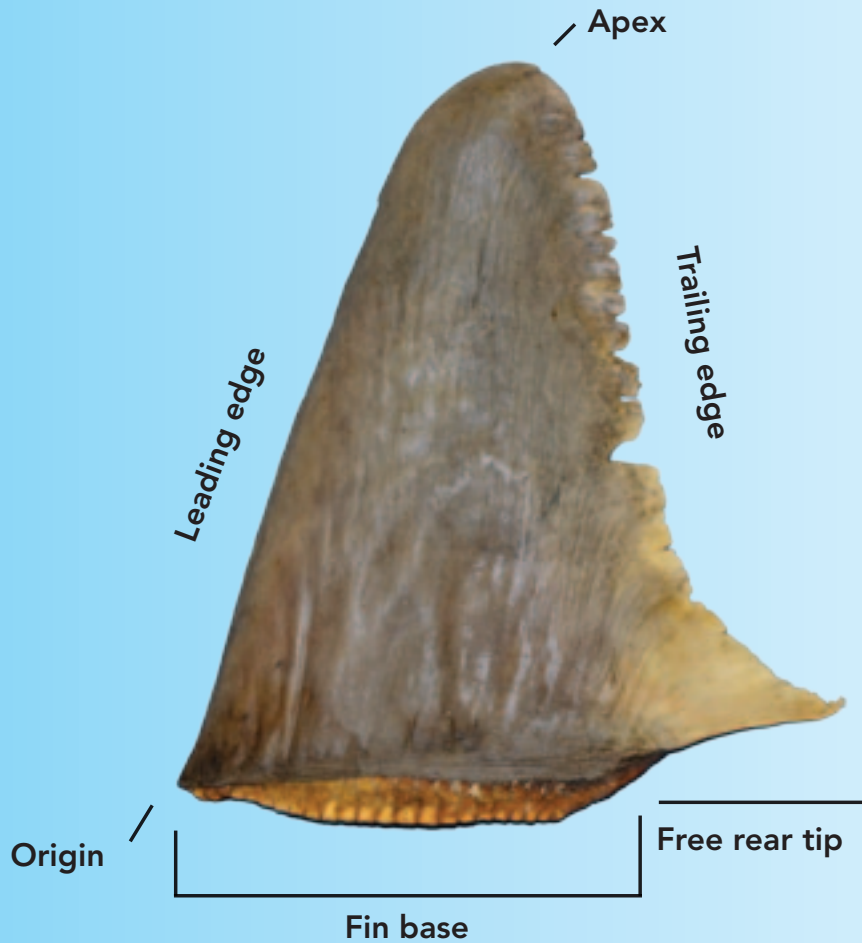


Identifying Shark Fins:

Oceanic Whitetip, Porbeagle and Hammerheads

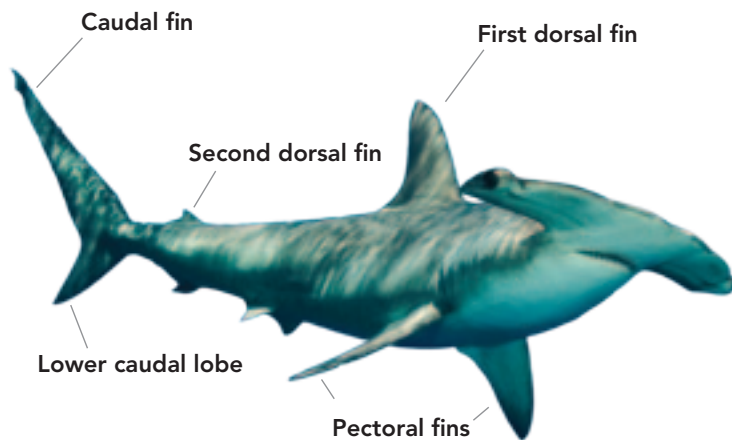


Dorsal fin landmarks used in this guide



Shark fins

The image shows the positions of the fin types that are highly prized in trade: the first dorsal, paired pectoral fins and the lower lobe of the caudal fin. The lower lobe is the only part of the caudal fin that is valuable in trade (the upper lobe is usually discarded). Second dorsal fins, paired pelvic fins and anal fins, though less valuable, also occur in trade.



