

CITES SHARKS AND RAYS

Implementing and enforcing listings -- VOLUME II

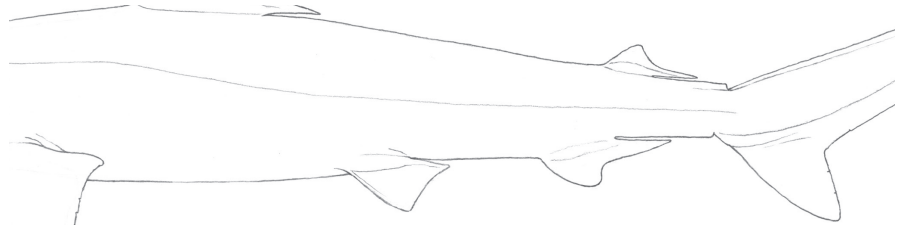


PROCESSED CARCASS ID

CITES SHARKS AND RAYS

Implementing and enforcing listings -- VOLUME II

PROCESSED CARCASS ID



Debra L. Abercrombie
Rima W. Jabado

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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 the increasing demand for meat.

In many fisheries around the world, sharks and rays are sometimes landed dressed – with the head and primary fins removed. With the removal of these key morphological features, identification is a challenge. For example, Indonesia—the world’s largest shark and ray fishing nation—is responsible for 13% of the global reported catch and supplies domestic and international markets with a wide range of products. While the Ministry of Marine Affairs and Fisheries Indonesia

(MMAF) has taken notable steps to monitor this trade, 67% of shark- and ray-derived products are not identified to the species level due to the large volumes of animals landed and the difficulties in identifying processed carcasses. Furthermore, a significant number of 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. These CITES-listed species are believed to account for as much as 30% of products being exported that are likely leaving the country undetected.

To identify and address challenges of detecting illicit trade in protected or CITES-listed sharks and rays, MMAF has been working with the Centre for Environment, Fisheries and Aquaculture Science (Cefas) and the University of Salford (United Kingdom) on a project funded by the Illegal Wildlife Trade Challenge Fund. Across Indonesia, key personnel responsible for visually inspecting shipments containing products being transported across provinces and exported into international markets (including the detection of trade in protected or CITES-listed species) have indicated a high degree of confidence in the visual identification of fins from CITES-listed species. This is due to access to available field guides and hands-on training. However, they have underscored that identifying processed (headless and/or finless) shark and ray carcasses as a significant challenge in implementing trade controls.

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 [*this guide*], 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 different derivative products.

This **Processed Carcass ID** guide was created to enable inspectors to visually identify a large number of shark and ray processed carcasses (trunks) found in trade in order to facilitate the monitoring of trade of those species listed in Appendix I and II of CITES. It has been designed to meet the need expressed by inspectors in Indonesia and other countries for an identification tool that is quick and easy to use when faced with the identification of processed carcasses.

Note on potential limitations for using this field guide: This guide provides a general reference for the identification of processed 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 this guide has been developed to only include the most common species landed in Indonesia and the broader Indian Ocean region. While many of the non-CITES-listed species covered in this guide have a global distribution, other species featured may be rare or might not occur elsewhere (e.g., in the Atlantic Ocean). Furthermore, users of this guide should keep in mind that there could be regional variations in morphological characters (fin positions, coloration) for some species that could potentially impede the identification of processed carcasses to the species level. Finally, in some cases, the second dorsal, anal fin, and/or pelvic fins may have been removed or otherwise damaged or altered during processing of the carcass. This may hinder the ability to visually identify the carcass to species or even to genus level and will require genetic approaches for further verification of species identification.

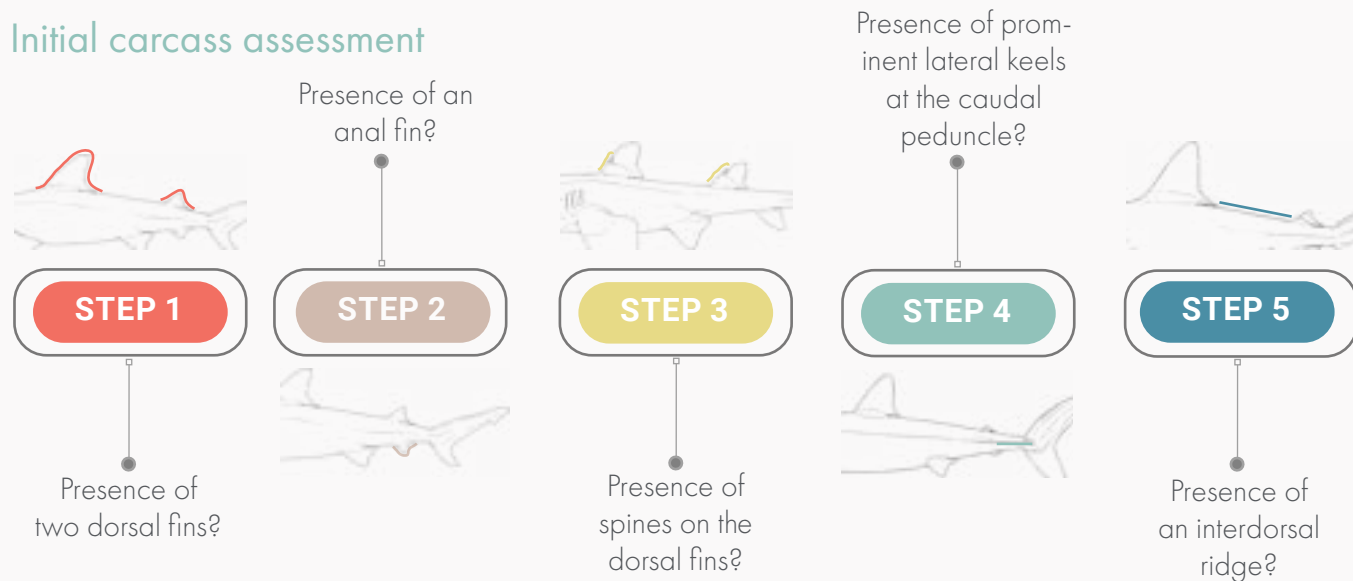
How to use this guide

This guide is designed to aid inspectors in accurately identifying a processed carcass to the species level or genus level for all shark and ray species listed in Appendix I and II of CITES. In addition, through comparisons with other commercially important shark and ray species, it allows identifying the most common pelagic and coastal shark species occurring in the Indian Ocean. The first step for users is to refer to the flow chart on page 16. It is set up to ask a series of statements consisting of two choices, either **Yes** or **No**, that describe key characteristics that remain on processed carcasses for species commonly traded for their meat. These features can be used to quickly and easily distinguish CITES-listed species from non-CITES-listed species during routine inspections. The user begins the identification process based on five color-coded steps developed using the fundamental taxonomic features in the following **initial carcass assessment**:

- 1 - Presence of two dorsal fins?
- 2 - Presence of an anal fin?
- 3 - Presence of spines on the dorsal fins?
- 4 - Presence of prominent lateral keels (ridges on the sides of the body) at the caudal peduncle?
- 5 - Presence of an interdorsal ridge?

Based on the choices made in each step that best describes the unidentified carcass, the user moves to the next set of statements until an identification is made. Each species page then contains detailed information on what to look for to tell a carcass apart from other similar-looking species that are either CITES-listed or commonly caught in the Indian Ocean region. Each step has been color-coded to facilitate species grouping under each feature mentioned as illustrated below.

Initial carcass assessment



Information on each species is provided including common name, scientific name, known size range (at birth and maximum **total length (TL)**). Illustrations are used throughout the guide for CITES-listed species while photographs are used for non-CITES-listed species. Additional photographs, taken at processing sites in Indonesia, are provided at the end of this guide (page 48 onwards) to showcase different processing methods.



This symbol is used in the guide to indicate that a species is **NOT** listed on CITES and therefore is not subject to trade controls under this agreement.

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.

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

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.

dorso-ventrally compressed – flattened from top to bottom.

dusky – slightly dark or greyish in color.

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 fins.

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

precaudal – situated before the tail or caudal fin.

lateral keels – ridges on the sides of the body.

laterally compressed – flattened from side to side.

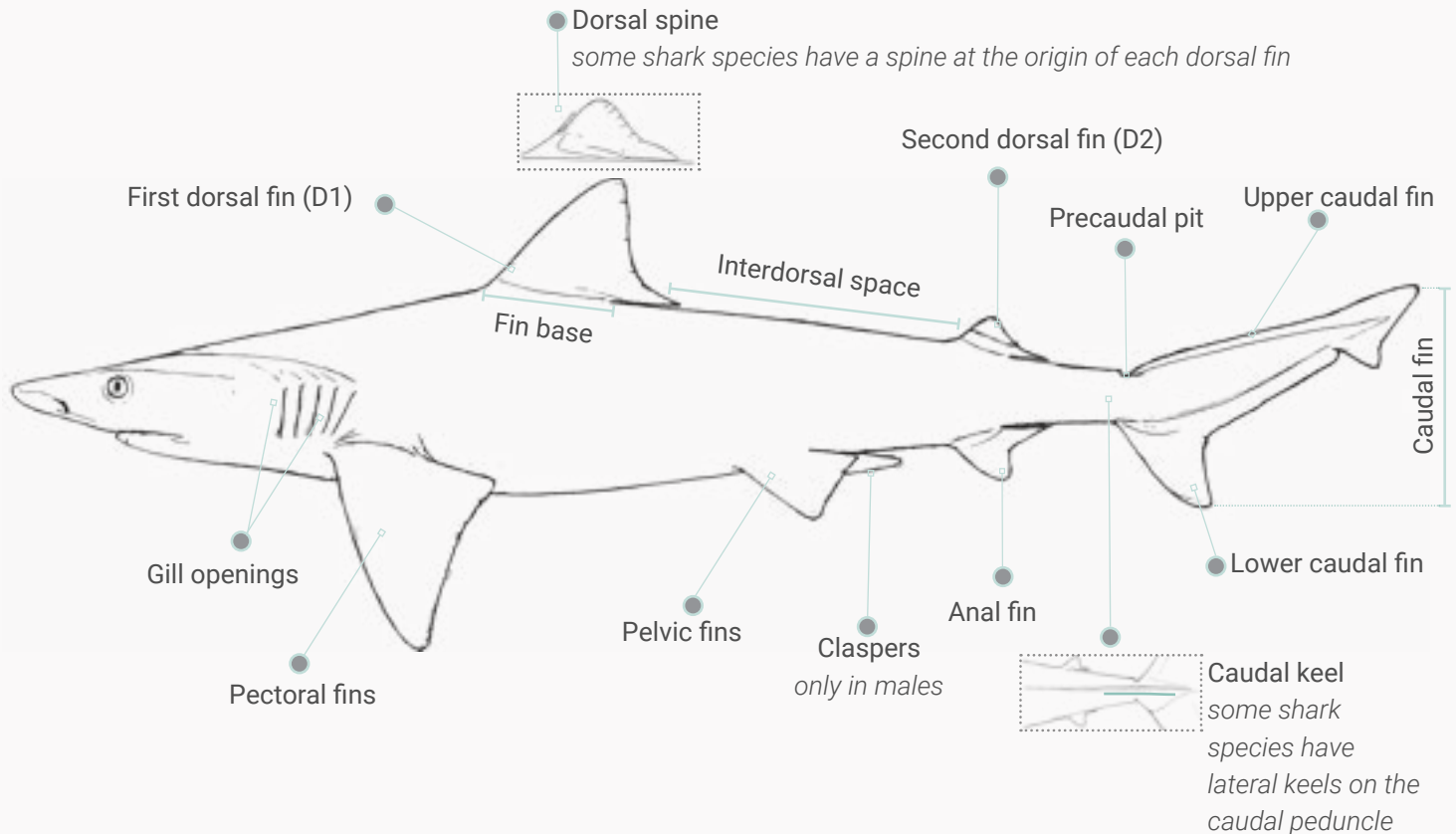
margin – edge or border of the body or fin.

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

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

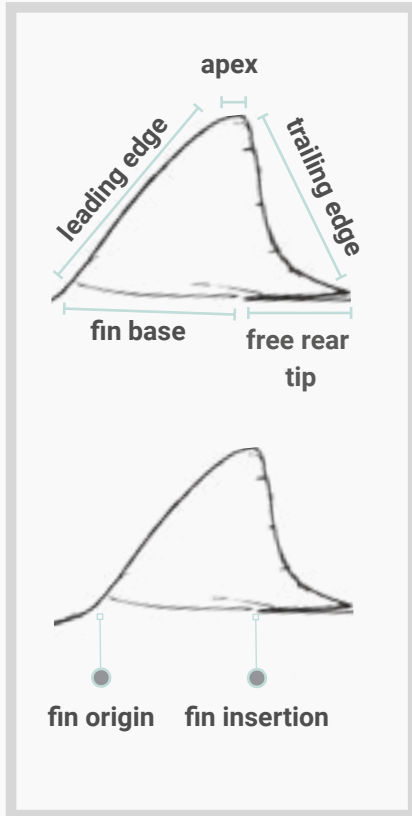
ANATOMY

The following lateral view illustration of a shark highlights the external terminology used in this guide to describe key features used in the identification of processed carcasses.



