. Dorsal fin color and texture



Wedgefish (*Rhynchobatus* spp.)
first dorsal fin

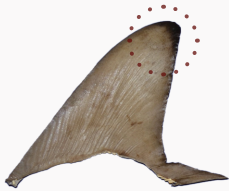


Wedgefish (*Rhynchobatus* spp.)
second dorsal fin



Scalloped hammerhead (*Sphyrna lewini*) first dorsal fin

B. First dorsal fin height/width ratio



Blacktip shark (*Carcharhinus limbatus*)



Scalloped hammerhead (*Sphyrna lewini*)

C. Pectoral fins



Blacktip shark
(*Carcharhinus limbatus*)



Scalloped hammerhead
(*Sphyrna lewini*)

COMPARING HAMMERHEAD FIRST DORSAL FINS WITH OTHER 'TALL' FINS

MAKO AND THRESHER SHARKS

First dorsal fins from mako (*Isurus oxyrinchus* and *I. paucus*), thresher (*Alopias* spp.), and hammerhead (*Sphyrna* spp.) sharks are tall and slender from leading to trailing edge.

Mako and thresher fins are slate to dark grey in colour (Images A - next page).

Great hammerhead first dorsal fins have a distinctive curved shape and are a much lighter grey than mako or thresher fins (Images B - next page).

Scalloped and smooth hammerhead first dorsal fins are similar in shape to the dorsal fins of mako and thresher sharks, but they are much lighter in colour and are usually light brown instead of grey (Images C - next page).

Scalloped and smooth Hammerhead D1 are very similar and often extremely hard to differentiate. However, it is not uncommon for valuable fins from an individual to be traded as a set (D1, paired pectoral fins, and lower caudal lobe). If this is the case, the two species can be distinguished using the pectoral fins.

A. Mako and thresher first dorsal fins



Shortfin mako
(*Isurus oxyrinchus*)



Bigeye thresher
(*Alopias superciliosus*)



Pelagic thresher
(*Alopias pelagicus*)

B. Great hammerhead first dorsal fin



Great hammerhead
(*Sphyrna mokarran*)

C. Scalloped and smooth hammerhead first dorsal fins



Scalloped hammerhead
(*Sphyrna lewini*)



Smooth hammerhead
(*Sphyrna zygaena*)

COMPARING MAKO SHARK FIRST DORSAL FINS WITH OTHER 'TALL' FINS

FAMILY LAMNIDAE AND ALOPIIDAE

First dorsal fins for both the shortfin (*Isurus oxyrinchus*) and longfin (*I. paucus*) mako sharks are morphologically similar in size, shape, and coloration at all life stages (Images A - below).

First dorsal fins from porbeagle (*Lamna nasus*), salmon (*L. ditropis*), and great white (*Carcharodon carcharias*) sharks are also uniform dark slate grey (wet) or greyish-brown (dried, semi-dried) in color; tall and very erect due to the steep angle of the leading edge (Images B - see next page).

First dorsal fins originating from the three species of thresher sharks (*Alopias* spp.) look similar and can be mistaken for first dorsal fins originating from mako sharks (Images C - next page). First dorsal fins from the blue shark are similar in color. However, they are not tall and have a low sloping edge, a moderately rounded apex (outwardly pointed) and a longer free rear tip than seen in first dorsal fins from porbeagle, salmon, great white, and thresher sharks (see page 29).

A. Mako first dorsal fins

- Uniform, dark slate grey (wet) or greyish-brown (dried, semi-dried) in color
- Tall, very erect fin due to the steep angle of the leading edge
- Moderately rounded apex, and nearly straight trailing edge
- Short free rear tip



Shortfin mako
(*Isurus oxyrinchus*)



Longfin mako
(*Isurus paucus*)

B. Porbeagle, salmon, and great white shark first dorsal fins (D1)



Porbeagle shark
(*Lamna nasus*)

D1 fin with very distinctive white patch on the free rear tip not seen in any other species of shark.



Salmon shark
(*Lamna ditropis*)

D1 much broader (leading edge to trailing edge). Apex also more broadly rounded than mako shark D1 fins.



This is not a
CITES-listed
species



Great white shark
(*Carcharodon carcharias*)

D1 leading edge flattens out at the moderately pointed apex. Trailing edge slightly concave, often with ragged appearance.

C. Thresher shark first dorsal fins



Pelagic thresher
(*Alopias pelagicus*)

D1 fins dark and broad. Bigeye thresher D1 fin have visible striations that are absent in Pelagic thresher dorsal fins.



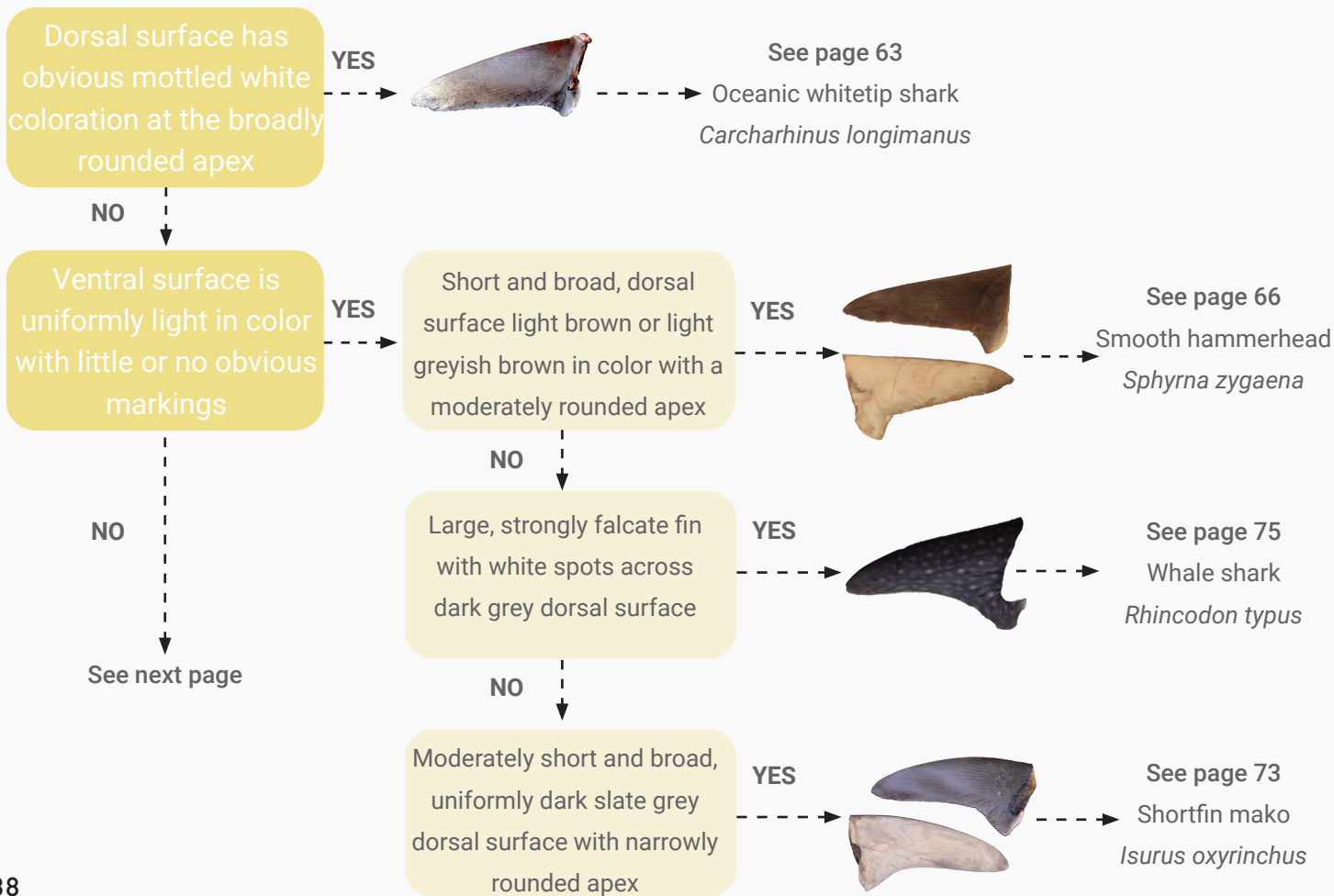
Bigeye thresher
(*Alopias superciliosus*)