The purpose of this guide

Many experts agree that it is necessary to monitor the trade in fins of five shark species of concern: oceanic whitetip, porbeagle and three species of hammerhead sharks (scalloped, smooth and great). These species are globally distributed, large-bodied and their fins are traded internationally in large numbers. Four of the species have at least one population listed as Endangered or Critically Endangered by the International Union for Conservation of Nature (IUCN). In addition, four of the species are subject to conservation and management measures in one or more regional fisheries management organizations. All of these species have also at some point been proposed for inclusion on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

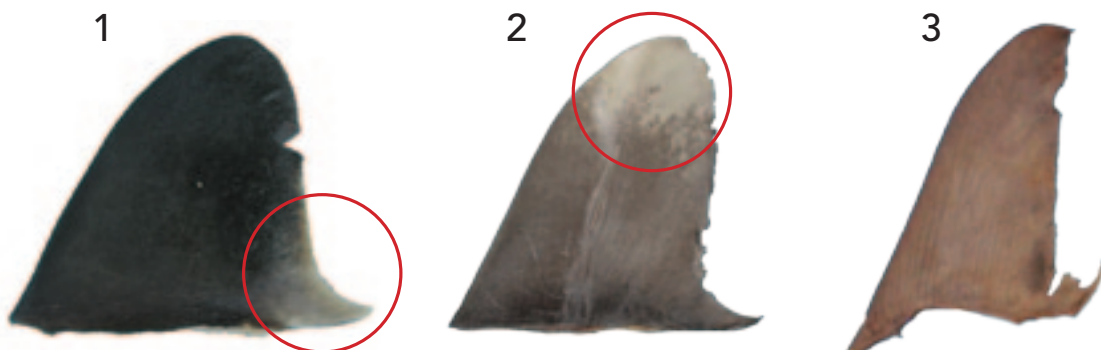
This guide is intended to help enforcement and customs personnel in the provisional identification of the first dorsal fins of these five shark species. In law enforcement situations, this could provide probable cause to hold questionable fins, so that expert opinion could be sought or genetic testing could be conducted to confirm the field identification. The guide focuses on dried, unprocessed first dorsal fins because these are the most easily identified of the traded fins for these species. More than 500 dorsal fins from over 40 shark species were examined in developing this guide. Although there are more than 450 species of sharks, most of them (65%) are small-bodied (less than 1 meter in length as adults) and their dorsal fins are too small to be confused with the dorsal fins from the large-bodied species covered in this guide.¹ We suggest caution when using this guide to identify fins less than 10 cm across the base. Only the fins of very young oceanic whitetip, porbeagle and the three hammerhead sharks would be that small. Additional details about the specimens examined are provided on Page 9 and at www.sharkfinid.org.

Fins from 14 large-bodied shark species make up roughly 40% of the global fin trade. The oceanic whitetip and three hammerheads in this guide are included in this group and were estimated to constitute 7-9% of traded fins in 2000. Shark fin traders in Asia visually sort fins from these species into specific trade categories using the shape and color of the fin.²

This guide describes the key characteristics that can be used to quickly and easily separate the first dorsal fins of these five species from other types of shark fins in trade (see "At a glance..." below). Porbeagle and oceanic whitetip first dorsal fins can be rapidly and unambiguously identified to the species level based on the diagnostic **white markings** detailed in this guide. The first dorsal fins of hammerhead sharks as a group can also be rapidly separated from all other large sharks using two simple measurements that describe their characteristic shape (**much taller than they are broad**) and color (**dull brown or light grey**). The three hammerhead species covered in this guide are the only hammerheads that are common in international trade. Species identification of hammerhead sharks requires examination of dorsal and pectoral fin sets (details provided on Page 8) or genetic testing.