FIN POSITIONS AND SHAPES

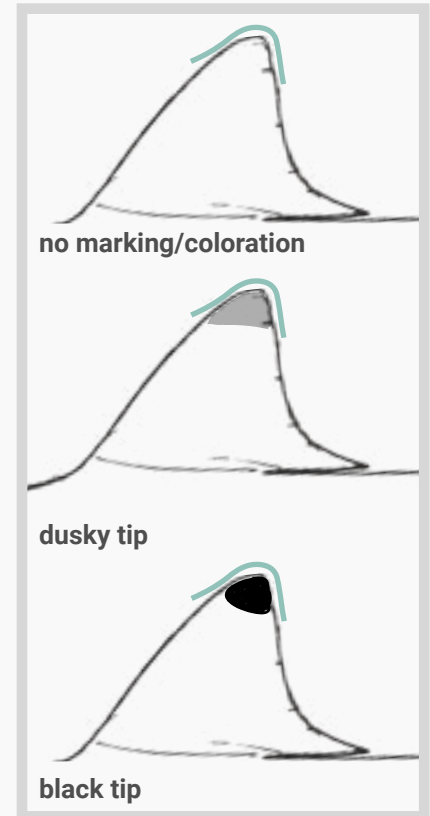
Dorsal fins



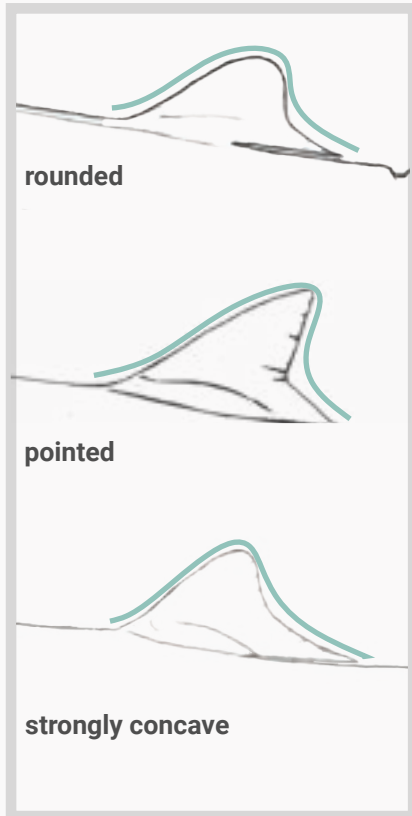
Second dorsal and anal fin positions



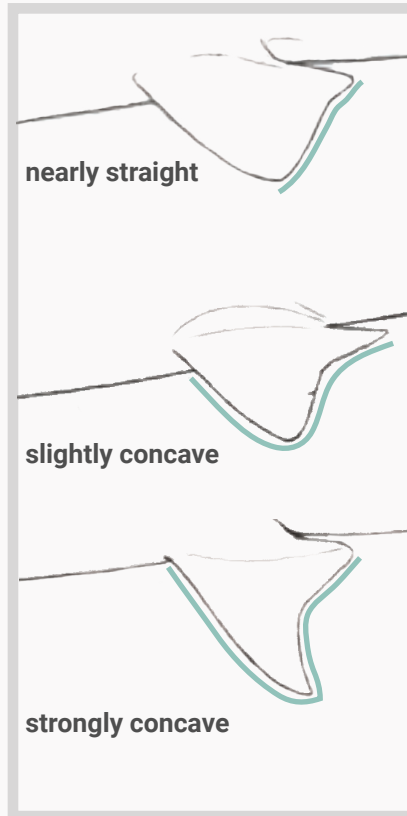
Fin coloration



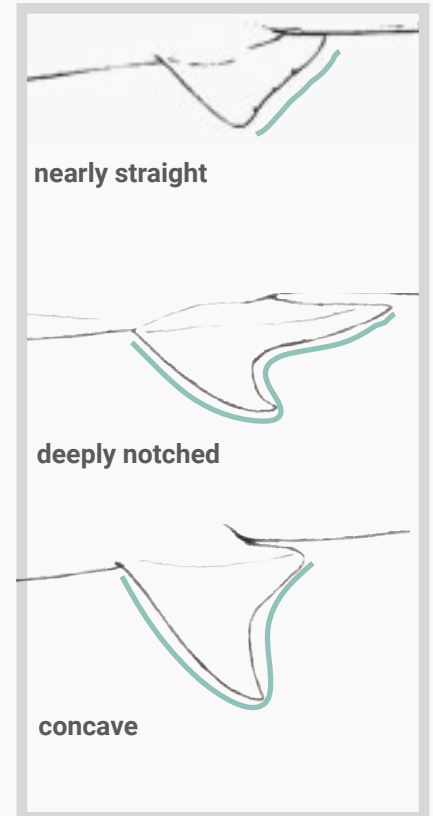
Second dorsal fin apex



Pelvic fins



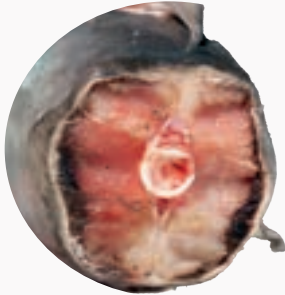
Anal fins



CAUDAL CROSS-SECTION

The following images showcase the typical shapes of caudal cross-sections (at the intersection of the body with the caudal fin): (1) round, (2) laterally compressed, and (3) dorso-ventrally compressed.

Round



Bull shark --
Carcharhinus leucas



Indonesian whaler shark --
Carcharhinus tjutjot

Laterally compressed



Winghead shark -- *Eusphyra blochii*

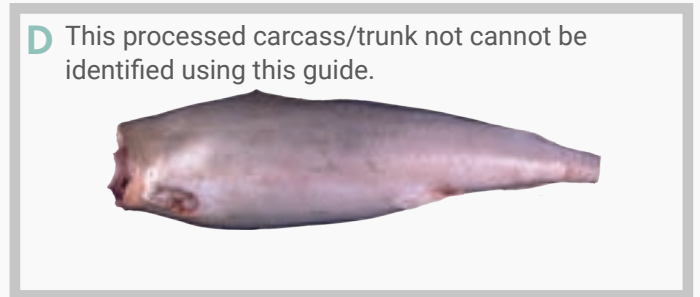
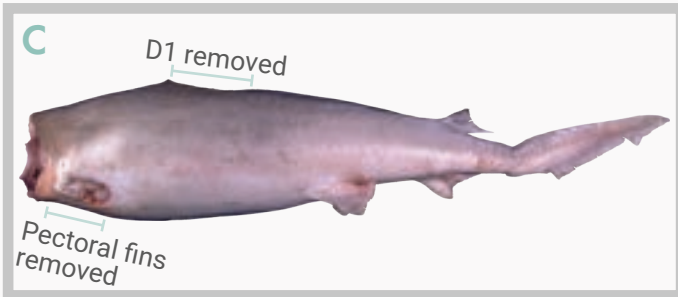
Dorso-ventrally compressed



Giant guitarfish -- *Glaucostegus* spp.

TYPES OF PROCESSED CARCASSES

As mentioned previously, processed carcasses can be found in different forms depending on the country, the trader or trading company, the species, and the demand. They can be full carcasses (picture A - refer to Volume I of this series of guides for the identification of whole animals) or have different fins removed (pictures B and C). In cases where all the fins have been removed (picture D), genetic approaches are required for identification.



START

FLOW CHART

STEP 1

Presence of two dorsal fins?

NO



This is not a CITES-listed species
See page 21 (*Hepranchias perlo*)



YES

STEP 2

Presence of an anal fin?

NO

Is the carcass dorso-ventrally compressed?

NO



This is not a CITES-listed species
See page 25

YES

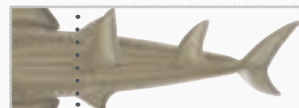


First dorsal fin is before or over the pelvic fins?

YES

Rhynchobatus spp., *Rhina ancylostoma*,
Anoxypristis cuspidata or *Pristis* spp.

See page 22



NO

First dorsal fin is well behind the pelvic fins with distinct large thorns along the mid-line of the dorsal surface?

NO

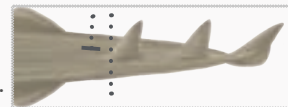


This is not a CITES-listed species

YES

See page 23

Glaucostegus spp.



STEP 3

Presence of spines on the dorsal fins?

YES



This is not a CITES-listed species
See page 25

NO

STEP 4

Presence of prominent lateral keels at the caudal peduncle?

YES

Is the origin of the second dorsal fin before the anal fin origin?

YES

Is there a clear pattern of light-colored spots and vertical lines on a dark body?

YES

See page 26

Rhincodon typus



NO

Is the skin rough, with a creased appearance due to extremely large denticles?

YES

See page 26

Cetorhinus maximus



NO

Does coloration of the dark dorsal surface extend below the lateral keels?

NO

See page 27

Isurus oxyrinchus



YES

Is the anal fin dark in color?

YES

See page 27

Isurus paucus



NO

See page 28

Carcharodon carcharias



NO

Is the origin of the second dorsal fin directly over the anal fin origin?

NO

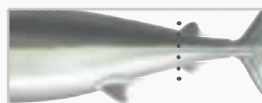
This is not a CITES-listed species



YES

See page 28

Lamna nasus or *L. ditropis*



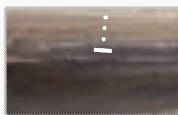
NO

See next page

STEP 5

Presence of an
interdorsal ridge?

YES



NO

See next
page

Is the origin of the
second dorsal fin over or
slightly behind anal fin
origin?

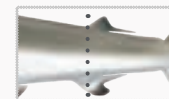
YES

Is the second dorsal fin
free rear tip more than
two times the second
dorsal fin height?

YES

See page 34

Carcharhinus falciformis



NO



This is not a CITES-listed species

See pages 32-33

NO

Is the second dorsal fin
origin before the anal fin
origin?

YES

Is there an obvious
irregular pattern of
stripes along the body?

YES

This is not a
CITES-listed
species



See page 29

Galeocerdo cuvier



NO

Is the anal fin broad with
a moderately rounded
black tipped apex?