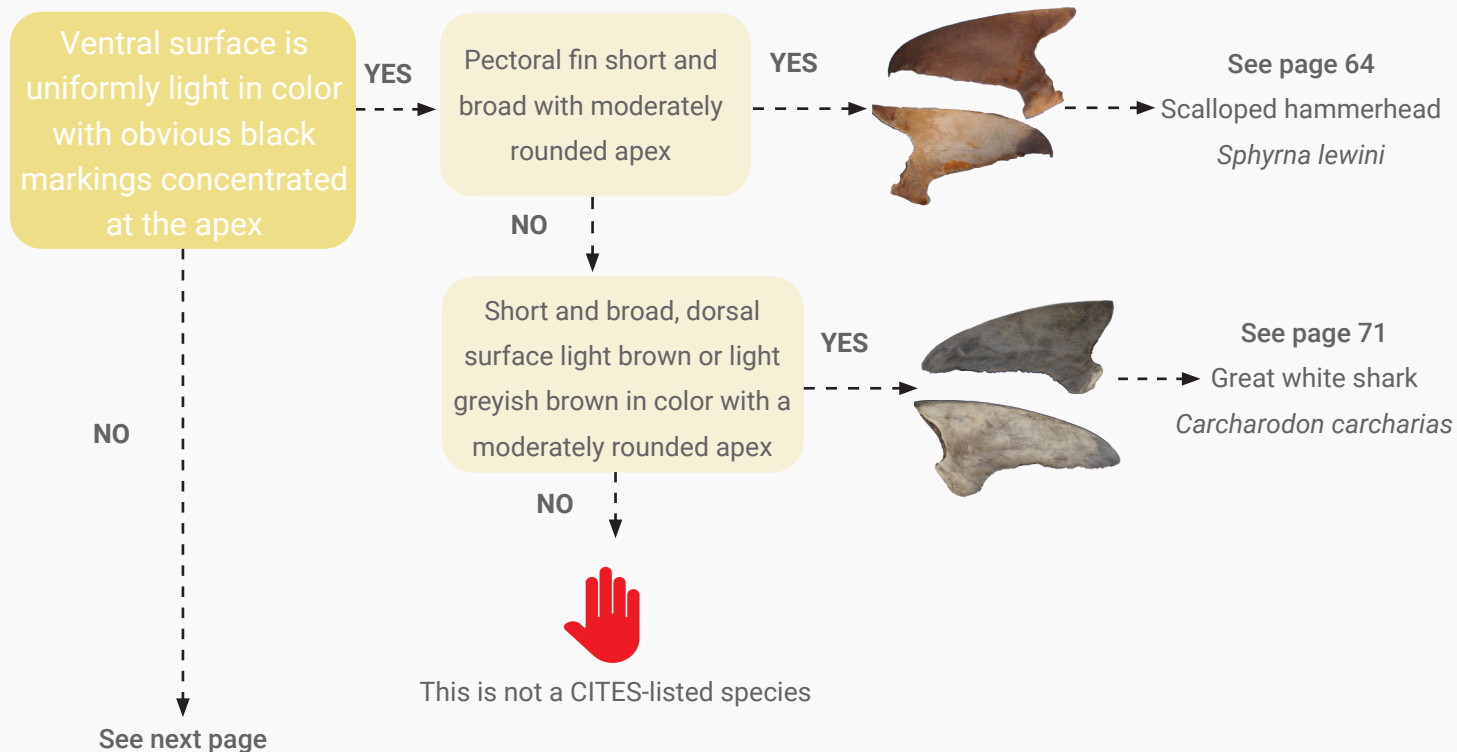


Common thresher
(*Alopias vulpinus*)

D1 fin typically tall and light grey in colour.

STEP 3 -- Distinguish pectoral fins from CITES-listed species





This is not a species covered in this guide.
(see pages 44–45 for descriptions of pectoral fins from non-CITES-listed species with obvious black coloration on ventral surface).

STEP 3 -- Distinguish pectoral fins from CITES-listed species

Ventral surface is generally light in color with dusky markings concentrated at the apex

YES

Dorsal surface light greyish brown in color; fin short and broad along the base but tapering to a strongly pointed apex; falcate trailing edge

YES



See page 65

Great hammerhead
Sphyrna mokarran

NO

Dusky markings concentrated at apex and diffusing along less than 1/3 of the trailing edge of the ventral surface; dorsal surface is brown or greyish

YES



See page 62

Silky shark
Carcharhinus falciformis

NO

Dusky markings concentrated at the apex and diffusing along more than 1/3 of the trailing edge of the ventral surface

NO

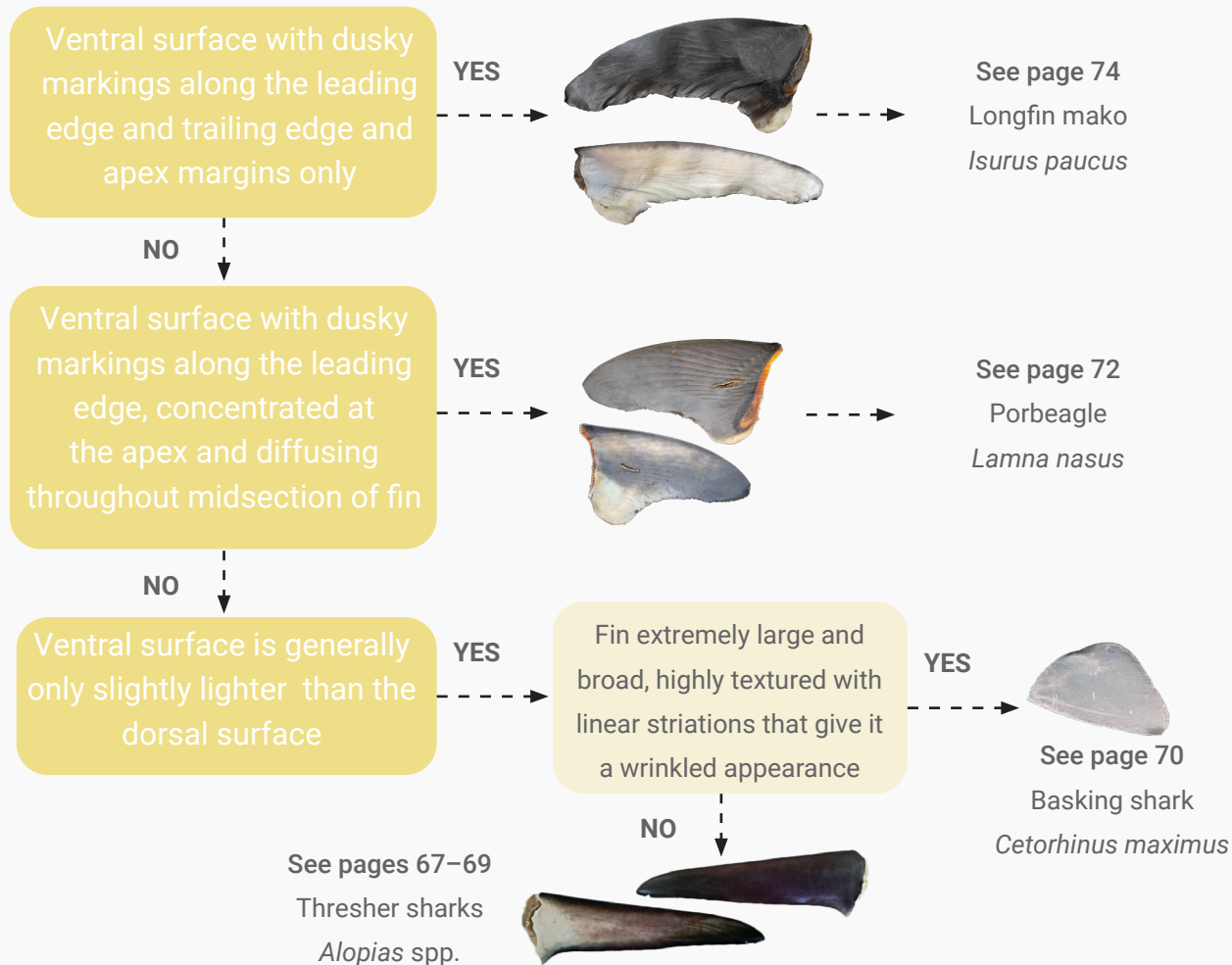
See next page

This is not a species covered in this guide.

(see page 42–43 for descriptions of pectoral fins from non-CITES-listed species with obvious black coloration on ventral surface).



This is not a CITES-listed species



COMPARING MAKO SHARK PECTORAL FINS WITH OTHER SPECIES

The pectoral fins of both the shortfin (*Isurus oxyrinchus*) and longfin (*I. paucus*) mako sharks are morphologically similar in size, shape and coloration at all life stages. They may also be of similar size, shape and coloration of commonly traded pectoral fins from thresher sharks and other mackerel sharks (CITES and non-CITES-listed). The key diagnostic characters on the ventral surface of these pectoral fins are provided here for reference.

Note -- For both species, the ventral surface can sometimes have small, mottled light grey spots visible along the ventral surface of the pectoral fins.