At a glance...

The sharks of interest have distinct white dorsal fin markings (1 and 2) OR their dorsal fins are tall, slender from leading edge to trailing edge and light brown (3).



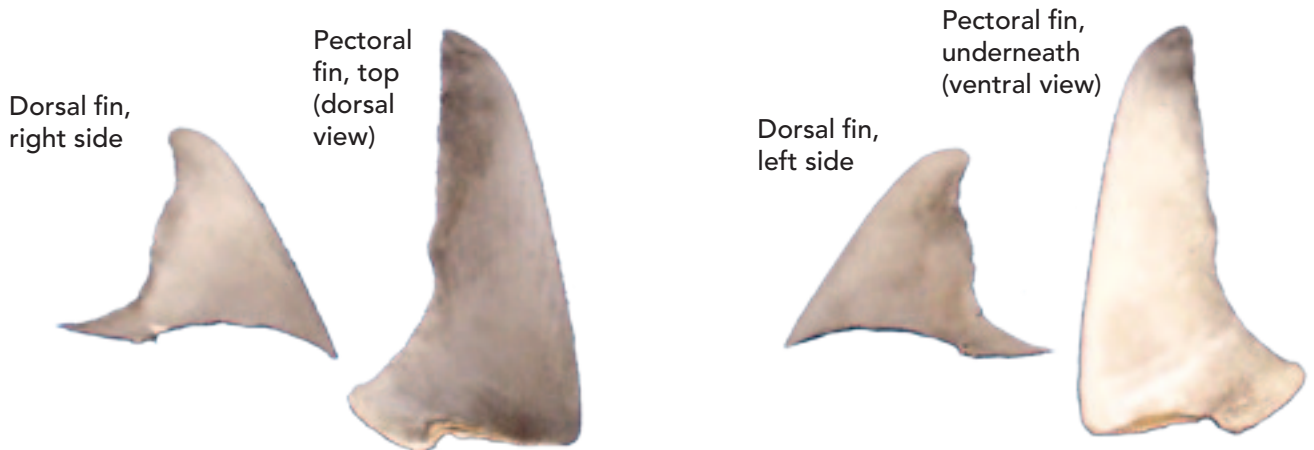
Three steps to using this guide

- Step 1. Distinguish 1st dorsal fins from other highly-valued traded fins: pectoral fins and lower caudal lobes (see below).
- Step 2. Look for white 1st dorsal fin markings, and use the flowchart on Page 3 to identify either porbeagle or oceanic whitetip sharks or exclude many species with black fin markings.
- Step 3. Take several simple measurements (Page 4) to help identify hammerhead 1st dorsal fins, which are much taller than they are broad and are dull brown or light grey.