NO



This is not a CITES-listed species

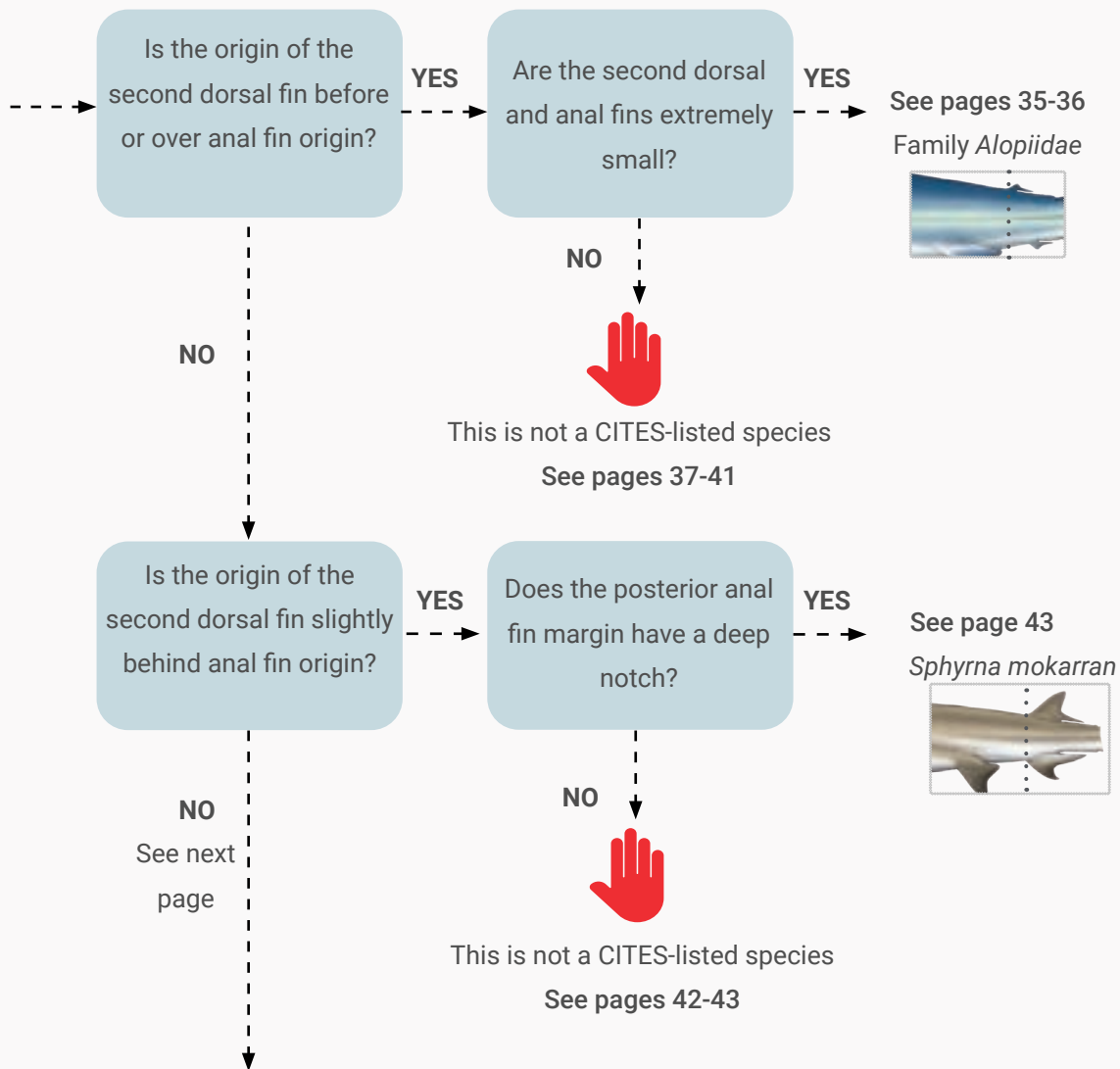
See pages 30-31

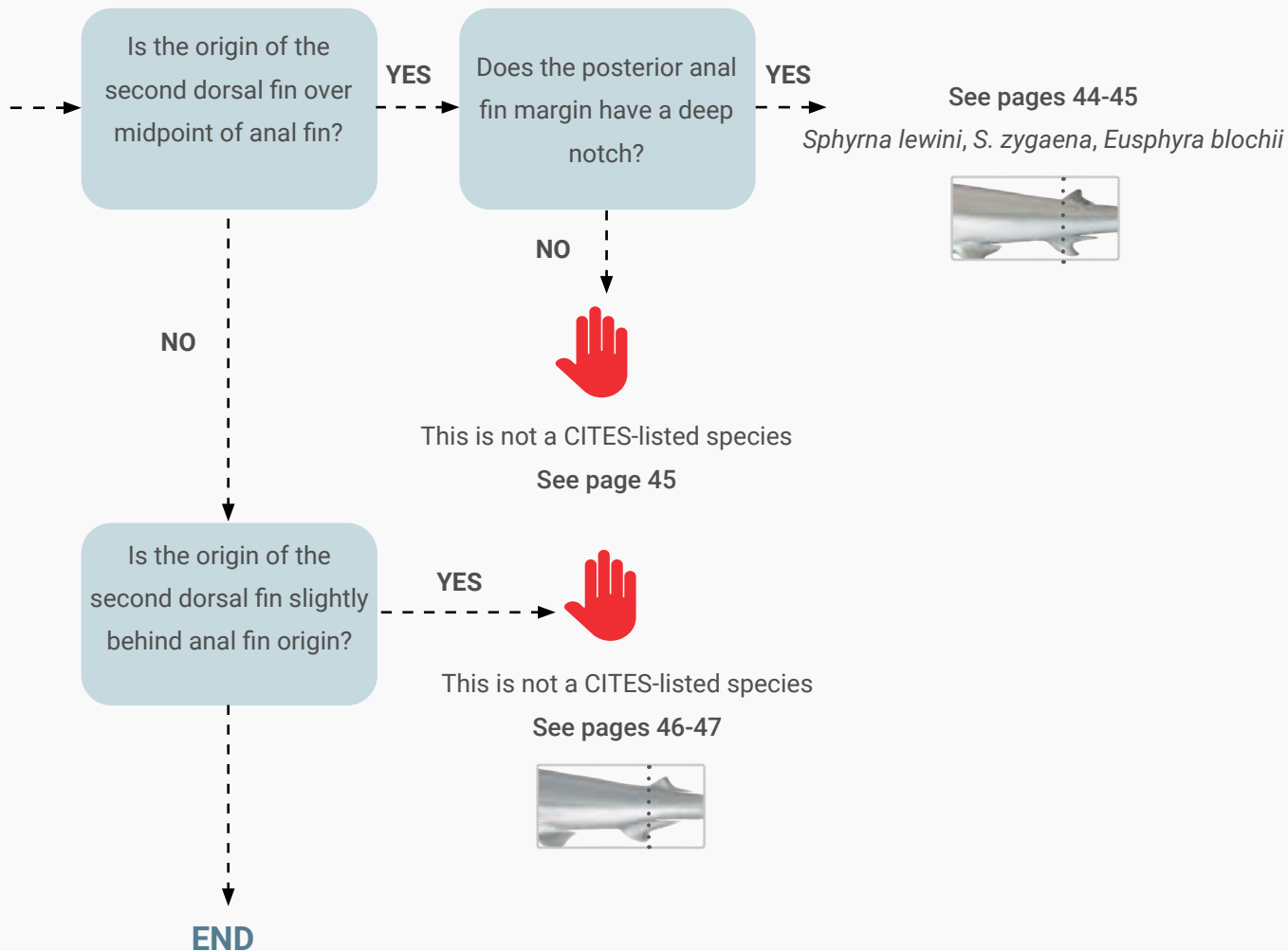
YES

See page 29

Carcharhinus longimanus



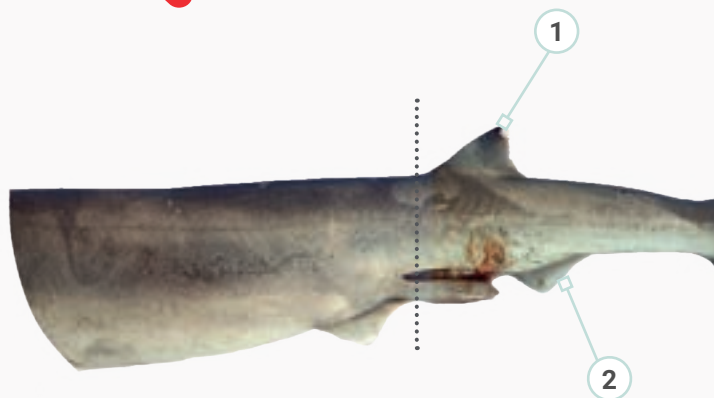




STEP 1 -- Evidence of only one dorsal fin?

SHARPNOSE SEVENGILL SHARK 🚫

Hepranchias perlo



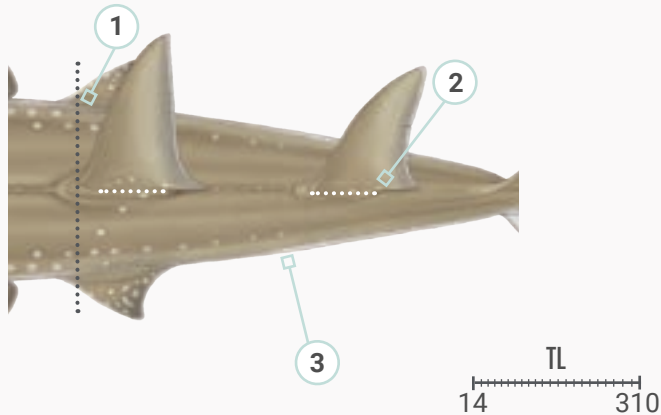
KEY FEATURES

- 1 One dorsal fin present set back behind pelvic fins
- 2 Anal fin present

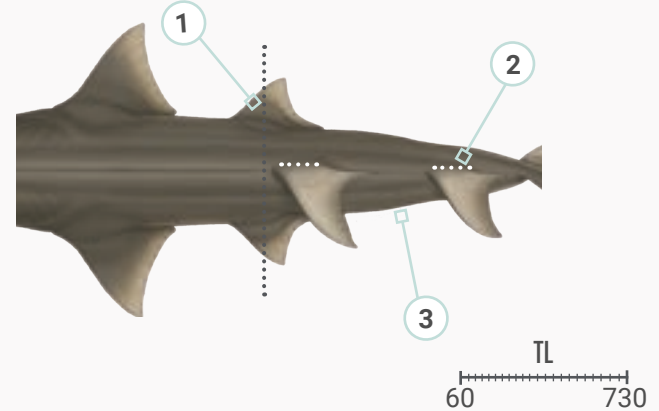
Note -- No CITES-listed species has only one dorsal fin. Inspectors should look for one intact fin or evidence that only one dorsal fin has been removed. The only other species with one dorsal fin are the sixgill sharks (*Hexanchus* spp.), broadnose sevengill shark (*Notorynchus cepedianus*), and frilled shark (*Chlamydoselachus anguineus*).

STEP 2 -- Does the carcass lack an anal fin?

WEDGEFISHES Family Rhinidae



SAWFISHES Family Pristidae



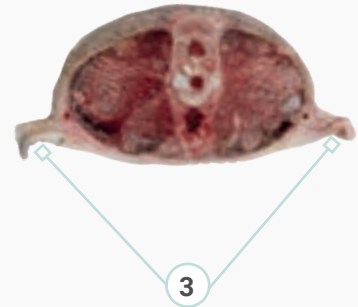
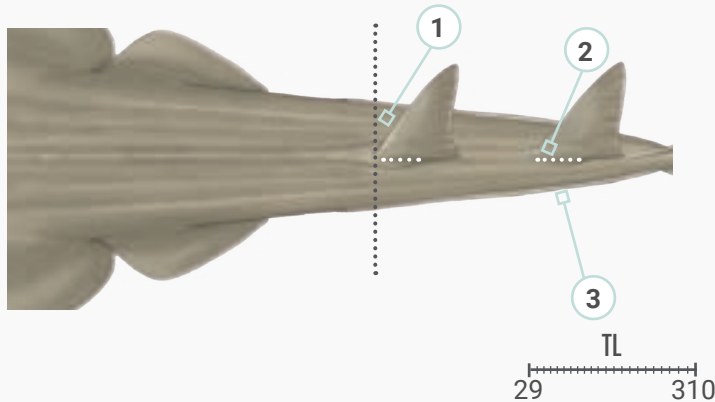
KEY FEATURES

- 1 D1 fin origin over the pelvic fins
- 2 D2 fin base almost as long as first dorsal fin base
- 3 Distinct ridge along both sides of the body that separates the dark dorsal surface coloration from the light ventral surface coloration along the midline of the body

Note -- These characteristics apply to all species of wedgefishes (genus *Rhynchobatus*, *Rhina*, and *Rhynchorhina*) and sawfishes (genus *Pristis* and *Anoxypristis*).

GIANT GUITARFISHES

Family Glaucostegidae



KEY FEATURES

- 1 D1 fin origin well behind the pelvic fin free rear tip
- 2 D2 fin base almost as long as first dorsal fin base
- 3 Distinct ridge along both sides of the body that separates the dark dorsal surface coloration from the light ventral surface coloration along the midline of the body

Note -- Other species that are dorso-ventrally compressed include angel sharks (family Squatinidae), however, they do not have a distinct ridge along the side of the body. **Angel sharks are not listed on CITES.**

STEP 2 -- Does the carcass lack an anal fin?

WEDGEFISHES
Family Rhinidae



Dark dorsal surface coloration

GIANT GUITARFISHES
Family Glaucostegidae



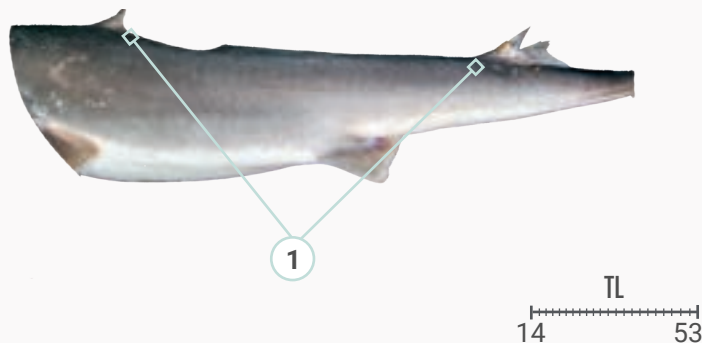
Light ventral coloration

Note -- All Rhinopristiformes (sawfish, wedgefish, giant guitarfish, and guitarfish) have a distinct ridge along both sides of the body that separates the dark dorsal surface coloration from the light ventral coloration. All species of sawfishes and wedgefishes are listed on CITES (Appendix I and II, respectively) and are easily distinguished by checking that the first dorsal fin origin is over the pelvic fins. All species in the family Glaucostegidae (giant guitarfishes) are listed on CITES (Appendix II) and can be distinguished from other guitarfish species by their plain brown dorsal coloration, the size of the denticles on their body, and the row of thorns along the mid-line of the body. Other guitarfish species (e.g., *Rhinobatos* spp., *Acroteriobatus* spp.) **are not listed on CITES**, often have some color patterns (white spots or dark blotches) on the body, a smooth skin texture, and lack a row of prominent thorns along the mid-line of the body.