Shortfin mako (*Isurus oxyrinchus*)



- Ventral surface uniform white or light in color with no obvious dark or dusky markings
- Moderately broad (leading edge to trailing edge), with a narrowly rounded apex
- Dorsal surface **with** white margin running along the edge of free rear tip

Longfin mako (*Isurus paucus*)



- Ventral surface mostly white or light in color with dusky or dark markings at apex and along margins of the leading and trailing edges
- Extremely elongated, with a moderately rounded apex
- Dorsal surface **with** white margin running along the edge of free rear tip

Porbeagle shark (*Lamna nasus*)



- Moderately large but short and broad (from leading edge to trailing edge) with a rounded apex
- Dorsal surface dark grey or greyish-brown in color **with** white margin running along the edge of the free rear tip, as seen in lamnid species with fins of similar size and color (e.g., shortfin and longfin mako)
- Ventral surface white or light in color with a dusky coloration throughout the midsection of the fin and along margins of leading and trailing edge

Salmon shark (*Lamna ditropis*)



- Moderately large but short and broad (from leading edge to trailing edge) with a rounded apex
- Dorsal surface dark grey or greyish-brown in color **without** white margin running along edge of free rear tip, as seen in lamnids with fins of similar size and color (e.g., shortfin and longfin mako, porbeagle)
- Ventral surface uniform white or light in color with obvious dark or dusky markings at apex and along margins of leading and trailing edge

Blue shark (*Prionace glauca*)



- Extremely elongated, slender (from leading edge to trailing edge) with a narrowly rounded to slightly pointed apex
- Dorsal surface dark grey or greyish-brown in color **without** white margin running along edge of the free rear tip, as seen in lamnids with fins of similar size and color (e.g., shortfin and longfin mako, porbeagle)
- Ventral surface uniform white or light in color with no obvious dark or dusky markings
- Radial cartilage is easily seen extending from base towards apex

COMPARING SILKY SHARK PECTORAL FINS WITH OTHER SPECIES

Several commonly traded pectoral fins from non-CITES-listed species have dusky coloration concentrated at the apex of the ventral surface. It is therefore helpful to compare those species to pectoral fins from the silky shark (*Carcharhinus falciformis*).

Silky shark (*Carcharhinus falciformis*)



- Dusky coloration heavily concentrated at apex, extending along less than 1/3 of the margin of the trailing edge
- Narrowly rounded at apex

Night shark (*Carcharhinus signatus*)



- Dusky coloration at apex on ventral surface is less concentrated (or obvious), typically diffusing over more of the ventral surface
- Pointed apex

Dusky shark (*Carcharhinus obscurus*)



- Dusky coloration at apex on ventral surface is less concentrated (or obvious), typically diffusing over more of the ventral surface
- Pointed apex

Bull shark (*Carcharhinus leucas*)



- Dusky coloration extends further into the middle of the ventral surface and further along the trailing edge (more than 1/3)
- Pointed apex

Caribbean reef shark (*Carcharhinus perezii*)



- Dusky coloration extends further into the middle of the ventral surface and further along the trailing edge (more than 1/3)
- Pointed apex

COMPARING HAMMERHEAD PECTORAL FINS WITH OTHER HAMMERHEADS

Small to moderate sized pectoral fins (juvenile animals) from the scalloped* and smooth hammerheads (*S. lewini* and *S. zygaena*) may be difficult to distinguish from those from the bonnethead shark (*Sphyrna tiburo*) and scoophead shark (*S. media*), which are non-CITES-listed hammerhead species. It may be necessary to verify species identification using genetic approaches. These non-CITES-listed species have faint to no markings on the ventral surface of the pectoral fins and overlap in distribution with the scalloped and smooth hammerheads in the eastern Pacific or western Atlantic Oceans.

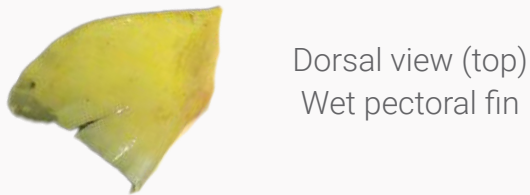
However, pectoral fins from smalleye hammerhead (*S. tudes*) and scalloped bonnethead (*S. corona*) will typically be a deep yellow in colour and can easily be distinguished from CITES-listed *S. zygaena* and *S. lewini* fins.

*certain Indian Ocean *S. lewini* populations lack black tip at apex on ventral surface

Bonnethead shark (*Sphyrna tiburo*)



Smalleye hammerhead (*Sphyrna tudes*)



Scalloped bonnethead (*Sphyrna corona*)



STEP 4 -- Distinguish shark caudal fins from wedgefish and giant guitarfish

SHARK-LIKE RAY AND SHARK CAUDAL FINS

Shark lower caudal lobes cannot reliably be identified to the species level. However, since shark-like rays (sawfish, wedgefish, and giant guitarfish) fin sets generally include a whole caudal fin, it will be necessary to distinguish sawfish fins (Appendix I) from wedgefish and giant guitarfish (Appendix II) in a CITES context.

Shark-like rays (sawfish, wedgefish, giant guitarfish)

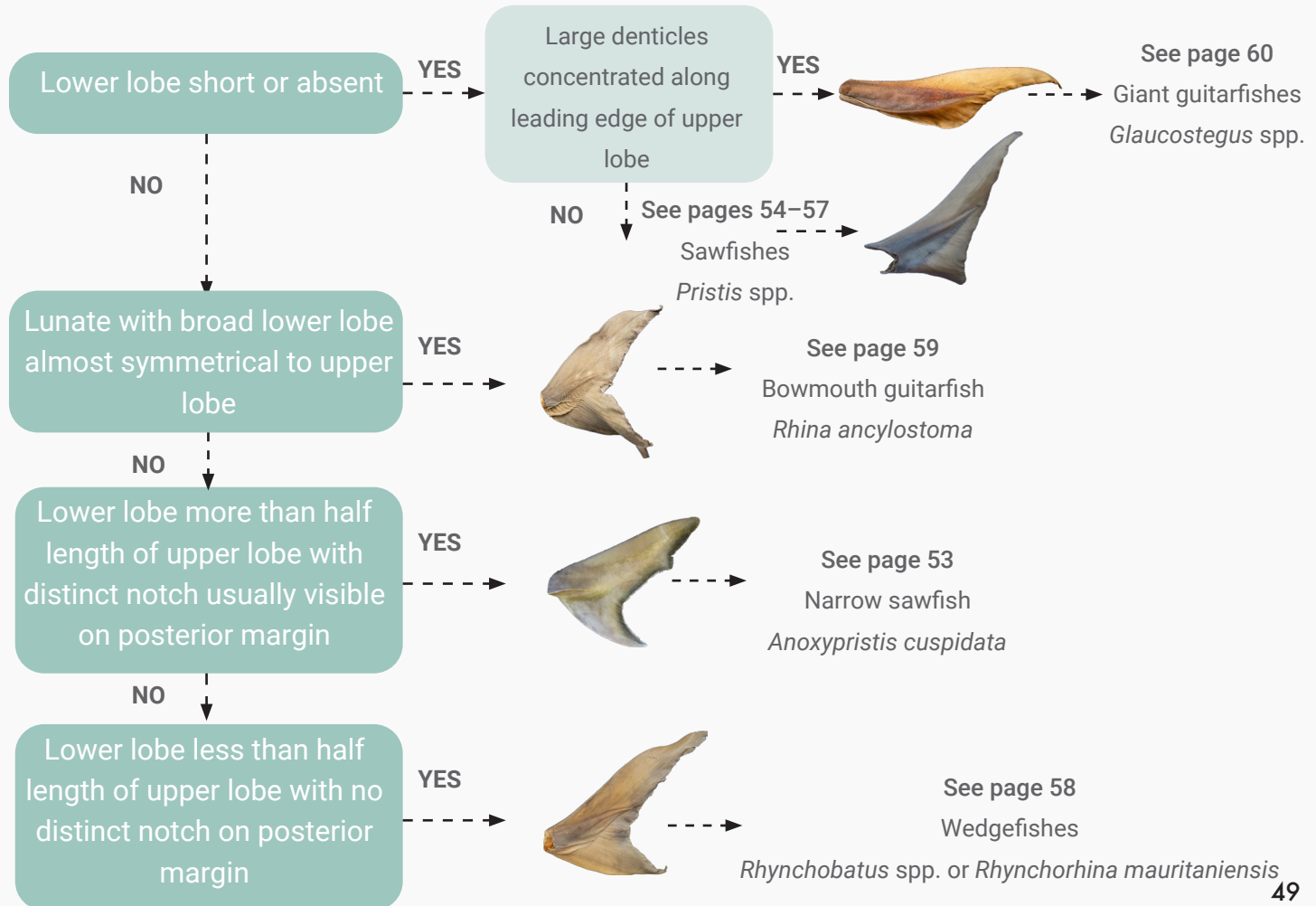


- Cartilage does not extend into the upper lobe
- Shark-like ray caudal fins are traded whole with first and second dorsal fins
- Some white spots may be visible on caudal fins of wedgefishes

Shark caudal fins



- Cartilage extends into upper lobe
- Shark lower caudal lobes are removed and traded with first dorsal fin and paired pectoral fins



COMPARING WHALE SHARK FINS WITH BOWMOUTH GUITARFISH FINS

BOWMOUTH GUITARFISH AND WHALE SHARK FINS

Whale shark (*Rhincodon typus*) and bowmouth guitarfish (*Rhina ancylostoma*) fins are dark to light grey in color with white spots.

Dorsal fins from both species are similar in color but whale shark fins are much larger, have a row of cartilage of similar size and shape running across the entire fin base. On the other hand, dorsal fins derived from the bowmouth guitarfish will vary (depending on cut) with multiple, irregularly shaped rows of cartilage or two long strips of cartilage.

The bowmouth guitarfish is a species of shark-like ray and pectoral fins from this species do not enter the trade. All pectoral fins that are dark grey with white spots dorsally, white ventrally, and usually large in size are likely to belong to a whale shark.