Step 1: Distinguish 1st dorsal fins from pectoral fins and lower caudal lobes

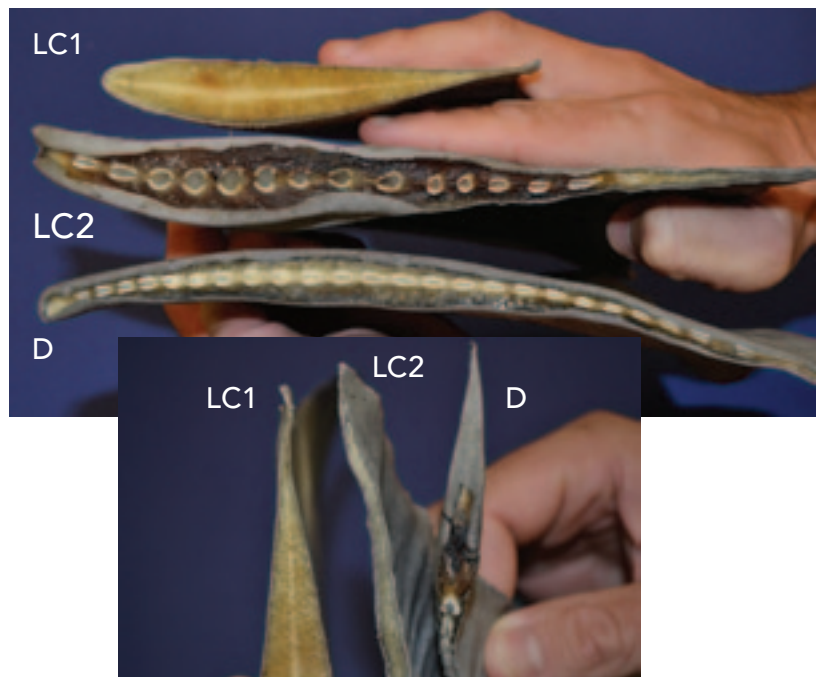
a. Check the fin color on each side

Dorsal fins are the same color on both sides (see right and left side views below). In contrast, pectoral fins are darker on the top side (dorsal view) and lighter underneath (ventral view); (see both views below).