STEP 3 -- Are dorsal spines present?

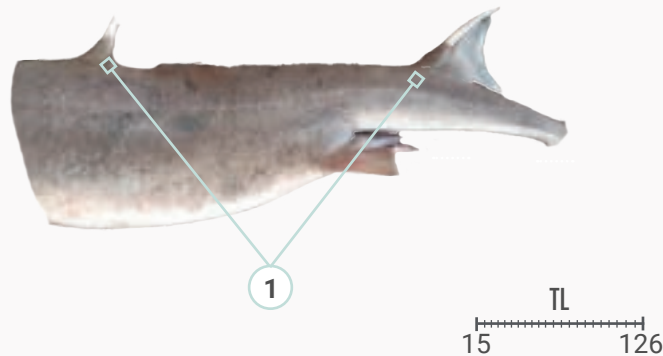
INDONESIAN SHORTSNOUT SPURDOG 🚫

Squalus hemipinnis



MANDARIN SHARK 🚫

Cirrhigaleus barbifer



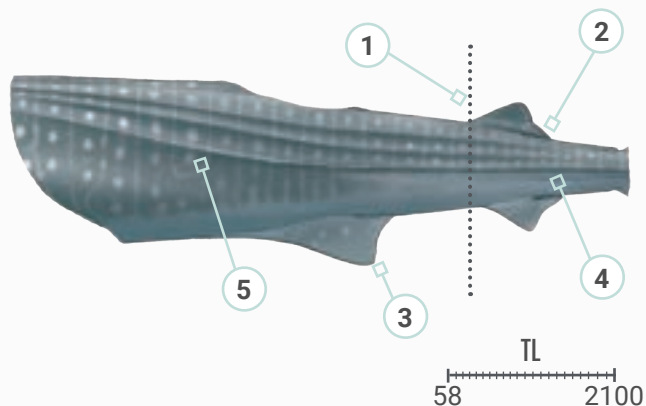
KEY FEATURES

- 1 Dorsal spines on both fins

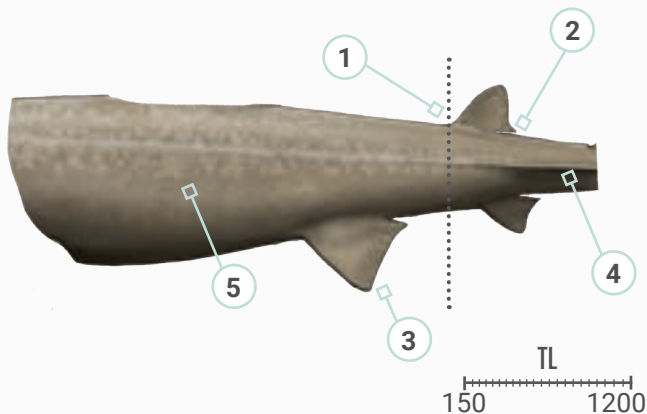
Note -- There are >120 shark species with dorsal spines. The majority belong to the order Squaliformes (e.g., gulper sharks -- family Centrophoridae, dogfish sharks -- family Squalidae) which also lack an anal fin. The remaining species with dorsal spines and an anal fin are horn sharks belonging to the family Heterodontidae. **None of these species are currently listed on CITES.**

STEP 4 -- Presence of prominent lateral keels at the caudal peduncle?

WHALE SHARK
Rhincodon typus



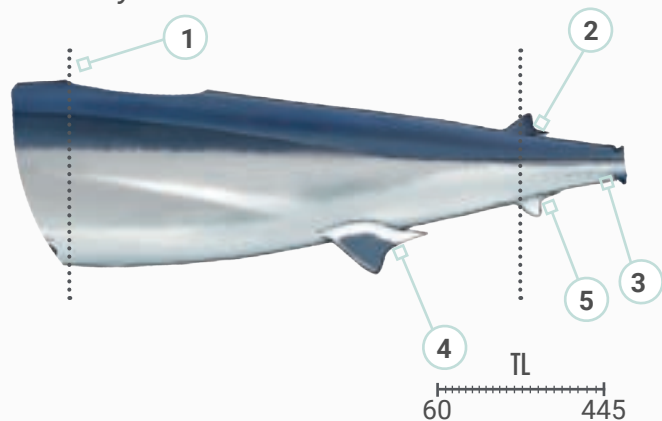
BASKING SHARK
Cetorhinus maximus



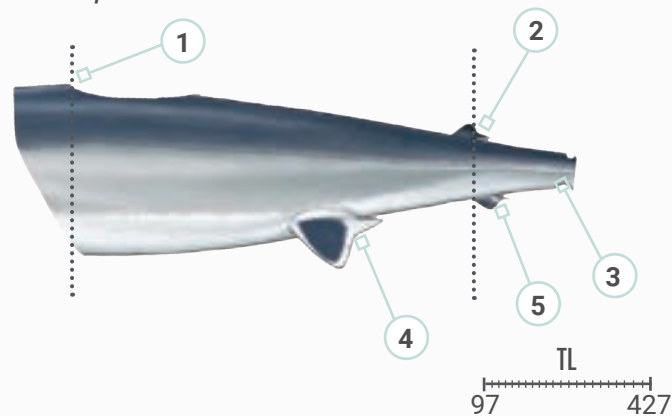
KEY FEATURES

- 1 D2 fin origin before anal fin origin
 - 2 D2 fin and anal fin large, nearly the same size
 - 3 Pelvic fins with nearly straight posterior margin
 - 4 Caudal peduncle depressed with strong fleshy keels on each side
 - 5 Three prominent ridges on dorsal surface and along sides of body
- 4 Strong lateral keels on each side of the caudal peduncle
 - 5 Rough, creased skin with large denticles

SHORTFIN MAKO SHARK *Isurus oxyrinchus*



LONGFIN MAKO SHARK *Isurus paucus*



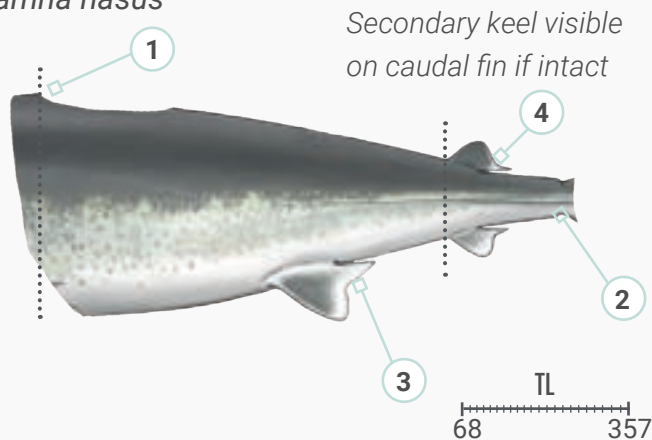
KEY FEATURES

- 1** D1 fin origin over or just behind pectoral fin free rear tip
 - 2** Very small second dorsal and anal fins
 - 3** Strong lateral keel on caudal peduncle
 - 4** Pelvic fins with slightly concave posterior margin
 - 5** Anal fin light in color, origin under mid-base of D2
- 5** Anal fin dark in color, origin almost over D2 insertion, often with dark spots on ventral surface

STEP 4 -- Presence of prominent lateral keels at the caudal peduncle?

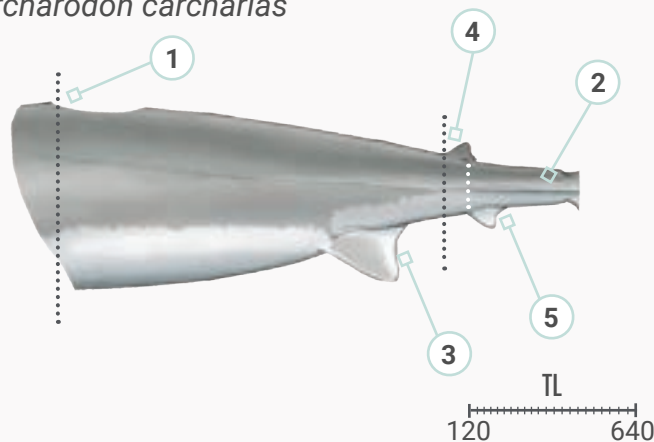
PORBEAGLE SHARK

Lamna nasus



GREAT WHITE SHARK

Carcharodon carcharias



KEY FEATURES

- 1 D1 origin over base or inner margins of pectoral fins
- 2 Strong lateral keel on caudal peduncle
- 3 Pelvic fins with slightly concave posterior margin

- 4 D2 fin small, origin over anal fin origin

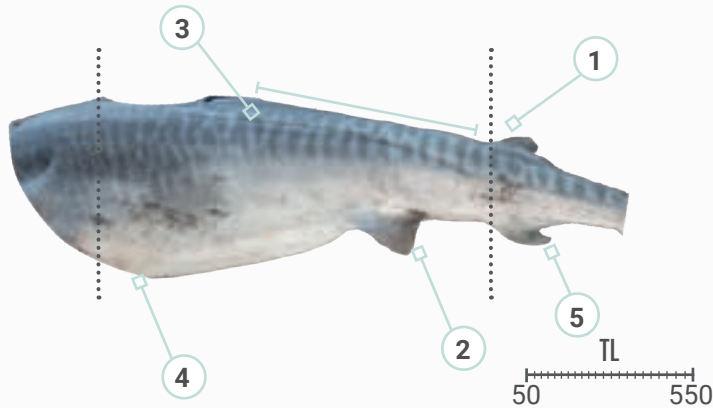
Note -- Could be confused with *Lamna ditropis* (not listed on CITES). Unless you know where the carcass originated (i.e., exporting country), genetics will be required for identification.

- 4 D2 fin small, origin before anal fin origin

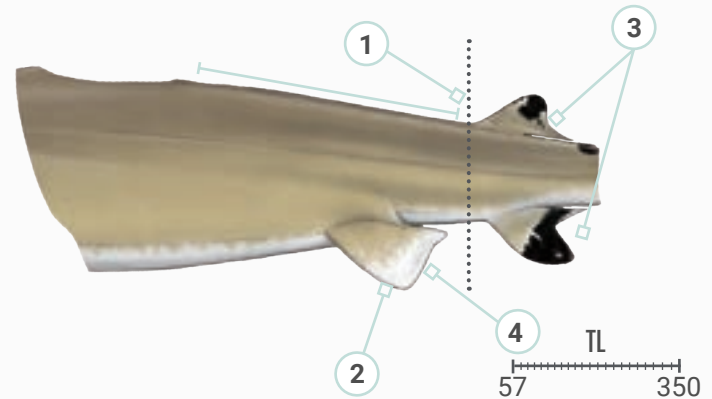
- 5 Anal fin light in color, origin about level with second dorsal fin insertion

STEP 5 -- Presence of an interdorsal ridge? YES

TIGER SHARK 🚫
Galeocerdo cuvier



OCEANIC WHITETIP SHARK
Carcharhinus longimanus



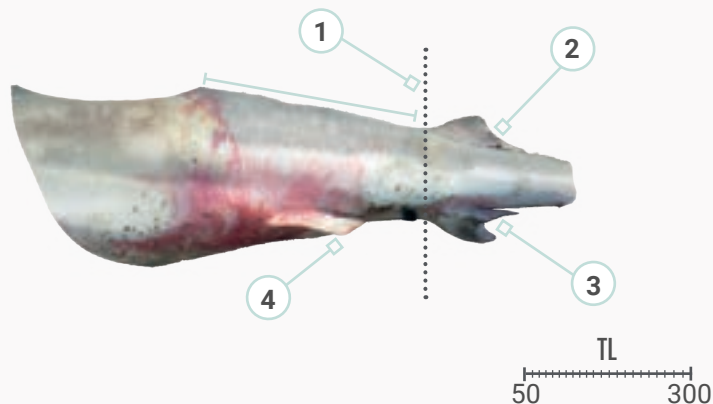
KEY FEATURES

- 1 D2 fin origin slightly before anal fin origin
- 2 Pelvic fins with nearly straight posterior margin
- 3 Dorsal surface with irregular pattern of stripes, prominent in juveniles but fades in adults
- 4 D1 fin origin over pectoral fin insertions
- 5 Anal fin almost same size as second dorsal fin, dusky in color with deep notch