Finally, the caudal fins of both species are likely to be sold intact. The caudal fin of the bowmouth guitarfish is lunate and will usually be sold as a set with the dorsal fins. On the other hand, the caudal fin of the whale shark has a long upper lobe compared to the lower lobe, likely to be extremely large, and sold as a souvenir.

Whale shark fins



D1 fin (wet)



Pectoral fin (wet)



Whole caudal fin
(dry)

- Fins are extremely large
- Dark dorsal surface with white spots visible (and sometimes white bands)
- Dorsal fin short and broad, extremely rounded apex
- Ventral surface of pectoral fins white with no obvious markings

Bowmouth guitarfish fins



D1 fin with white spots



D1 fin without white spots



Whole caudal fin

- Fins are light grey to greyish brown in color, sometimes the spots are barely visible
- Dorsal fins broad, angular at the apex
- Caudal fin without cartilage extending into upper lobe
- Traded in set with two dorsal fins and an intact caudal fin

CONFIRM SPECIES

SHARK-LIKE RAYS

STEP 5 -- Confirm species -- RHINOPRISTIFORMES - Family Pristidae - Sawfishes

NARROW SAWFISH

Anoxypristis cuspidata (Latham, 1794)



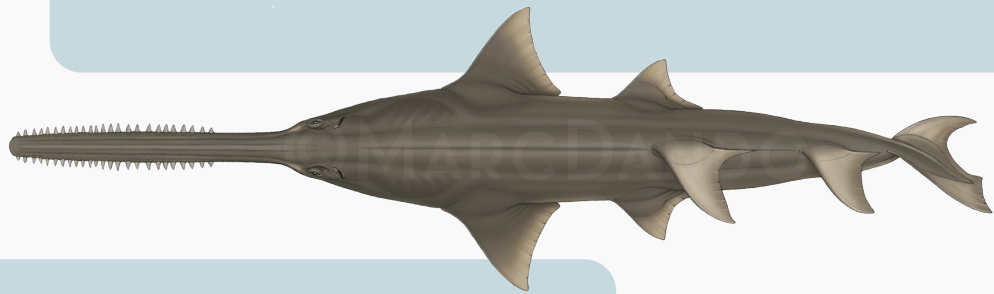
Wet



Dry

DORSAL FINS

Tall, falcate, height greater than width, angular at the apex. Long free rear tip starting directly under apex of D1. Multiple irregularly shaped rows of cartilage or two long strips of cartilage along base. Color light brown or yellowish with a shiny appearance.



CAUDAL FIN

Forked with prominent lower lobe. Upper lobe with distinct notch usually visible on trailing edge (posterior margin) that other sawfish species lack. Lower lobe large, more than half length of upper lobe. Two lateral keels may be present if caudal fin base is intact.



STEP 5 -- Confirm species -- RHINOPRISTIFORMES - Family Pristidae - Sawfishes

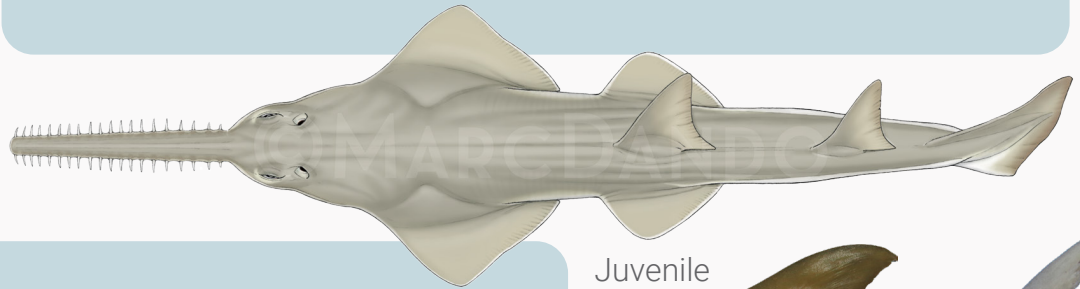
DWARF SAWFISH

Pristis clavata Garman, 1906



DORSAL FINS

Broad, triangular, moderately rounded apex and small denticles more concentrated along the leading edge. Free rear tip short and thick, starting directly under apex in D1 or just anterior to apex in D2. Color greenish to grey-brown with a shiny appearance.



CAUDAL FIN

Not forked with extremely short lower lobe, less than half length of upper lobe. Posterior margin nearly straight. Median keel may be present if caudal fin base is intact, but lacks shorter ventral keel.

Juvenile



Adult



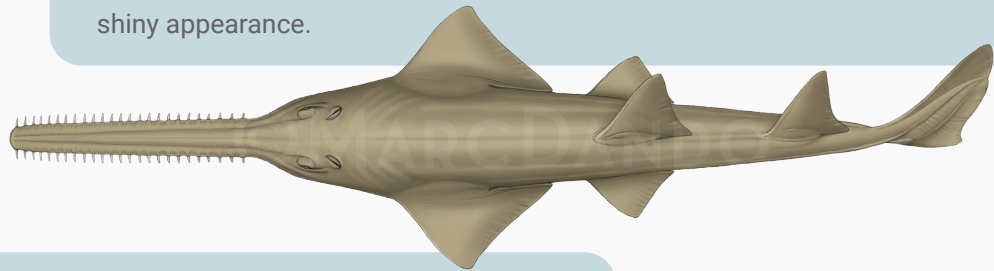
SMALLTOOTH SAWFISH

Pristis pectinata Latham, 1794



DORSAL FINS

Broad, triangular, moderately rounded to angular at apex and with small denticles that are more concentrated along the leading edge. Free rear tip short and thick, starting directly under or just anterior to apex. Color light greyish to light grey-brown with a shiny appearance.



CAUDAL FIN

Not forked with extremely short lower lobe. Posterior margin of fin straight. Median keel may be present if caudal fin base is intact, but lacks shorter ventral keel.



STEP 5 -- Confirm species -- RHINOPRISTIFORMES - Family Pristidae - Sawfishes

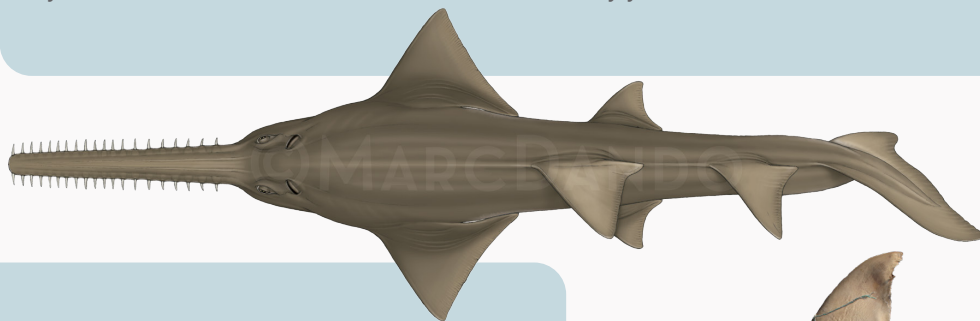
LARGETOOTH SAWFISH

Pristis pristis (Linnaeus, 1758)



DORSAL FINS

Broad, triangular, moderately rounded to angular at apex. Free rear tip short and thick, starting directly under apex in D1 or just anterior to apex in D2. Color brown or yellowish. In some animals, fins can be distinctly yellow.



CAUDAL FIN

Forked with short lower lobe, less than half length of upper lobe. Posterior margin slightly concave. Median keel may be present if caudal fin base is intact, but lacks shorter ventral keel. In some animals, fins can be distinctly yellow.



GREEN SAWFISH

Pristis zijsron Bleeker, 1851



DORSAL FIN

Broad, triangular, moderately rounded to angular at the apex. Free rear tip short and thick, starting directly under or just anterior to the apex. Color green to greenish brown when dry.



CAUDAL FIN

Not forked with short lower lobe, less than half length of upper lobe. Posterior margin straight in adults but convex in young individuals. Median keel may be present if caudal fin base is intact, but lacks shorter ventral keel.



RHINOPRISTIFORMES - Family Rhinidae - Wedgefishes

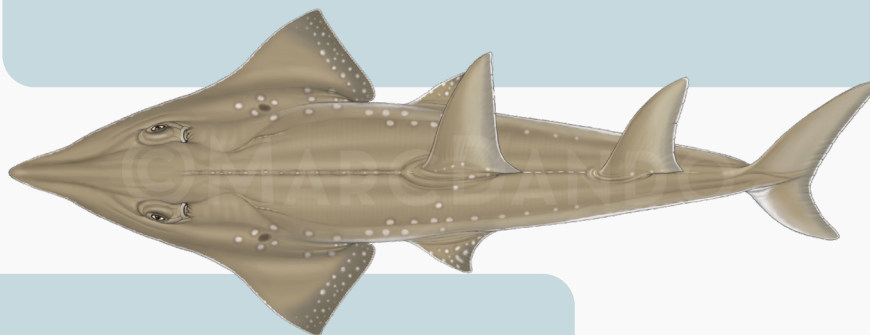
WEDGEFISHES

Rhynchobatus spp.