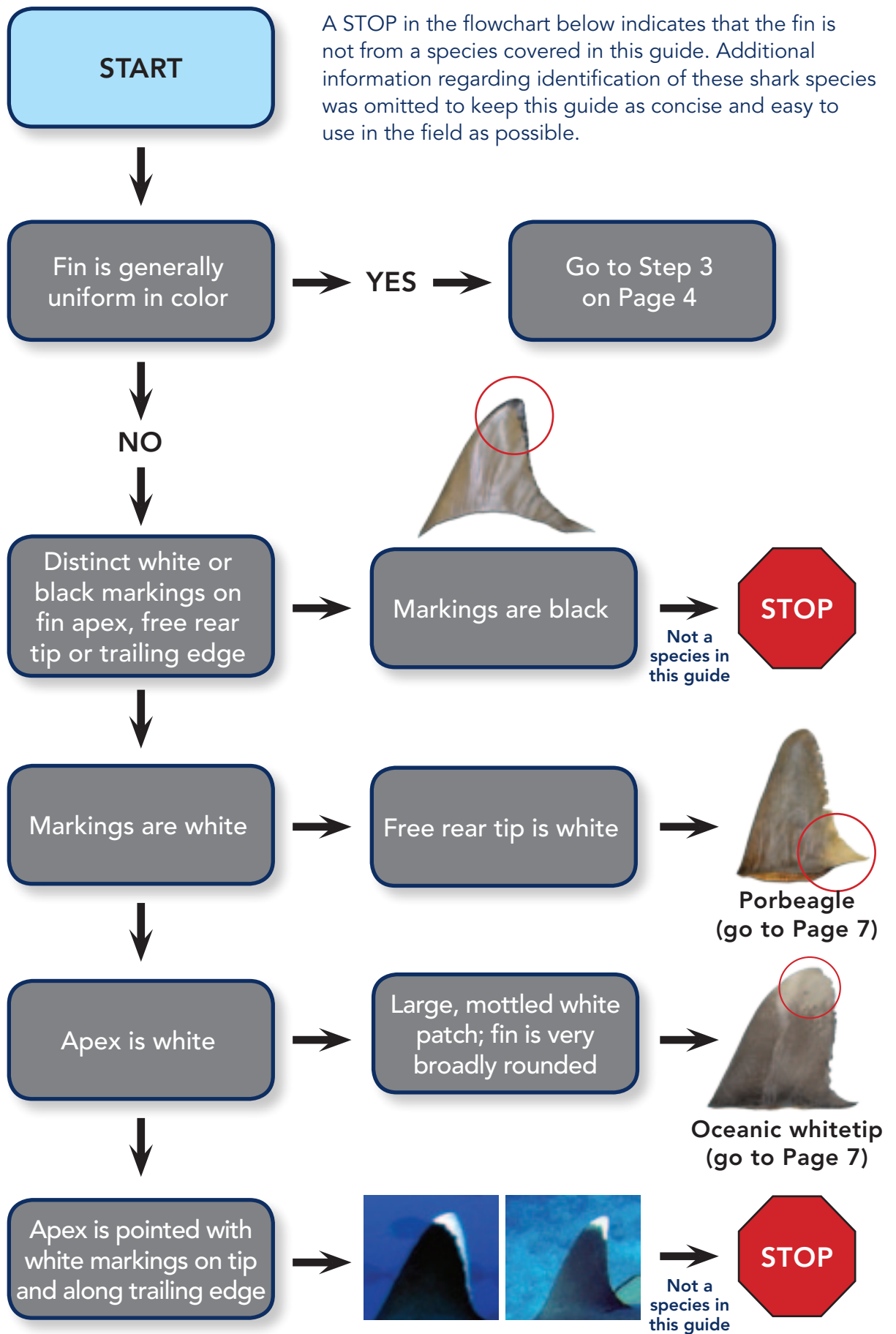


b. Check the base of the fin

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 valuable part of the lower caudal lobe. In some lower caudal lobes (LC2) there may be a small number of the cartilaginous blocks, but they are usually widely spaced and/or occur only along part of the fin