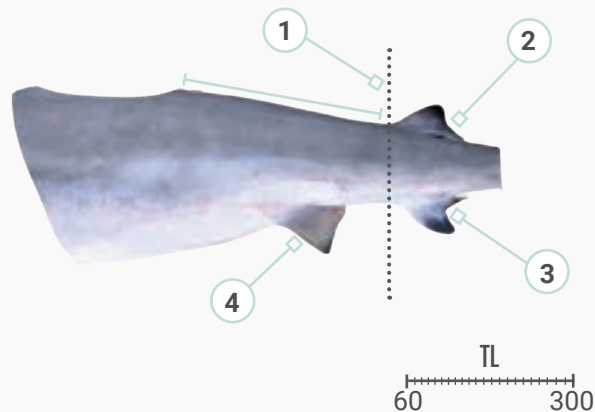
- 3 D2 fin and anal fin moderately rounded with some black tips, sometimes with a dark blotch under D2
- 4 Pelvic fins mottled white in adults (some black tips in juveniles)

STEP 5 -- Presence of an interdorsal ridge? YES

SANDBAR SHARK 🚫
Carcharhinus plumbeus



BIGNOSE SHARK 🚫
Carcharhinus altimus



KEY FEATURES

1 D2 fin origin before or over anal fin origin

2 D2 fin moderately high

3 Anal fin typically pale and uniform in color with deep notch

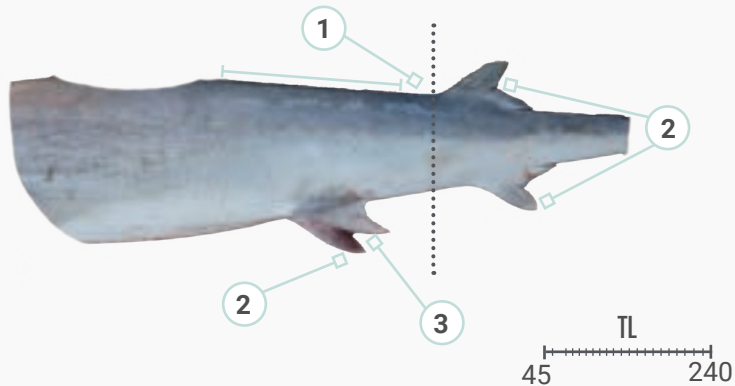
4 Pelvic fins uniform in color with no obvious markings, nearly straight posterior margin

2 D2 fin high with short free rear tip

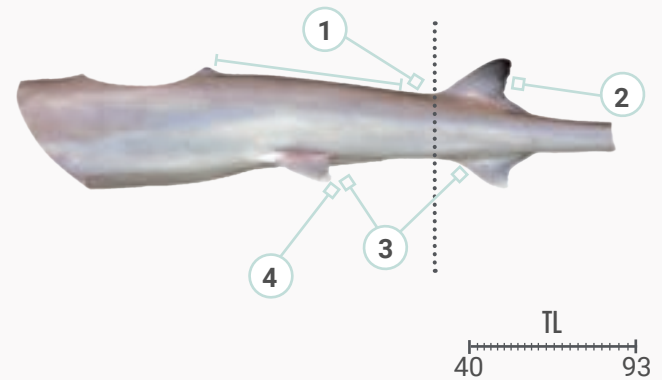
3 Anal fin with deep notch, slightly larger than D2 fin, both with dusky markings at the apex

4 Pelvic fins uniform in color with no obvious markings with nearly straight posterior margin

SNAGGLETEOTH SHARK 🛑
Hemipristis elongata



STRAIGHT-TOOTH WEASEL SHARK 🛑
Paragaleus tengi



KEY FEATURES

1 D2 fin origin before or over anal fin origin

2 D2 and anal fins strongly concave and notched

3 Pelvic fins with strongly concave posterior margin

2 D2 fin moderately tall, larger than anal fin

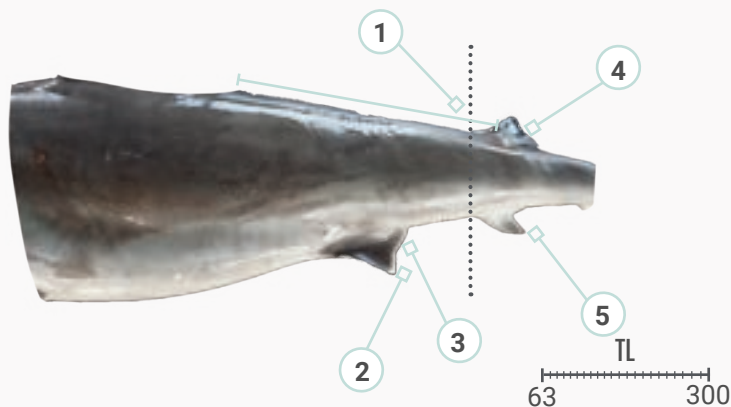
3 D2 and anal fins not strongly concave

4 Pelvic fins with nearly straight posterior margin

STEP 5 -- Presence of an interdorsal ridge? YES

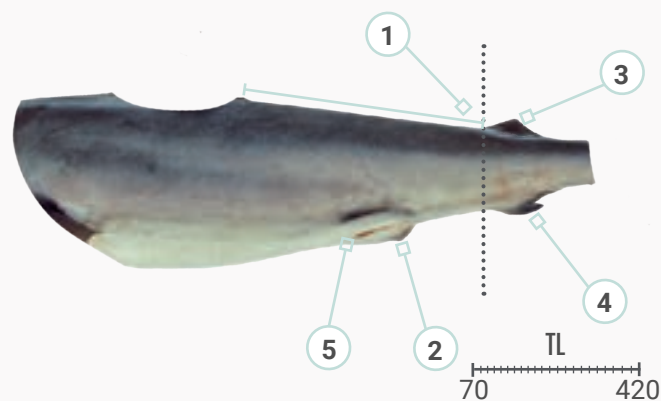
SILVERTIP SHARK 🚫

Carcharhinus albimarginatus



DUSKY SHARK 🚫

Carcharhinus obscurus



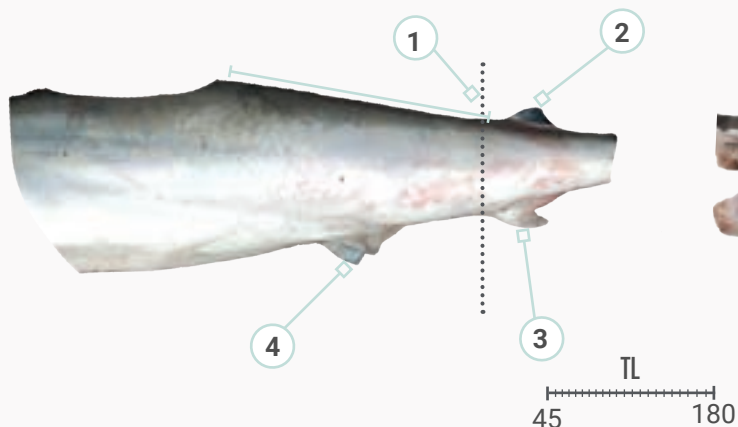
KEY FEATURES

- 1 D2 origin over or slightly behind anal fin origin
- 2 Pelvic fins with slightly concave posterior margin

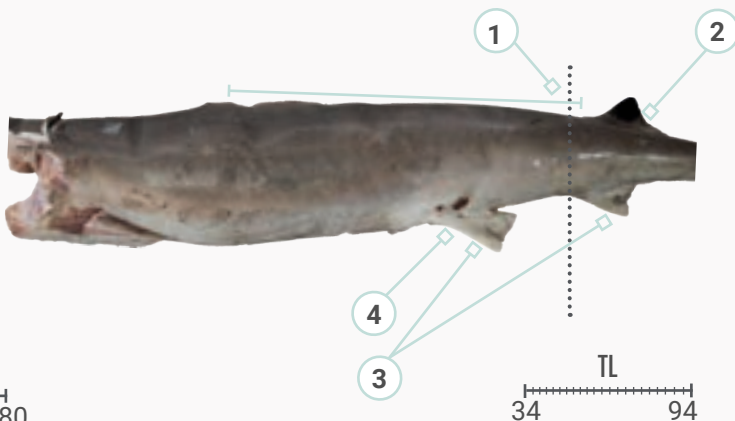
- 3 Fins with conspicuous white trailing edges
- 4 D2 moderately high, dark or dusky in color except light along the fin base
- 5 Anal fin also lightly dusky in color except the white trailing edges, similar in size to D2 fin

- 3 D2 fin small and low, free rear tip moderately long but not more than twice the fin height
- 4 Anal fin larger than D2 fin, and dusky in color at apex
- 5 Pelvic fins typically uniform in color with no obvious markings

SPOTTAIL SHARK 🚫
Carcharhinus sorrah



INDONESIAN WHALER SHARK 🚫
Carcharhinus tjutjot



KEY FEATURES

1 D2 fin origin slightly behind anal fin origin

2 D2 fin black-tipped, very low with extremely long inner margin (more than twice fin height)

3 Anal fin moderately pointed, can be light or dusky in coloration depending on the specimen

4 Pelvic fins with slightly concave posterior margin

2 D2 fin low, small, not falciform, with black tip covering about half of fin

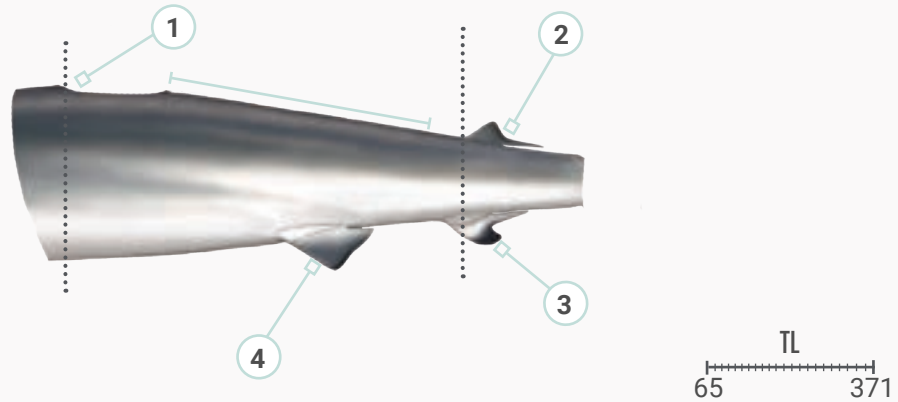
3 Other fins uniform with no obvious markings

4 Pelvic fins moderately pointed, with nearly straight posterior margin

STEP 5 -- Presence of an interdorsal ridge? YES

SILKY SHARK

Carcharhinus falciformis

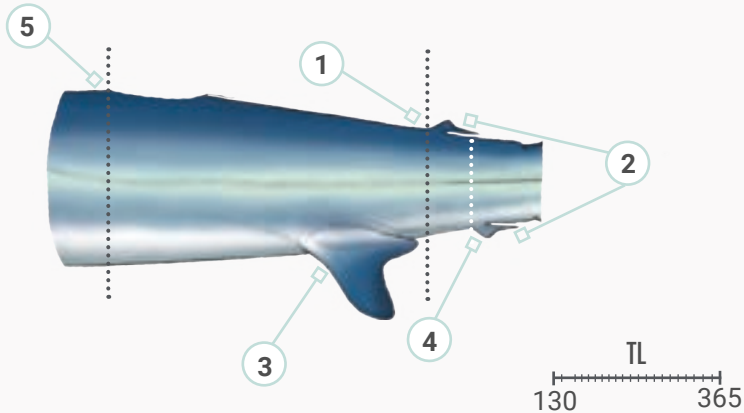


KEY FEATURES

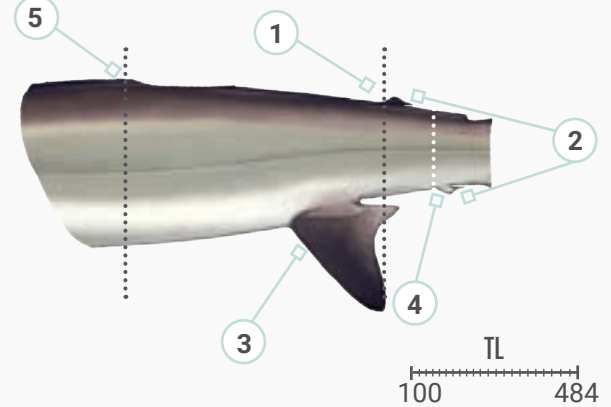
- 1 D1 fin origin well behind pectoral fin rear tip
- 2 D2 fin low, dusky at apex, origin slightly behind anal fin origin, its free rear tip more than 2 times its height
- 3 Anal fin falciform, dusky at apex
- 4 Small pelvic fins with nearly straight posterior margin, dusky in color

STEP 5 -- Presence of an interdorsal ridge? NO

PELAGIC THRESHER
Alopias pelagicus



BIGEYE THRESHER
Alopias superciliosus



KEY FEATURES

- 1 D2 fin origin before or over anal fin origin
- 2 D2 fin and anal fin very small
- 3 Pelvic fins large with strongly concave posterior margin
- 4 Anal fin origin behind rear margin of D2 fin