DORSAL FINS

Tall, narrow, with height greater than width. Strongly falcate with multiple irregularly shaped rows of cartilage or two long strips of cartilage along base. Color brownish or yellowish with shiny appearance.



CAUDAL FIN

Forked with prominent lower lobe. Lower lobe less than half length of upper lobe with no distinct notch on the posterior margin. Uniform in color with yellowish tone and shiny appearance.



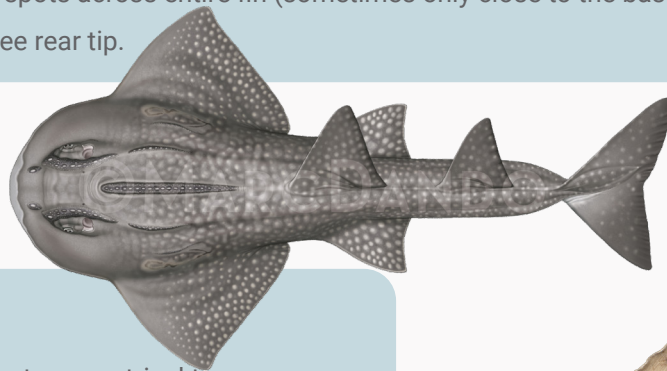
BOWMOUTH GUITARFISH

Rhina ancylostoma Bloch and Schneider, 1801



DORSAL FINS

Tall, narrow, with height greater than width. Multiple irregularly shaped rows of cartilage or two long strips of cartilage along base. Dull, brownish grey, usually with white spots across entire fin (sometimes only close to the base or faded) and rounded free rear tip.



CAUDAL FIN

Lunate with broad lower lobe that is almost symmetrical to upper lobe. Some white spots might also be visible on the surface.



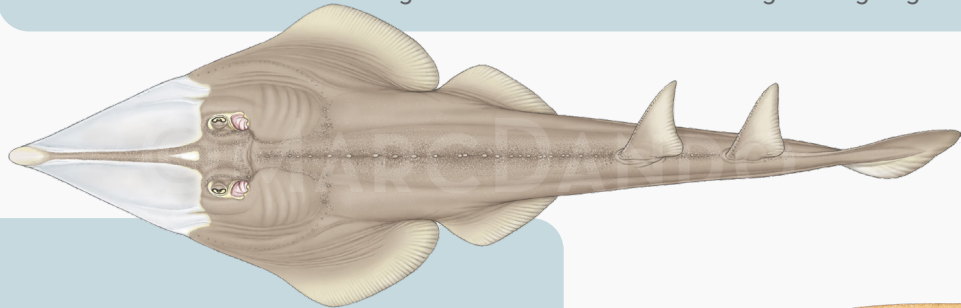
RHINOPRISTIFORMES - Family Glaucostegidae - Giant Guitarfishes

GIANT GUITARFISH
Glaucostegus spp.



DORSAL FINS

Tall, narrow, with height greater than width. Usually with pointed apices except for the widenose guitarfish (*Glaucostegus obtusus*) that are short and rounded at the apex. Multiple irregularly shaped rows of cartilage or two long strips of cartilage along base. Uniform in color with large denticles concentrated along leading edge.



CAUDAL FIN

Lower lobe absent with large visible denticles concentrated along the leading edge of the upper lobe. Generally uniform yellowish in color.



SPECIES PAGES

SHARKS

CARCHARHINIFORMES - Family Carcharhinidae - Requiem Sharks

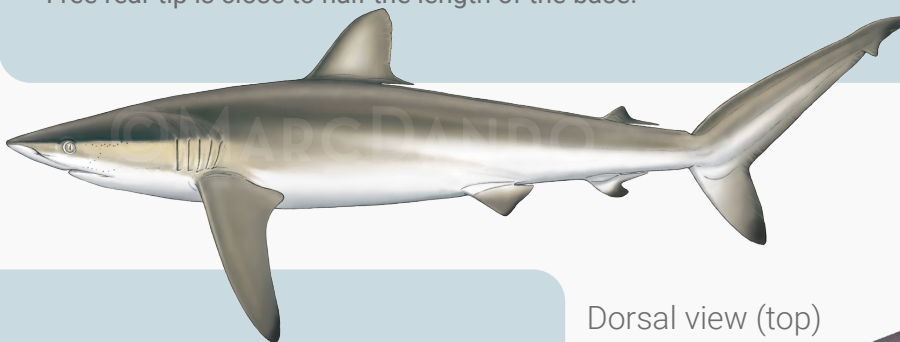
SILKY SHARK

Carcharhinus falciformis (Bibron, 1839)



FIRST DORSAL FIN

Uniform grey to greyish-brown with sloping leading edge, moderately rounded (as opposed to pointed) apex, and strongly convex (outwardly rounded) trailing edge. Free rear tip is close to half the length of the base.



PECTORAL FINS

Long, nearly straight trailing edge, narrowly rounded apex. Dorsal surface is grey or greyish-brown, and ventral surface is white with a visible dusky coloration concentrated at the apex and extending along less than 1/3 of the margin of the trailing edge.

Dorsal view (top)



Ventral view (underneath)

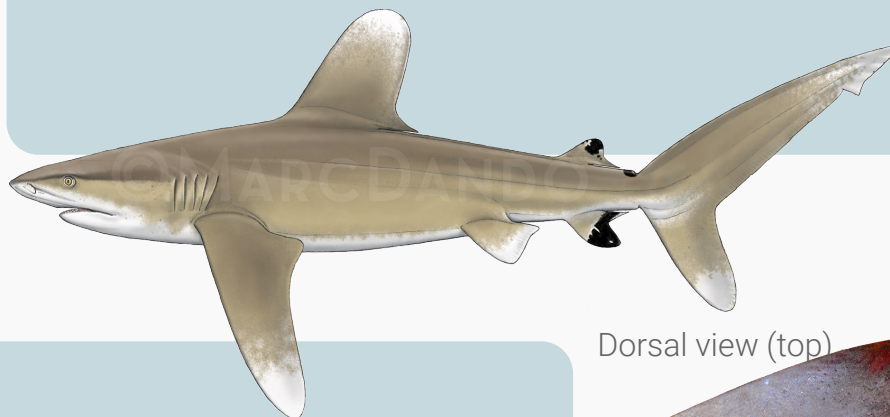
OCEANIC WHITETIP SHARK

Carcharhinus longimanus (Poey, 1861)



FIRST DORSAL FIN

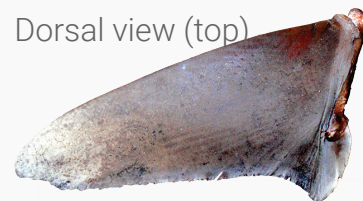
Large and broadly rounded (paddle-like). Mottled white color at apex.



PECTORAL FINS

Long, broadly rounded at apex, dorsal surface has mottled white color at apex. Ventral surface typically white but can have mottled brown coloration. Mottled white color also present on caudal fin (upper and lower lobe). Very small juveniles may have mottled black coloration on D1, pectoral and caudal fins.

Dorsal view (top)



Ventral view (underneath)

CARCHARHINIFORMES - Family Sphyrnidae - Hammerhead Sharks

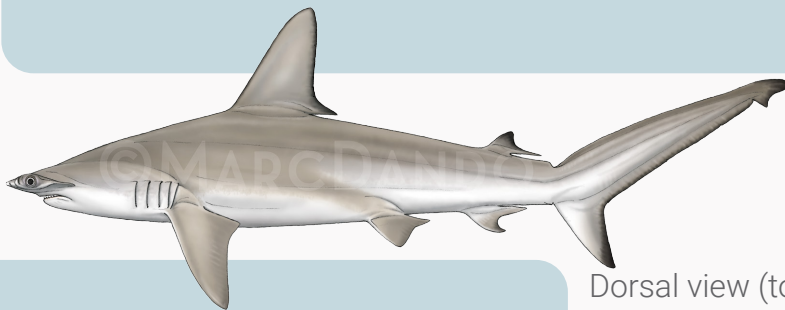
SCALLOPED HAMMERHEAD

Sphyrna lewini (Griffith & Smith, 1834)



FIRST DORSAL FIN

Tall, flattening out toward apex, straight to moderately curved trailing edge (similar to smooth hammerhead (*S. zygaena*), less slender than great hammerhead (*S. mokarran*) D1).

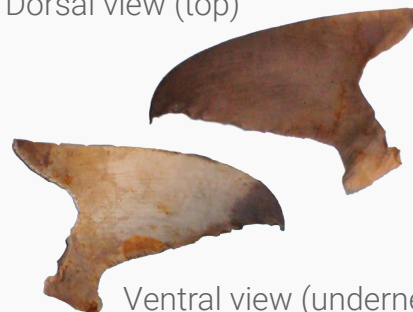


PECTORAL FINS

Short and broad, dorsal surface is uniform, light brown or light greyish-brown in color. Ventral surface light in coloration with distinct black markings concentrated at the apex.