base. Usually the lower caudal lobe has been cut along its entire base when removed from the shark; in contrast, dorsal fins frequently have a free rear tip that is fully intact.



Step 2: Identify porbeagle and oceanic whitetip 1st dorsal fins

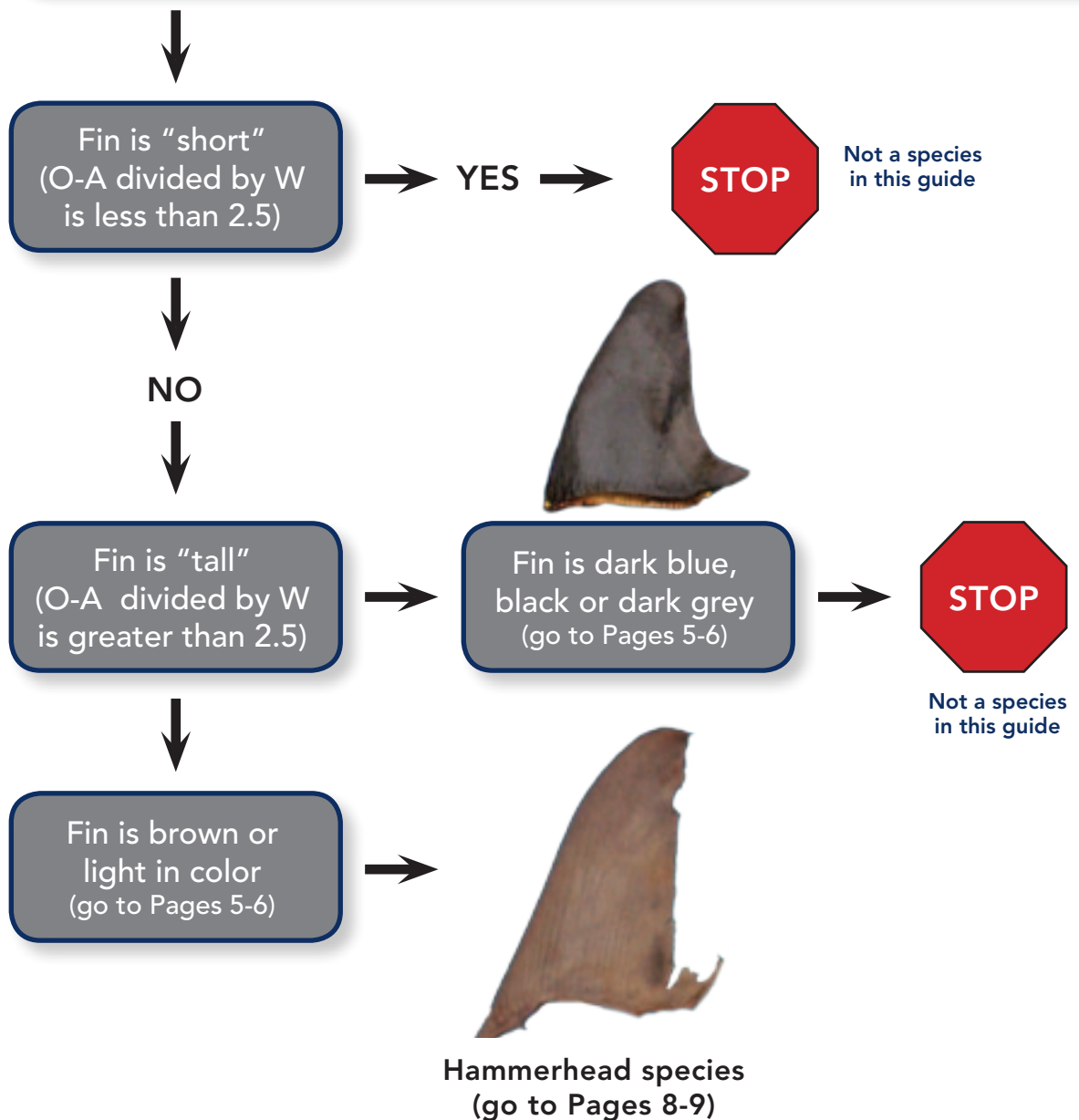
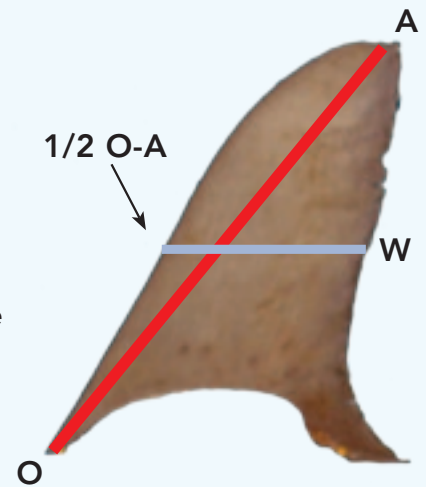