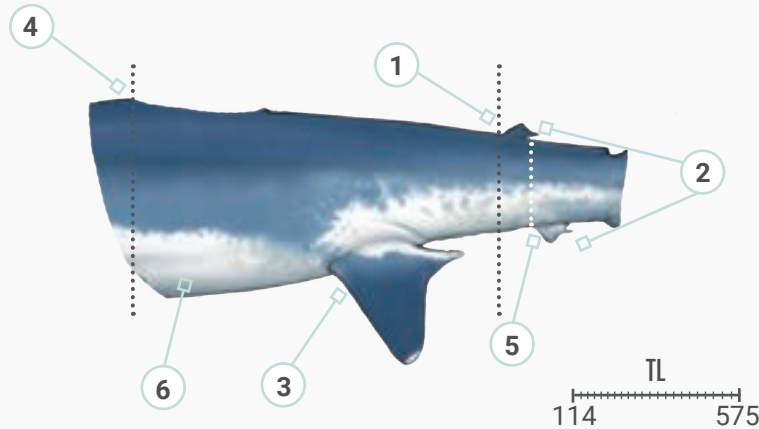
- 5 D1 fin origin closer to pectoral fin rear tip than pelvic fin base

- 5 D1 fin closer to pelvic fin base than pectoral fin rear tip

STEP 5 -- Presence of an interdorsal ridge? NO

COMMON THRESHER

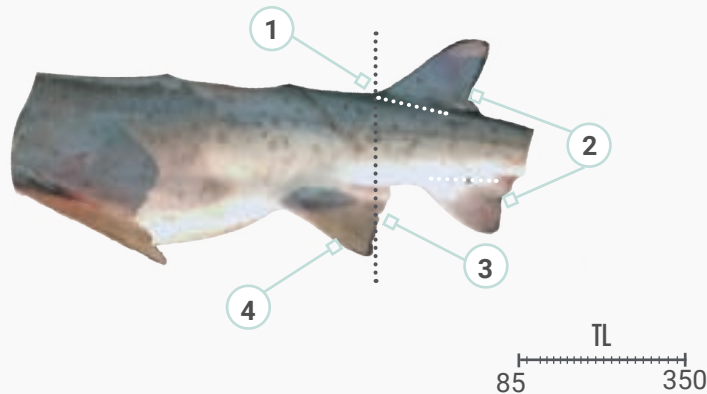
Alopias vulpinus



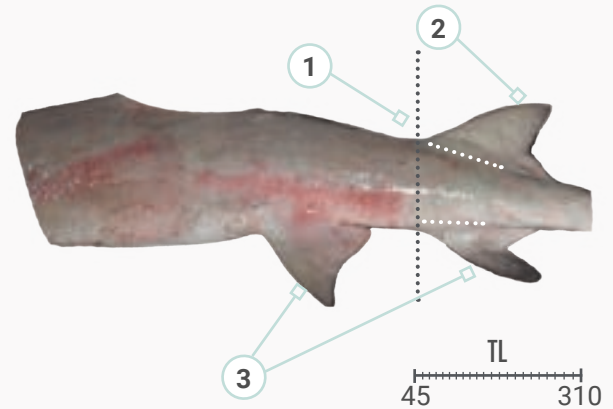
KEY FEATURES

- 1 D2 fin origin before or over anal fin origin
- 2 D2 fin and anal fin very small
- 3 Pelvic fins large with strongly concave posterior margin
- 4 D1 fin origin closer to pectoral fin rear tip than pelvic fin origin
- 5 Anal fin origin behind rear margin of D2 fin
- 6 White patches on ventral surface extend above pectoral fins and typically above pelvic fins

SAND TIGER SHARK 🛑
Carcharias taurus



SHARPTOOTH LEMON SHARK 🛑
Negaprion acutidens

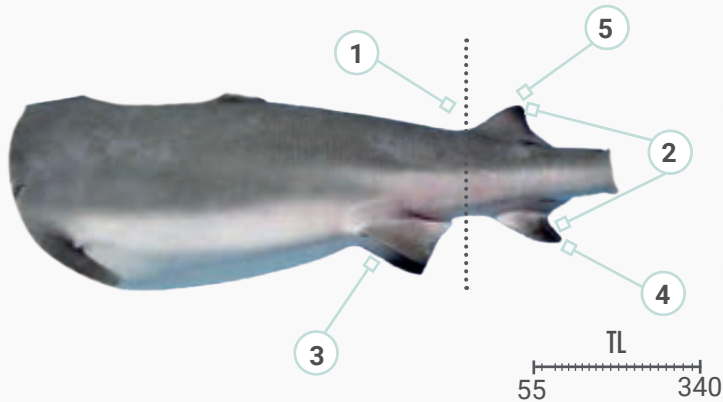


KEY FEATURES

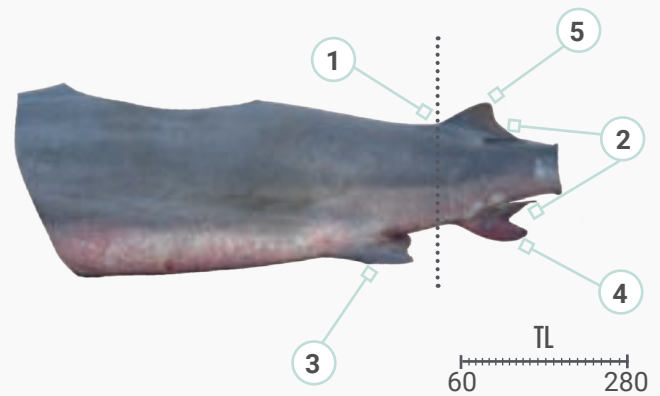
- 1 D2 fin origin before or over anal fin origin
 - 2 D2 fin and anal fin large, similar in size and broad-based
 - 3 D2 fin origin closer to the free rear tips of pelvic fins than to anal fin origin
 - 4 Large pelvic fins with nearly straight posterior margin
- 2 D2 fin tall and broad-based, with pointed apex
 - 3 Pelvic fins and anal fin with strongly concave posterior margin, pointed at the apex

STEP 5 -- Presence of an interdorsal ridge? NO

BULL SHARK 🛑
Carcharhinus leucas



PIGEYE SHARK 🛑
Carcharhinus amboinensis

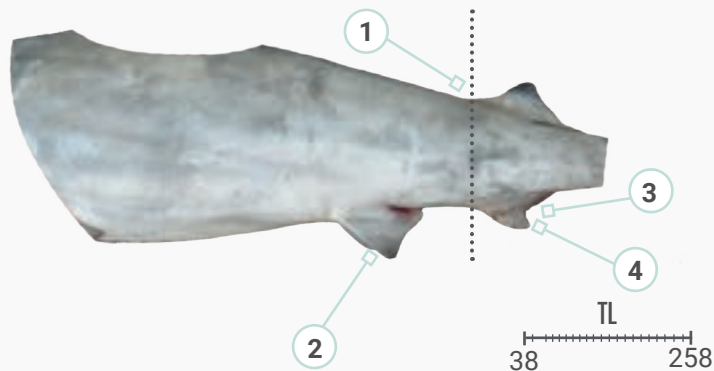


KEY FEATURES

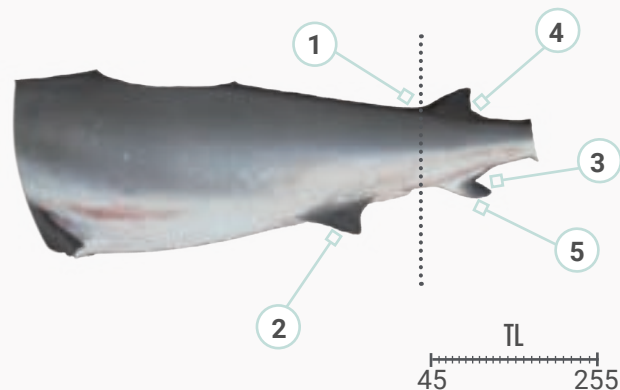
- 1 D2 fin origin before or over anal fin origin
- 2 D2 fin relatively large, similar in size to the anal fin
- 3 Pelvic fins with nearly straight posterior margin
- 4 Notch on posterior margin of anal fin not acute (usually 90° or more)
- 5 D2 fin with concave upper margin and short rear tips

- 4 Anal fin with deep notch in rear margin (with dusky tips in juveniles)
- 5 D2 fin with nearly straight upper margin and short free rear tips

BLACKTIP SHARK 🚫
Carcharhinus limbatus



GREY REEF SHARK 🚫
Carcharhinus amblyrhynchos



KEY FEATURES

- 1 D2 fin origin before or over anal fin origin
- 2 Pelvic fins with nearly straight posterior margin
- 3 Anal fin posterior margin with deep notch

- 4 Most fins with black tips except anal fin which is uniform in color

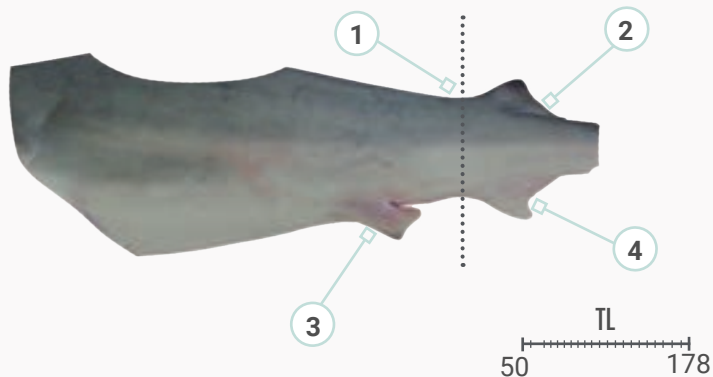
NB -- regional variations have been noted in the position of D2.

- 4 D2 fin large, with short free rear tip
- 5 Anal fin similar in size as D2 fin

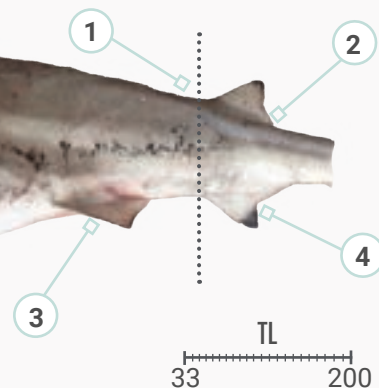
NB -- this species may sometimes have a weak interdorsal ridge.

STEP 5 -- Presence of an interdorsal ridge? NO

GRACEFUL SHARK 🛑
Carcharhinus amblyrhynchoides



BLACKTIP REEF SHARK 🛑
Carcharhinus melanopterus



KEY FEATURES

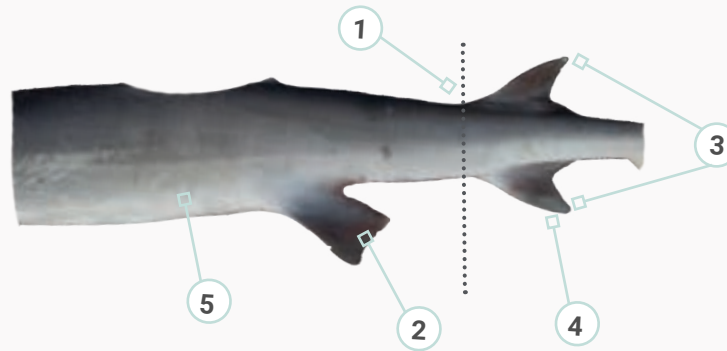
- 1 D2 fin origin before or over anal fin origin
- 2 D2 fin moderately large, with short free rear tip
- 3 Pelvic fins with nearly straight posterior margin

- 4 All fins usually black or dusky except anal fin

- 4 All fins usually black or dusky including anal fin

WHITETIP REEF SHARK 🚫

Triaenodon obesus



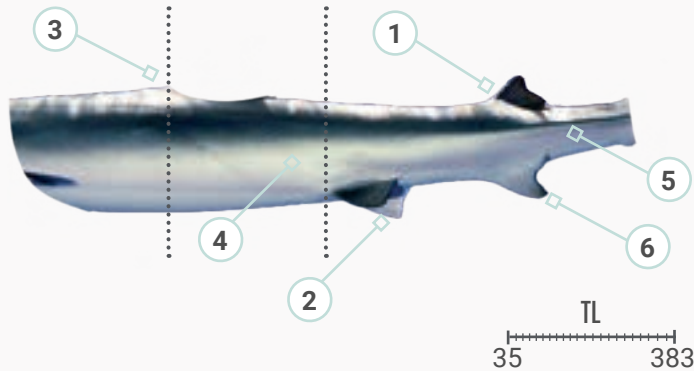
TL
52 170

KEY FEATURES

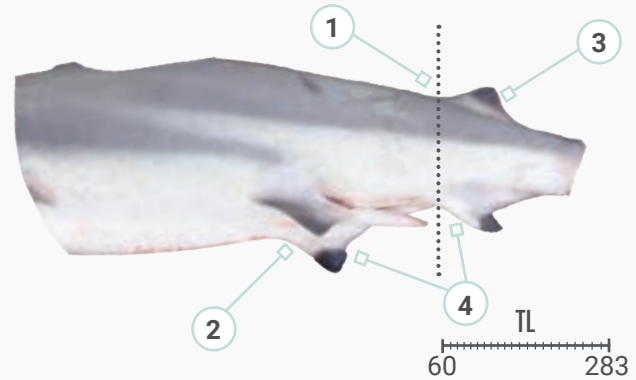
- 1 D2 fin origin before or over anal fin origin
- 2 Pelvic fins with nearly straight posterior margin
- 3 D2 fin about the same size as anal fin, white in coloration at apex
- 4 Anal fin dark in color, moderately pointed at apex
- 5 Scattered dark spots sometimes present on the sides of the body