Note - certain Indian Ocean *S. lewini* populations lack black tip at apex on ventral surface and look like *S. zygaena* pectoral fins - **both are listed!**

Dorsal view (top)



Ventral view (underneath)

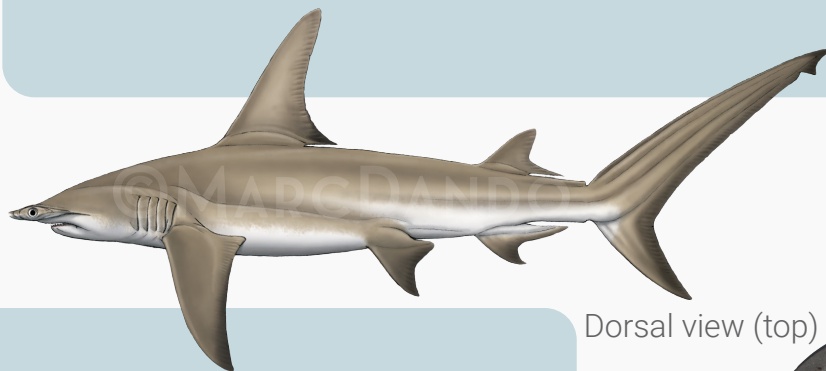
GREAT HAMMERHEAD

Sphyrna mokarran (Rüppell, 1837)



FIRST DORSAL FIN

Tall, slender from leading edge to trailing edge, elongated and pointed at apex. See page 31 for comparison with the non-CITES-listed winghead shark.



PECTORAL FINS

Pointed apex, moderately curved along trailing edge with dusky color at apex on ventral side and often along trailing edge.

Dorsal view (top)



Ventral view (underneath)

CARCHARHINIFORMES - Family Sphyrnidae - Hammerhead Sharks

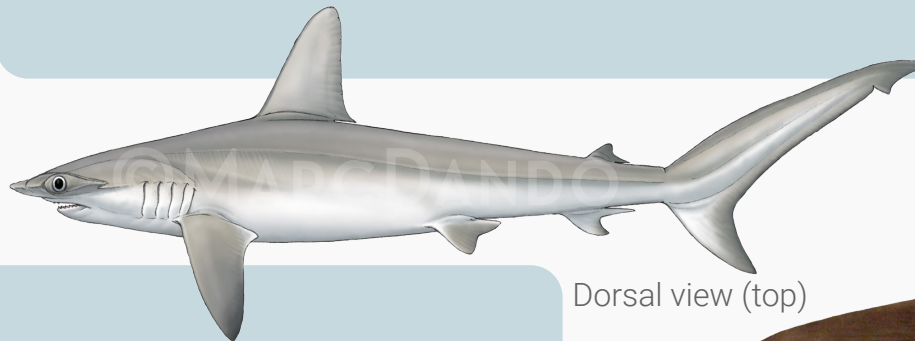
SMOOTH HAMMERHEAD

Sphyrna zygaena (Linnaeus, 1758)



FIRST DORSAL FIN

Tall, sloping more at apex, moderately curved trailing edge (similar to scalloped hammerhead (*S. lewini*), less slender than great hammerhead (*S. mokarran*) D1).



PECTORAL FINS

Short and broad, dorsal surface is uniform, light brown or light greyish-brown in colour. Ventral surface is uniform and light in coloration, lacking distinct markings.

Note - certain Indian Ocean *S. lewini* populations lack black tip at apex on ventral surface and look like *S. zygaena* pectoral fins - **both are listed!**

Dorsal view (top)



Ventral view (underneath)

LAMNIFORMES - Family Alopiidae - Thresher Sharks

PELAGIC THRESHER

Alopias pelagicus Nakamura, 1935



FIRST DORSAL FIN

Broad and erect with steep angled leading edge, slightly convex trailing edge and short free rear tip. Very thick across the base with thick basal cartilage that is compressed and elongated laterally. Not as tall as D1 of the common thresher (*A. vulpinus*).



PECTORAL FINS

Long and slender from leading edge to trailing edge, curving slightly at the rounded apex. Dorsal surface is dark grey to dark greyish-brown. Ventral surface is almost as dark as the dorsal surface with visible light coloration at the base and extending into the middle of the fin. Margins of the leading and trailing edges are dark.

Dorsal view (top)



Ventral view (underneath)



LAMNIFORMES - Family Alopiidae - Thresher Sharks

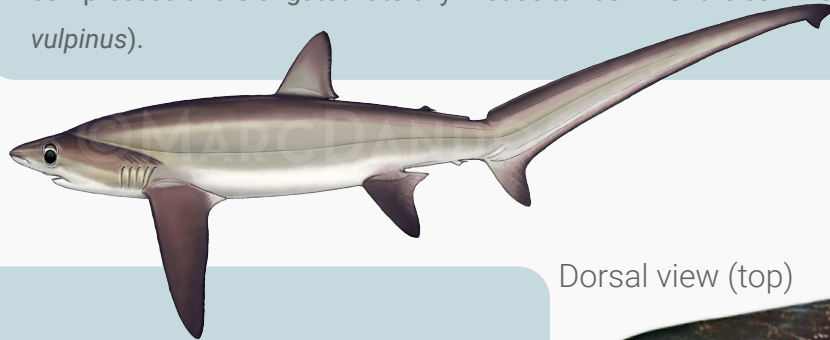
BIGEYE THRESHER

Alopias superciliosus (Lowe, 1841)



FIRST DORSAL FIN

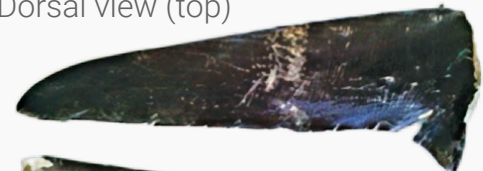
Broad and erect with steep angled leading edge, slightly convex trailing edge and short free rear tip. Very thick across the base with thick basal cartilage that is compressed and elongated laterally. Not as tall as D1 of the common thresher (*A. vulpinus*).



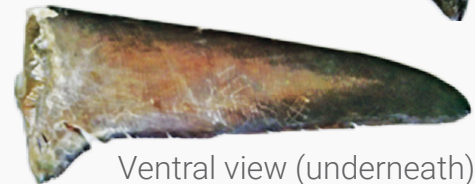
PECTORAL FINS

Long and slender from leading edge to trailing edge, curving slightly at the rounded apex. Dorsal surface is a dark grey to dark greyish-brown. Ventral surface is almost as dark as the dorsal surface with a visible light coloration at the base that extends into the middle of the fin. Margins of the leading and trailing edges are dark.

Dorsal view (top)



Ventral view (underneath)



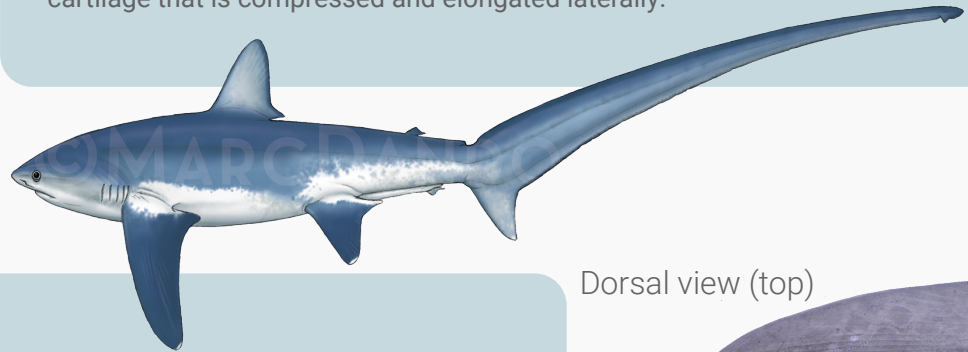
COMMON THRESHER

Alopias vulpinus (Bonnaterre, 1788)



FIRST DORSAL FIN

Tall, erect with steep angled leading edge, slightly convex trailing edge, narrowly rounded apex and short free rear tip. Very thick along the base and thick basal cartilage that is compressed and elongated laterally.



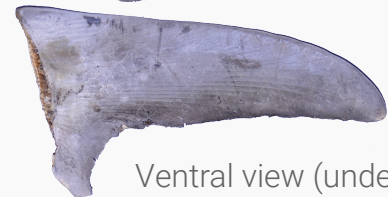
PECTORAL FINS

Long and slender from leading edge to trailing edge, curving slightly at the rounded apex. Dorsal surface is dark grey to dark greyish-brown. Ventral surface is almost as dark as the dorsal surface with a mottled white coloration at the base. There is often a very small white spot at the tip of the apex (visible on both dorsal and ventral surfaces).

Dorsal view (top)



Ventral view (underneath)



LAMNIFORMES - Family Cetorhinidae - Basking Shark

BASKING SHARK

Cetorhinus maximus (Gunnerus, 1765)



FIRST DORSAL FIN

Very large and broad, not tall (fin base similar in length to fin height) with moderately rounded apex. Color can vary from dark grey to light grey surface, with highly textured skin and linear striations visible across the surface of the fin. Free rear tip starts posterior to the apex.



PECTORAL FINS

Very large and broad. Dorsal surface colour can vary from dark grey to light grey in color. Ventral surface with little or no obvious markings, similar in color to the dorsal surface (not lighter, as typical for shark pectoral fins).