Step 3: Identify hammerhead 1st dorsal fins

Take fin measurements

- 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).

Origin, apex and fin width (measured from leading edge to trailing edge) are landmarks found to be the most useful for species identification purposes, as measurements based on fin height, fin base and free rear tip were often too variable and dependent on cut and condition of the fin.



Distinguishing hammerhead dorsals from other tall fins (mako and thresher sharks)

First dorsal fins from mako, thresher and hammerhead sharks are tall and slender from leading to trailing edge. In the image below, thresher and mako fins (top row) are slate to dark grey in color. Great hammerhead first dorsal fins (bottom row, left) have a distinctive curved shape and are a much lighter grey than mako or thresher fins. Scalloped and smooth hammerhead first dorsal fins (bottom row, right) are similar in shape to the dorsal fins of mako and thresher sharks, but they are much lighter in color and are usually light brown instead of grey.

Shortfin mako
(*Isurus oxyrinchus*)



Thresher
(*Alopias vulpinus*)



Great hammerhead
(*Sphyrna mokarran*)



Scalloped hammerhead
(*Sphyrna lewini*)

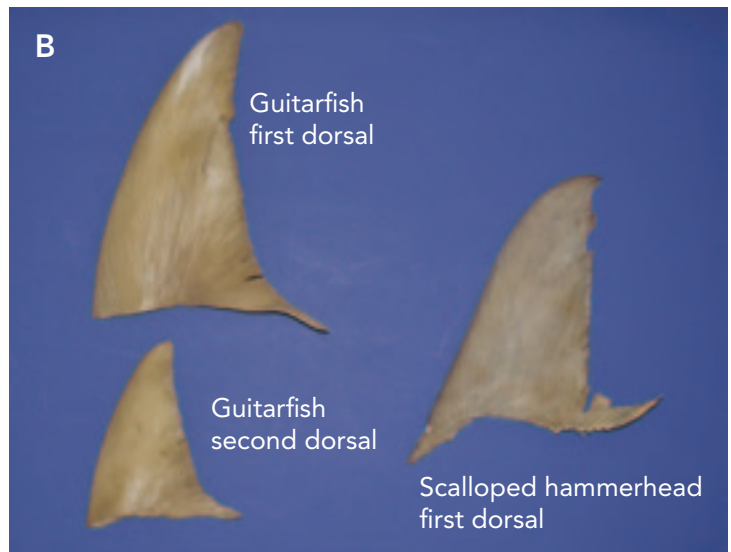


Distinguishing hammerhead dorsals from other tall fins (guitarfish and blacktip sharks)

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 8 and 9.



Tall dorsal fins can also come from several species of **guitarfish** or **blacktip sharks**. In guitarfish first dorsal fins, cartilaginous blocks do not extend across the entire fin base (Image A). In hammerheads, these cartilaginous blocks are present along almost the entire fin base (Image A). Guitarfish dorsal fins also exhibit a glossy sheen (Image B), and some species also have white spots, unlike the dull brown, uniform coloration of hammerhead dorsal fins.



Some blacktip shark (*Carcharhinus limbatus*) first dorsal fins exhibit 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 that is unlike the dull of the hammerheads (Image C).



Blacktip shark pectoral fins are also longer and more slender than the short, broad fins of the hammerheads (Image D).



Porbeagle *Lamna nasus*

IUCN Red List
Designation

VULNERABLE



1st dorsal fin: dark blue/black to dark greyish brown, rounded apex with white patch on lower trailing edge onto free rear tip



Courtesy of NOAA Fisheries Service

Pectoral fins: short, rounded at apex; ventral surface has dusky coloration from apex throughout midsection of fin and along leading edge



Dorsal view
(top)



Ventral view
(underneath)



©IUCN

IUCN Red List Designations: NE Atlantic and the Mediterranean subpopulations are Critically Endangered, and the NW Atlantic subpopulation is designated as Endangered

Oceanic Whitetip *Carcharhinus longimanus*

IUCN Red List
Designation

VULNERABLE



1st dorsal fin: large and broadly rounded (paddle-like); mottled white color at apex



Courtesy of NOAA Fisheries Service

Pectoral fins: long, broadly rounded at apex; dorsal surface has mottled white color at apex; ventral surface is typically white but can have mottled brown coloration

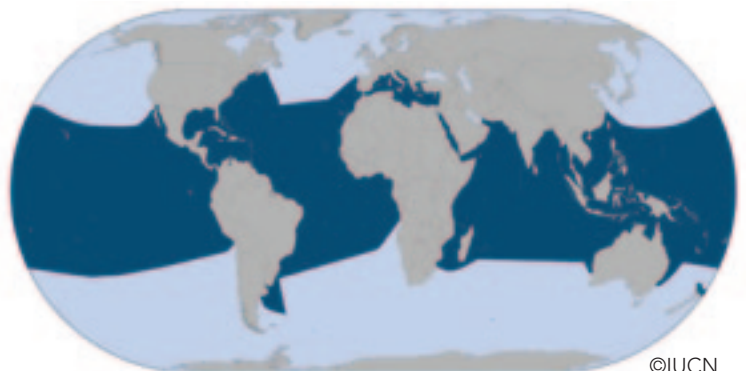
- mottled white color also present on caudal fin (upper and lower lobe)
- very small juveniles may have mottled black coloration on dorsal, pectoral and caudal fins



Dorsal view
(top)



Ventral view
(underneath)



©IUCN

IUCN Red List Designations: NW Atlantic and Central Atlantic subpopulations are designated as Critically Endangered

Scalloped Hammerhead *Sphyrna lewini*

IUCN Red List
Designation

ENDANGERED



1st dorsal fin: tall, flattening out toward apex; straight to moderately curved trailing edge (similar to smooth hammerhead, less slender than great hammerhead 1st dorsal fin)