STEP 5 -- Presence of an interdorsal ridge? NO

BLUE SHARK 🚫
Prionace glauca



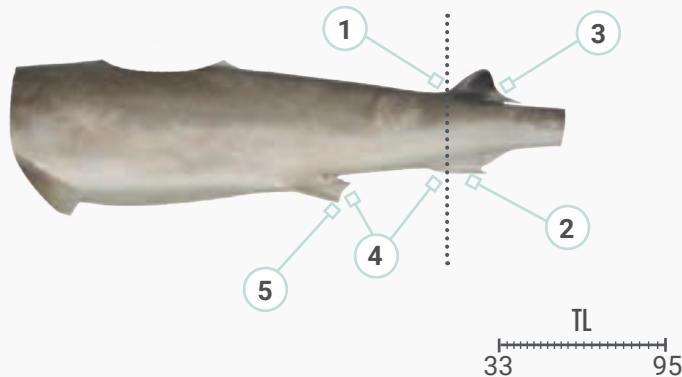
SPINNER SHARK 🚫
Carcharhinus brevipinna



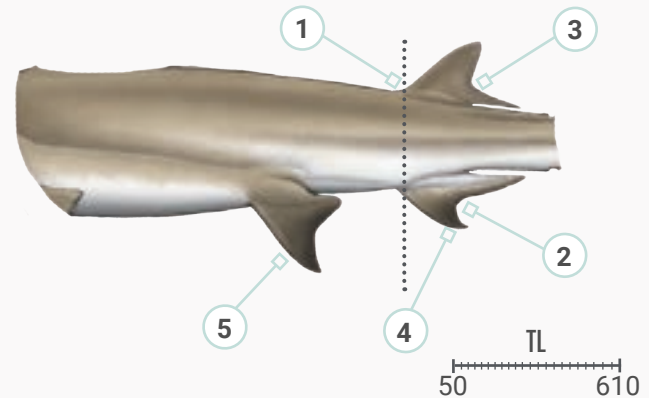
KEY FEATURES

- 1 D2 origin slightly behind anal fin origin
 - 2 Pelvic fins with nearly straight posterior margin
 - 3 D1 fin origin well behind pectoral fins
 - 4 Dorsal surface deep iridescent blue in color, fading into white ventral surface
 - 5 Weak lateral keels present
 - 6 Anal fin dusky to dark tipped with deep notch
- 3 D2 fin moderately pointed at apex with short free rear tip
 - 4 Most fins with black tips in adults (look like they have been dipped in ink) but with no obvious markings in specimens under 80 cm total length

BLACKSPOT SHARK 🚫
Carcharhinus sealei



GREAT HAMMERHEAD
Sphyrna mokarran



KEY FEATURES

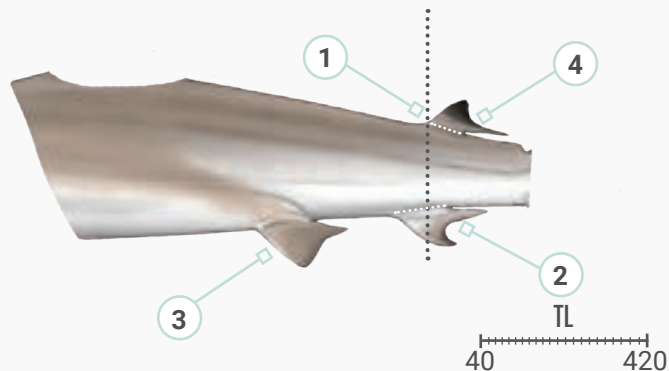
- 1 D2 origin slightly behind anal fin origin
- 2 Anal fin posterior margin with deep notch
- 3 D2 fin small, moderately rounded at apex with conspicuous dusky to black tip (covering more than half of fin, often extending onto body)
- 4 Pelvic fin and anal fin with no obvious markings
- 5 Pelvic fins with nearly straight posterior margin

- 3 D2 fin tall, with deep notch, and short free rear tip not reaching upper caudal fin origin
- 4 Anal fin equal to or larger than second dorsal fin
- 5 Pelvic fins with strongly concave posterior margin, pointed at the apex

STEP 5 -- Presence of an interdorsal ridge? NO

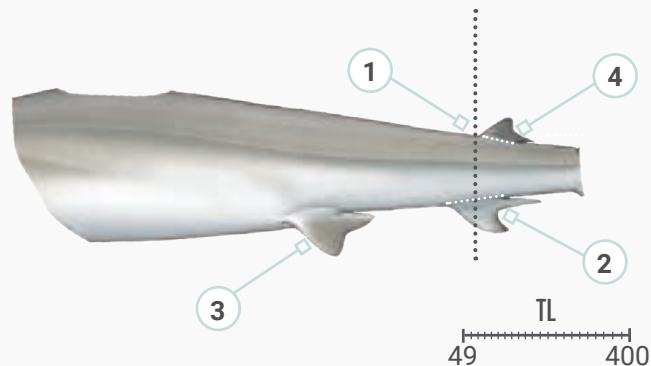
SCALLOPED HAMMERHEAD

Sphyrna lewini



SMOOTH HAMMERHEAD

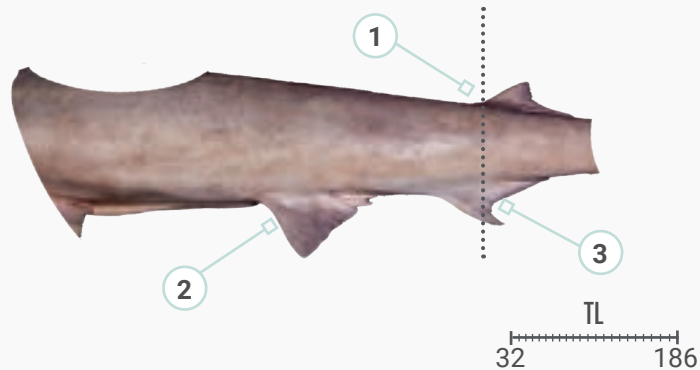
Sphyrna zygaena



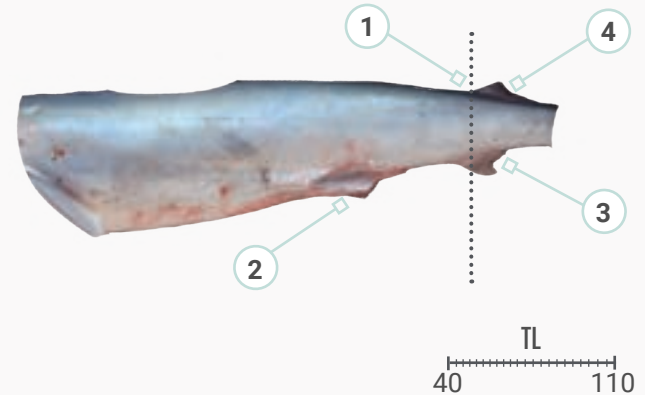
KEY FEATURES

- 1 D2 fin origin above midbase of anal fin
- 2 Anal fin base larger than D2 fin base, posterior margin with deep notch
- 3 Pelvic fins with nearly straight posterior margin
- 4 D2 fin small, with free rear tips almost reaching upper caudal fin origin, dark or dusky in color at the apex
- 4 D2 fin small, with short free rear tip not reaching upper caudal fin origin

WINGHEAD SHARK 🛑
Eusphyra blochii



HARDNOSE SHARK 🛑
Carcharhinus macroti



KEY FEATURES

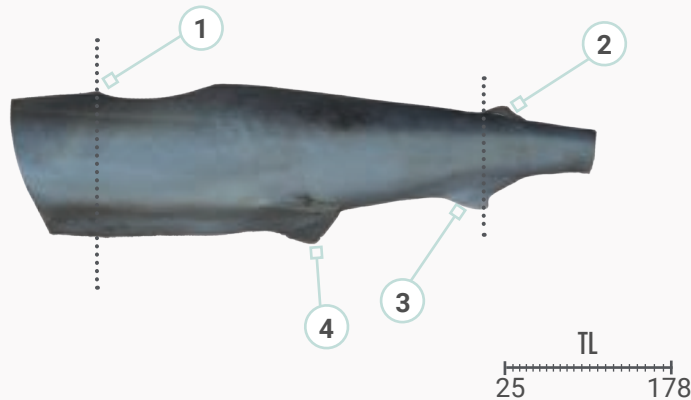
- 1 D2 fin small, origin above midbase of anal fin
- 2 Pelvic fins with nearly straight posterior margin

- 3 Anal fin posterior margin with deep notch

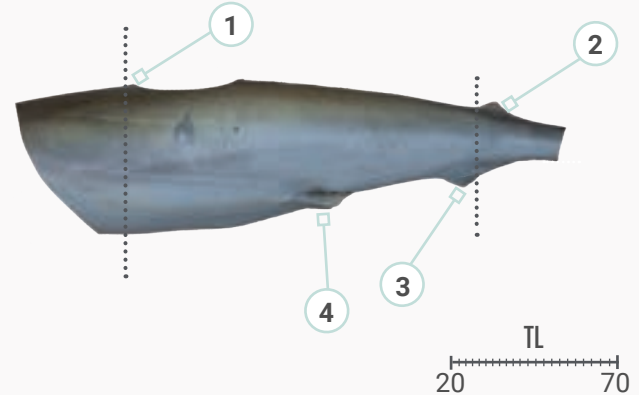
- 3 Anal fin posterior margin not deeply notched
- 4 D2 low with very long free rear tips

STEP 5 -- Presence of an interdorsal ridge? NO

MILK SHARK 🚫
Rhizoprionodon acutus



GREY SHARPNOSE SHARK 🚫
Rhizoprionodon oligolinx

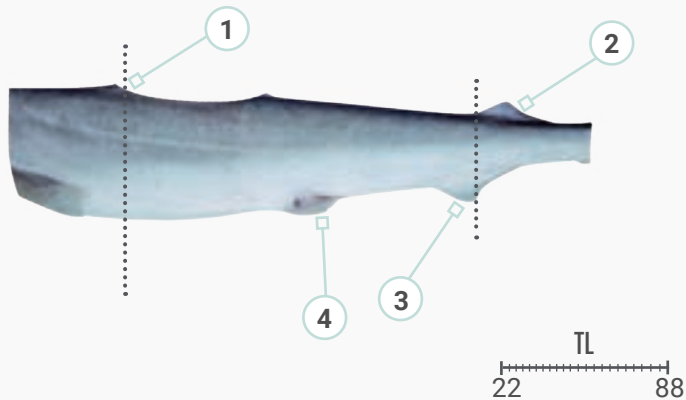


KEY FEATURES

- 1 D1 fin origin well behind pectoral fin free rear tips
- 2 D2 fin smaller than anal fin, with origin behind origin of anal fin
- 3 Anal fin larger than D2 fin, tips pale or light in color
- 4 Pelvic fins with nearly straight posterior margin, tips pale or light in color