Ventral view (underneath)

LAMNIFORMES - Family Lamnidae - Mackerel Sharks

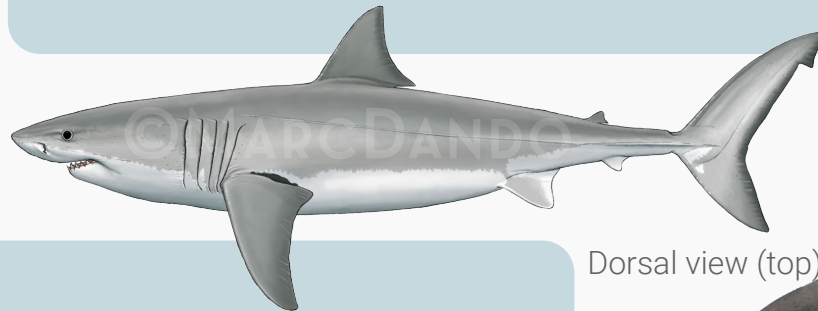
GREAT WHITE SHARK

Carcharodon carcharias (Linnaeus, 1758)



FIRST DORSAL FIN

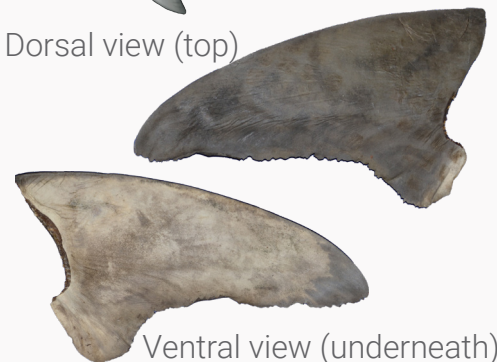
Dorsal fin large and triangular, dull dark grey to greyish brown in color. Leading edge angular, flattening out at the moderately pointed apex. Trailing edge slightly concave, often with a ragged appearance. Free rear tip short, origin starting behind the apex.



PECTORAL FINS

Large, dorsal surface dull dark grey to greyish brown in color with white margin along the of the free rear tip. Ventral surface white or pale with black markings at the moderately pointed apex.

Dorsal view (top)



Ventral view (underneath)

LAMNIFORMES - Family Lamnidae - Mackerel Sharks

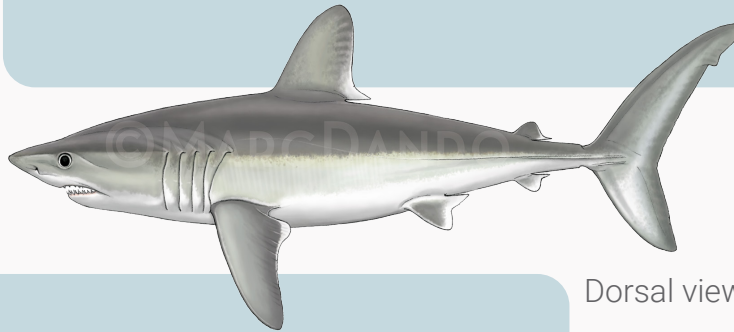
PORBEAGLE SHARK

Lamna nasus (Bonnaterre, 1788)



FIRST DORSAL FIN

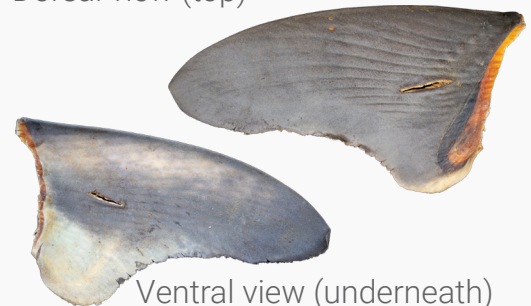
Dark blue/black to dark greyish brown, rounded apex with distinct white patch on lower trailing edge onto free rear tip.



PECTORAL FINS

Short and broad from leading edge to trailing edge, with a rounded apex. Dorsal surface dark or slate grey in color with visible white margin running along the leading edge of the free rear tip. Ventral surface dusky in coloration along the leading edge, and concentrated at the apex and diffusing along the midsection of the fin.

Dorsal view (top)



Ventral view (underneath)

SHORTFIN MAKO

Isurus oxyrinchus Rafinesque, 1810

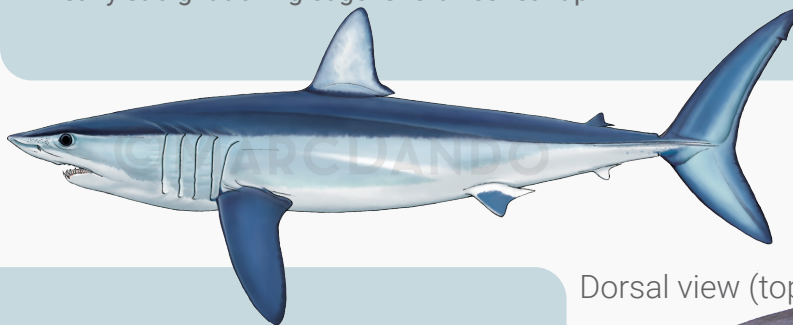
EN

SMA



FIRST DORSAL FIN

Uniform, dark slate grey (wet) or greyish-brown (dried, semi-dried) in color. Tall, very erect fin due to the steep angle of the leading edge. Moderately rounded apex, and nearly straight trailing edge. Short free rear tip.



PECTORAL FINS

Moderately broad (leading edge to trailing edge), with a narrowly rounded apex. Dorsal surface is dark slate grey (wet) or greyish-brown (dried, semi-dried) in color with an obvious white margin running along the edge of the free rear tip. Ventral surface is uniform white or light in color with no obvious dark or dusky markings.

Dorsal view (top)



Ventral view (underneath)

LAMNIFORMES - Family Lamnidae - Mackerel Sharks

LONGFIN MAKO

Isurus paucus Guitart Manday, 1966

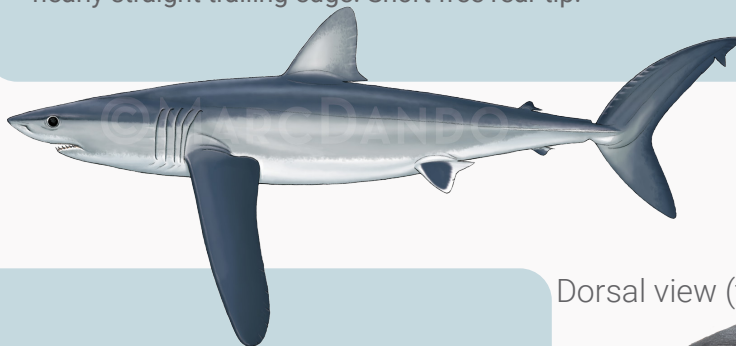
EN

LMA



FIRST DORSAL FIN

Uniform, dark slate grey (wet) or greyish-brown (dried, semi-dried) in color. Tall, very erect fin due to the steep angle of the leading edge. Moderately rounded apex, and nearly straight trailing edge. Short free rear tip.



PECTORAL FINS

Extremely elongated, with moderately rounded apex. Dorsal surface dark slate grey (wet) or greyish-brown (dried, semi-dried) in color with an obvious white margin running along the edge of the free rear tip. Ventral surface is mostly white or light in color with dusky or dark markings at the apex and along the margins of the leading and trailing edges.

Dorsal view (top)



Ventral view (underneath)

ORECTOLOBIFORMES - Family Rhincodontidae - Whale Shark

WHALE SHARK

Rhincodon typus Smith, 1828

EN

RHN



FIRST DORSAL FIN

Very large and triangular, grey to grey-black in color with white spots (and sometimes linear bands) across the entire fin surface. Free rear tip starts posterior to the apex.

Note - See page 51 for comparison to *Rhina ancylostoma* dorsal fins.



Dorsal view (top)

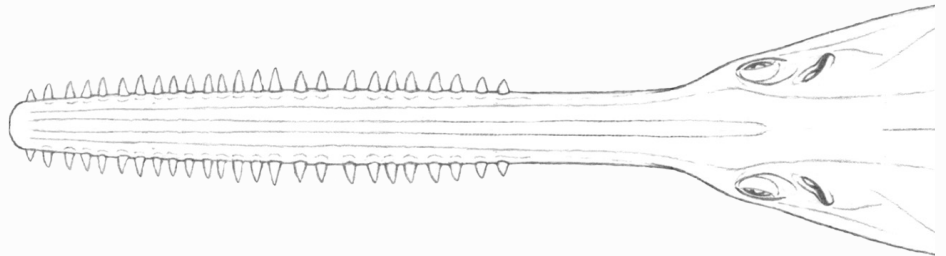
PECTORAL FINS

Very large and strongly falcate (concave trailing edge). Dorsal surface grey to grey-black in color with white spots (and sometimes stripes) across the entire surface. Ventral surface white with little or no obvious markings.



SECTION 2

IDENTIFYING SAWFISH ROSTRA



SAWFISH ROSTRA

Sawfish rostra sometimes also enter the international trade. All five species of sawfishes are listed on Appendix I of CITES and therefore **commercial trade in their products is prohibited**. Any shipments containing these can be stopped immediately. The following descriptions are provided in case inspectors also need to identify rostra to the species-level. When differentiating between sawfish rostra, the key features to look at are the number of rostral teeth on each side of the saw and the space separating them.