Courtesy of NOAA Fisheries Service

Pectoral fins: short and broad with black tips visible at the apex on ventral side



Dorsal view
(top)



Ventral view
(underneath)



©IUCN

Smooth Hammerhead *Sphyrna zygaena*

IUCN Red List
Designation

VULNERABLE



1st dorsal fin: tall, sloping more at apex; moderately curved trailing edge (similar to scalloped hammerhead, less slender than great hammerhead 1st dorsal fin)

Note: Scalloped and smooth hammerhead 1st dorsal fins are so similar they are often extremely hard to differentiate. However, it is not uncommon for valuable fins from an individual to be traded as a set (first dorsal, paired pectoral fins and lower caudal lobe). If this is the case, the two species can be distinguished using the pectoral fins.



Courtesy of NOAA Fisheries Service

Pectoral fins: short and broad with faint to no markings on ventral side



Dorsal view
(top)



Ventral view
(underneath)



©IUCN

Great Hammerhead *Sphyrna mokarran*

IUCN Red List
Designation

ENDANGERED



1st dorsal fin: tall, slender from leading edge to trailing edge; elongated and pointed at apex

Note: Small to moderate-sized great hammerhead first dorsal fins may be difficult to distinguish from those of the winghead shark (*Eusphyrna blochii*). However,

wingheads are only found in India, Thailand, Indonesia and Northern Australia and are extremely rare in trade. On a global basis, 1st dorsal fins with this shape are much more likely to be from great hammerheads than wingheads.

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)



Courtesy of NOAA Fisheries Service



©IUCN

About the guide

This guide is based on data collected during the examination of more than 500 dorsal fins and 900 pectoral fins from over 40 shark species, including all of the dominant species or species groups in the international fin trade reported in Clarke et al. (2006).³ Conspicuous fin markings were also assessed for pattern and consistency within species using photographs published in the literature and on the internet. Fin sets originated from the United States, Belize, Chile, South Africa, Fiji and New Zealand and included a wide size range for each species. Fins and fin sets examined in this study were provided by fishermen, fin traders and scientists: no sharks were sacrificed for this project. Photos of whole shark specimens are courtesy of the NOAA's Pelagic Observer Program (POP). Porbeagle fin photos on Page 7 were provided by Sebastian Hernandez. Dorsal fins on Page 3 were provided by Angelo Villagomez (whitetip reef) and Guy Stevens (silvertip). Cover photos were provided by David Fleetham/Oceanwidelmages.com (oceanic whitetip), Doug Perrine/SeaPics.com (porbeagle) and Chris & Monique Fallows/Oceanwidelmages.com (scalloped hammerhead cover and inside cover). All other fin photos were provided by Debra Abercrombie. We would like to thank the Kwa-Zulu Natal Sharks Board, the New Zealand Department of Conservation, the Fiji Department of Fisheries, the U.S. National Marine Fisheries Service, the Florida Fish and Wildlife Conservation Commission, and the Belize Department of Fisheries for assistance.

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1. Musick, J.A., et al. "Historical Zoogeography of the Selachii," in *Biology of Sharks and Their Relatives*, ed. Jack A. Musick et al., CRC Press, 33-78 (2004).
2. Clarke, S.C., et al., "Identification of shark species composition and proportion in the Hong Kong shark fin market based on molecular genetics and trade records," *Conservation Biology*, 20:201-211 (2006).
3. Ibid.

For more information:



Jill Hepp
Manager, Global Shark Conservation
Pew Environment Group
901 E St. NW
Washington, DC 20004, USA
Tel: +1-202-552-2000
Email: info@pewtrusts.org
www.pewenvironment.org/sharks



Demian D.F. Chapman, Ph.D.
Assistant Professor
School of Marine and Atmospheric Sciences
Stony Brook University
Stony Brook, NY 11794, USA
Tel: +1-631-632-8731
Email: Demian.Chapman@stonybrook.edu
www.sharkfinid.org