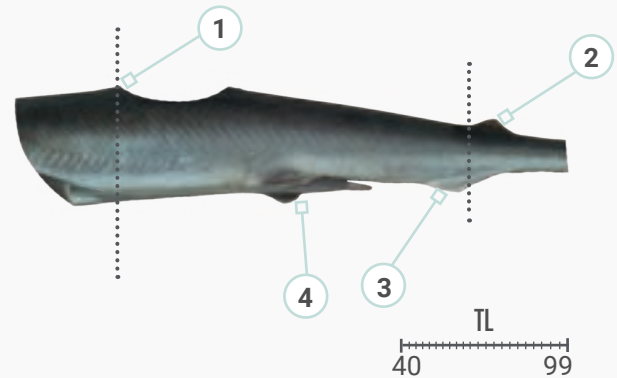
AUSTRALIAN SHARPNOSE SHARK 🚫

Rhizoprionodon taylori



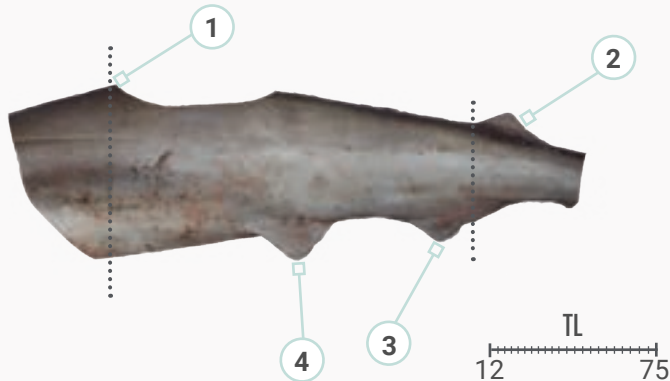
SLITEYE SHARK 🚫

Loxodon macrorhinus



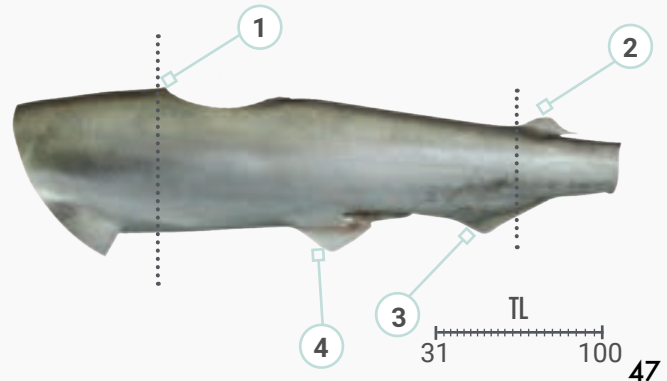
SPADENOSE SHARK 🚫

Scoliodon laticaudus



PACIFIC SPADENOSE SHARK 🚫

Scoliodon macrorhynchus



REFERENCE GUIDE TO SPECIES

STEPS AND SPECIES	CITES listed (Yes/No)	Page number
STEP 1: Evidence of only one dorsal fin		
If yes, STOP. This is not a CITES-listed species	No	21
STEP 2: No anal fin		
Body is dorso-ventrally compressed		
<i>Rhynchobatus</i> spp., <i>Rhina ancylostoma</i> , <i>Rhynchorhina mauritaniensis</i>	Yes	22
<i>Anoxypristis cuspidata</i> , <i>Pristis</i> spp.	Yes	22
<i>Glaucostegus</i> spp.	Yes	23
Squatinidae (Angel sharks)	No	See note on page 23
Body is NOT dorso-ventrally compressed		
Pristiophoriformes (sawsharks)	No	Species not included in this guide
<i>Chiloscyllium</i> spp. (bamboo sharks)	No	
STEP 3: Presence of spines on dorsal fins		
If yes, STOP. This is not a CITES-listed species	No	25

STEPS AND SPECIES	CITES listed (Yes/No)	Page number
STEP 4: Presence of prominent lateral keels at the caudal peduncle		
D2 origin before anal fin origin		
Whale shark -- <i>Rhincodon typus</i>	Yes	26
Basking shark -- <i>Cetorhinus maximus</i>	Yes	26
Shortfin mako -- <i>Isurus oxyrinchus</i>	Yes	27
Longfin mako -- <i>Isurus paucus</i>	Yes	27
Porbeagle shark -- <i>Lamna nasus</i>	Yes	28
Salmon shark -- <i>Lamna ditropis</i>	No	See note on page 28
Great white shark -- <i>Carcharodon carcharias</i>	Yes	28

STEP 5A: Interdorsal ridge present		
D2 origin before or over anal fin origin		
Tiger shark -- <i>Galeocerdo cuvier</i>	No	29
Oceanic whitetip shark -- <i>Carcharhinus longimanus</i>	Yes	29
Sandbar shark -- <i>Carcharhinus plumbeus</i>	No	30
Bignose shark -- <i>Carcharhinus altimus</i>	No	30
Snaggletooth shark -- <i>Hemipristis elongata</i>	No	31
Straight-tooth weasel shark -- <i>Paragaleus tengi</i>	No	31

STEPS AND SPECIES	CITES listed (Yes/No)	Page number
D2 origin over or slightly behind anal fin origin		
Silvertip shark -- <i>Carcharhinus albimarginatus</i>	No	32
Dusky shark -- <i>Carcharhinus obscurus</i>	No	32
Spottail shark -- <i>Carcharhinus sorrah</i>	No	33
Indonesian whaler shark -- <i>Carcharhinus tjutjot</i>	No	33
Silky shark -- <i>Carcharhinus falciformis</i>	Yes	34

STEP 5B: Interdorsal ridge absent

D2 origin before or over anal fin origin		
Pelagic thresher -- <i>Alopias pelagicus</i>	Yes	35
Bigeye thresher -- <i>Alopias superciliosus</i>	Yes	35
Common thresher -- <i>Alopias vulpinus</i>	Yes	36
Sand tiger shark -- <i>Carcharias taurus</i>	No	37
Sharptooth lemon shark -- <i>Negaprion acutidens</i>	No	37
Bull shark -- <i>Carcharhinus leucas</i>	No	38
Pigeye shark -- <i>Carcharhinus amboinensis</i>	No	38
Blacktip shark -- <i>Carcharhinus limbatus</i> *	No	39
Grey reef shark -- <i>Carcharhinus amblyrhynchos</i>	No	39
Graceful shark -- <i>Carcharhinus amblyrhynchoides</i>	No	40
Blacktip reef shark -- <i>Carcharhinus melanopterus</i>	No	40

STEPS AND SPECIES	CITES listed (Yes/No)	Page number
Whitetip reef shark -- <i>Triaenodon obesus</i>	No	40
D2 origin slightly behind anal fin origin		
Blue shark -- <i>Prionace glauca</i>	No	42
Spinner shark -- <i>Carcharhinus brevipinna</i> *	No	42
Blackspot shark -- <i>Carcharhinus sealei</i>	No	43
Great hammerhead -- <i>Sphyrna mokarran</i>	Yes	43
D2 origin over midbase of anal fin		
Scalloped hammerhead -- <i>Sphyrna lewini</i>	Yes	44
Smooth hammerhead -- <i>Sphyrna zygaena</i>	Yes	44
Winghead shark -- <i>Eusphyra blochii</i>	No	45
Hardnose shark -- <i>Carcharhinus macroti</i>	No	45
D2 origin behind anal fin insertion		
Milk shark -- <i>Rhizoprionodon acutus</i>	No	46
Grey sharpnose shark -- <i>Rhizoprionodon oligoinx</i>	No	46
Australian sharpnose shark -- <i>Rhizoprionodon taylori</i>	No	47
Sliteye shark -- <i>Loxodon macrorhinus</i>	No	47
Spadenose shark -- <i>Scoliodon laticaudus</i>	No	47
Pacific spadenose shark -- <i>Scoliodon macrorhynchus</i>	No	47

* Regional variations in the position of D2 have been noted with species in the 'blacktip complex' such as the blacktip shark (*Carcharhinus limbatus*) and the spinner shark (*Carcharhinus brevipinna*). Inspectors need to be cautious when assigning processed carcasses to these species depending on the region they are working in.

SPECIES PLATES

The following pages are provided to showcase the various types of processed carcasses recorded during surveys in Indonesia. Pages 52–53 showcase common species that are **not CITES-listed** while page 54 showcases several **CITES-listed** species. Frozen processed carcasses might be challenging to identify with some features difficult to discern (e.g., interdorsal ridge, colouration). While wiping the ice off a carcass or soaking it for a couple of minutes in water would allow better visual support, this might be difficult due to the time limitation associated with inspecting large quantities of carcasses. However, this is recommended if inspectors suspect a trunk to originate from a CITES-listed species.

SPOTTAIL SHARK -- *Carcharhinus sorrah*



SHARPTOOTH LEMON SHARK -- *Negaprion acutidens*



BLUE SHARK -- *Prionace glauca*



BULL SHARK -- *Carcharhinus leucas*



HARDNOSE SHARK -- *Carcharhinus macroti*



SNAGGLETEOTH SHARK -- *Hemipristis elongata*



INDONESIAN WHALER SHARK -- *Carcharhinus tjutjot*



STRAIGHT-TOOTH WEASEL SHARK -- *Paragaleus tengi*



WINGHEAD SHARK -- *Eusphyra blochii*



AUSTRALIAN SHARPNOSE SHARK -- *Rhizoprionodon taylori*



PELAGIC THRESHER -- *Alopias pelagicus*



SCALLOPED HAMMERHEAD -- *Sphyrna lewini*



GIANT GUITARFISH -- *Glaucostegus typus*



SCALLOPED HAMMERHEAD -- *Sphyrna lewini*



SHORTFIN MAKO SHARK -- *Isurus oxyrinchus*



PHOTOGRAPHS IN THE FIELD

It is often important to take photographs while in the field to confirm species identification. Below are the key four photographs that should be taken: (A) whole carcass (lateral view); (B) dorsal view (to determine if there is an interdorsal ridge, to see lateral keels and lateral ridge of guitarfishes); (C) close up of the position of D2 and anal fin in lateral view; and (D) caudal-cranial view to show the caudal cross-section.

A



B



C



D



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 while commercial trade is prohibited.
- **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 only if the appropriate document has been obtained and presented for clearance at the port of entry and/or 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



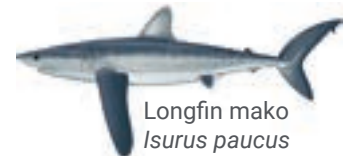
Oceanic whitetip shark
Carcharhinus longimanus



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



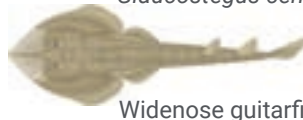
Halavi guitarfish
Glaucostegus halavi



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

In memoriam to Dharmadi, a dear friend, colleague, and mentor to many in the research and management of sharks and rays in Indonesia.

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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 as-

essed for consistency within species and variations across the Indian Ocean region using photographs supplied by colleagues, published in the literature, and online. A special thanks to the following for their assistance in providing invaluable guidance and constructive review of this guide: Benaya Simeon, Efin Muttaqin, Angga Yudhistira, Chelsea Stein, Wendy Fadri, Restya Rahmانيar, Djumadi Parluhutan Pandjaitan, Daniel Fernando, and the participants of the Train the Trainers workshop (January 2020) who submitted comments.

Photographs collected from the field were also provided by Benaya Simeon (*Carcharhinus albimarginatus*, *Cirrhigaleus barbifer*, *Galeocerdo cuvier*, *Heptranchias perlo*, *Squalus hemipinnis*), Hetty Priyanti Efendi (*Paragaleus tengi*), Faisal Abdul Aziz and Rifky for processed carcasses pictures from the field, and Zoya Tyabji (*Carcharias taurus*, *Carcharhinus altimus*, *Carcharhinus sorrah*, *Triaenodon obesus*).

GUIDANCE DOCUMENTS

- Dent F, Clarke S. 2015. State of the global market for shark products. FAO Fisheries and Aquaculture Technical Report No. 590. FAO, Rome: 187 pp.
- Jabado RW, Ebert DA. 2015. Sharks of the Arabian Seas: an identification guide. The International Fund for Animal Welfare, Dubai, UAE. 240 pp.
- Last PR, White WT, Caira JN, Dharmadi, Fahmi, Jensen K, Lim APK, Manjaji-Matsumoto BM, Naylor GJP, Pogonoski JJ, Stevens JD, Yearsley GK. 2010. Sharks and rays of Borneo. CSIRO PUBLISHING, Collingwood VIC 3066 Australia. 298 pp.
- Muttaqin E, Simeon B, Ichsan M, Dharmadi, Prasetyo AB, Booth H, Yulianto I, Friedman K. 2018. The scale, value and importance of non-fin shark and ray commodities in Indonesia. FAO, Ministry of Marine Affairs and Fisheries, and Wildlife Conservation Society. 48 pp.
- Sander S. 2016. A guide to the identification of the carcasses of the federally managed sharks of the US Atlantic and Gulf of Mexico. NOAA Fisheries Service, Highly Migratory Species Division. Silver Spring, MD. 18 pp.
- White WT, Last PR, Stevens JD, Yearsley GK, Fahmi, Dharmadi. 2006. Economically important sharks and rays of Indonesia. Australian Centre for International Agricultural Research: Canberra. 329 pp.
- White WT, Baje L, Sabub B, Appleyard SA, Pogonoski JJ, Mana RR. 2017. Sharks and rays of Papua New Guinea. ACIAR Monograph No. 189. Australian Centre for International Agricultural Research: Canberra. 327 pp.



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 processed carcasses from CITES-listed sharks and rays leads to establishing reasonable or probable cause in an enforcement setting (e.g., detaining cargo from a vessel suspected of harvesting these species in prohibited areas; shipments containing products from CITES-listed species crossing international borders without the required permits).

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 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 **Processed Carcass ID** guide uses a flow chart format, photographs, and descriptions of the key features that remain on processed carcasses for species commonly traded for their meat that can be used to quickly and easily distinguish carcasses 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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