NARROW SAWFISH

Anoxypristis cuspidata

No teeth at base of saw,
gaps unevenly spaced

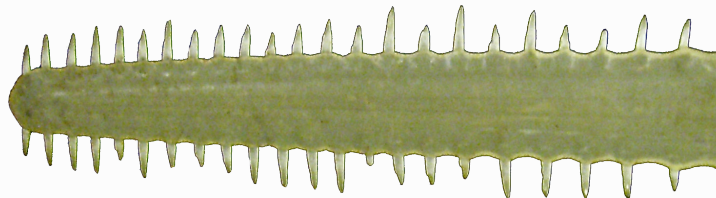


16–33 teeth
per side of saw

DWARF SAWFISH

Pristis clavata

Teeth evenly spaced



18–27 teeth
per side of saw

SMALLTOOTH SAWFISH

Pristis pectinata

Teeth get closer together
toward the tip



20–32 teeth
per side of saw

LARGETOOTH SAWFISH

Pristis pristis

Teeth evenly spaced, last
tooth gap near tip
bigger than preceding gap



14–24 teeth
per side of saw

GREEN SAWFISH

Pristis zijsron

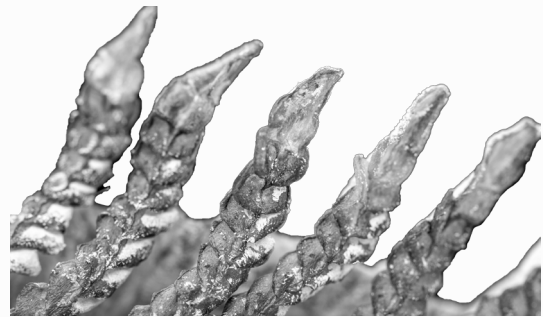
Teeth get closer together
toward the tip



23–37 teeth
per side of saw

SECTION 3

IDENTIFYING MANTA AND DEVIL RAY GILL PLATES



GILL PLATE FEATURES

Gill plates (prebranchial appendages) from five different species of manta and devil rays have been found in the gill plate trade. There are three key features that can be used to easily identify each gill plate types: (1) gill plate size, (2) gill plate color, and (3) gill plate filament edging.

1. **Size:** measured as the total length of the traded gill plate



2. **Colour:** bicolored (below) or uniform (above)



3. **Filament edging:** smooth (left) or separated/bristled (right)



KEY TO VISUAL IDENTIFICATION

Gill plates from the two species of manta rays (*Mobula alfredi* and *M. birostris*) can be visually identified and easily distinguished from the traded devil ray species' gill plates. Manta ray gill plates are uniform brown/black/white in color, usually much larger (more than 30 cm), and have a smooth lobe edge. On the other hand, devil ray gill plates are usually small to medium in size (often less than 30 cm in length), and either bicolored (white in the middle) with a smooth edge, or bicolored (white on the outside) or single color with jagged filament edges..



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.

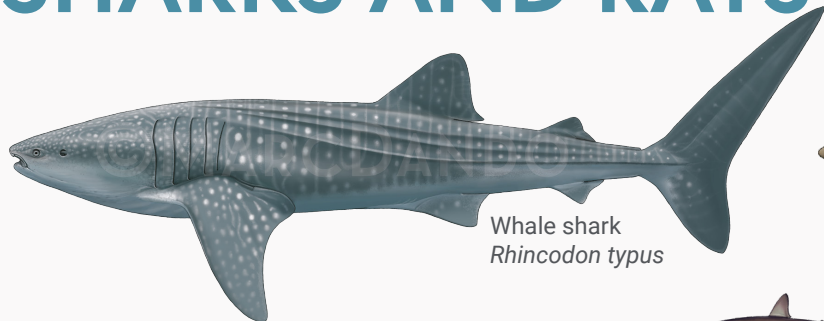
Overall, international trade of products derived from sharks and rays listed in Appendix I and II requires the CITES Management Authority of exporting countries to issue export documents certifying that the trade in each specimen is legal and not detrimental to the survival of the species. Customs personnel 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



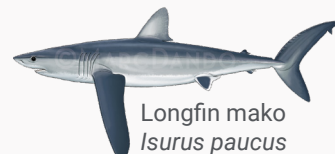
Oceanic whitetip shark
Carcharhinus longimanus



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



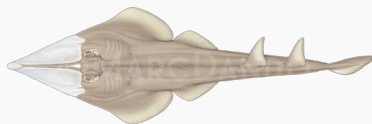
Oceanic manta
Mobula birostris *



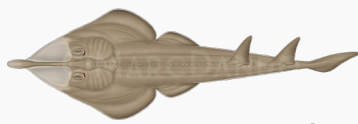
Reef manta
Mobula alfredi *



Spinetail devil ray
Mobula mobular *



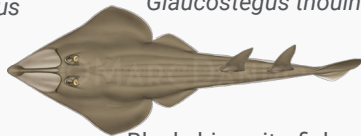
Sharpnose guitarfish
Glaucostegus granulatus



Clubnose guitarfish
Glaucostegus thouin



Halavi guitarfish
Glaucostegus halavi



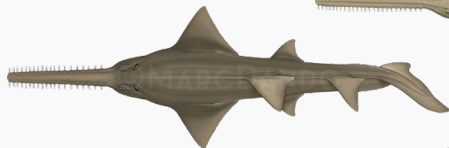
Blackchin guitarfish
Glaucostegus cemiculus



Giant guitarfish
Glaucostegus typus



Widenose guitarfish
Glaucostegus obtusus



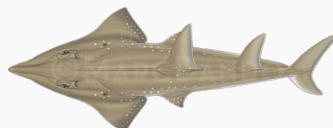
Largetooth sawfish
Pristis pristis *



Smalltooth sawfish
Pristis pectinata



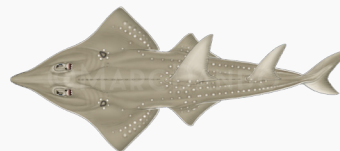
Green sawfish
Pristis zijsron



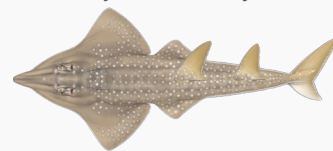
Bottlenose wedgefish
Rhynchobatus australiae



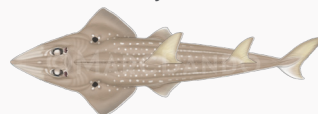
Whitespotted wedgefish
Rhynchobatus djiddensis



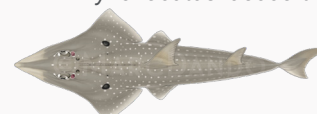
Smoothnose wedgefish
Rhynchobatus laevis



African wedgefish
Rhynchobatus luebberti



Eyebrow wedgefish
Rhynchobatus palpebratus



Broadnose wedgefish
Rhynchobatus springeri



False shark ray
Rhynchorhina mauritaniensis



Bowmouth guitarfish
Rhina ancylostoma



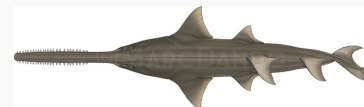
Taiwanese wedgefish
Rhynchobatus immaculatus



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, color, and texture of dorsal, pectoral, and caudal fins, conspicuous coloration patterns on fins) were assessed for consistency within species and variations across geographic distributions (when possible) using photographs supplied by colleagues, published in the literature, and online. Special thanks to Ryan Charles, Daniel Fernando, and Alexandra Morata for providing constructive review.

Photographs were collected across field sites by the

authors or provided by colleagues in support of the development of previous versions of the fin identification portion of this guide. We thank Guy Stevens and Daniel Fernando from The Manta Trust for providing pictures (gill plate pictures by Paul Hilton) and information on how to differentiate between *Mobula* spp. gill plates. We are grateful for picture contributions from Brad Norman from Ecocean (whale shark, *Rhincodon typus*, dorsal and pectoral fins); Demian Chapman (whale shark, dried caudal fin); Ali Hood from The Shark Trust and Mauvis Gore (basking shark, *Cetorhinus maximus*); Jeff Whitty from the Sawfish Conservation Society (sawfish rostra); John Carlson (rostrum and fins, smalltooth sawfish, *Pristis pectinata*); Will White (narrow sawfish, *Anoxypristis cuspidata*, and dwarf sawfish, *P. clavata*, fins); Alastair Harry (green sawfish, *P. zijsron*); Alifa Haque (largetooth sawfish, *P. pristis*); Diego Cardenosa (scalloped bonnethead, *Sphyna corona*), Anna-Marie Steele (small-eye hammerhead, *S. tudes*), and Juan Carlos Perez Jimenez (bonnethead shark, *S. tiburo*).

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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 products derived 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; containers destined for international trade).

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 different derivative products.

This **Product ID** guide uses a flow chart format, images, and descriptions of the key features that can be quickly used to easily distinguish derivative products (fins, gill plates, rostra) of CITES-listed species from non-listed species during routine inspections. Improved identification to the species level will lead to a better 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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