NOAA Technical Memorandum NMFS-SEFSC-643

VISUAL IDENTIFICATION OF FINS FROM COMMON ELASMOBRANCHS IN THE NORTHWEST ATLANTIC OCEAN

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NATIONAL MARINE FISHERIES SERVICE
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Contents

Introduction

Shark fins are a highly prized commodity in many Asian cultures (Fong and Anderson, 2000; Clarke et al., 2007). Sharks sourced for fins come from directed fisheries, from bycatch in multi-species fisheries, and illegal, unreported and unregulated (IUU) fisheries (Lack and Sant, 2008). Despite the fact that expanding global demand for shark products (especially fins) has resulted in substantially increased exploitation of sharks worldwide, utilization and trade in shark parts remains poorly assessed in terms of its species composition and magnitude. The limited data available are often difficult to interpret and are often not accurate enough to indicate which species and regions are most affected by the trade (Rose, 1996; Clarke, 2002; Clarke, 2004). In response to the international trade in fins and other products, the status of several elasmobranch species, the white (*Carcharodon carcharias*), basking (*Cetorhinus maximus*) and whale shark (*Rhincodon typus*) have been listed in Appendix II and 4 species of sawfish (Family Pristidae) in Appendix I of the Convention on International Trade in Endangered Species (CITES). The porbeagle (*Lamna nasus*), oceanic whitetip (*Carcharhinus longimanus*), scalloped hammerhead (*Sphyrna lewini*), smooth hammerhead (*Sphyrna zygaena*) and great hammerhead (*Sphyrna mokarran*) shark have also been proposed for listing in Appendix II of CITES due to the large volume and high value of their fins in the international trade market (http://www.cites.org/eng/cop/15/prop/index.shtml).

Because shark species differ in their life history characteristics, and thus susceptibility to exploitation (Smith et al., 1998; Cortés, 2002; NMFS, 2006), optimal conservation and sustainable management strategies are needed on a species-specific basis (NMFS, 2006). United States (U.S.) Atlantic coastal sharks are harvested in several

mixed-species fisheries, in which fins are one of the major products (NMFS, 2006; Clarke et al., 2006). Collection of data to the species level remains a major challenge due to the perceived difficulty of accurately identifying most sharks to species (NMFS, 2006). Identification of the species of origin of the detached fins is also particularly problematic (FAO, 2000; Smith and Benson, 2001; Shivji et al., 2002; Abercrombie et al, 2005). Although genetic analysis has been successfully used to accurately identify many harvested marine species, including sharks, it can be relatively expensive and time consuming to employ these techniques, especially for countries where resources available are limited. Development of morphological identification keys would be extremely useful for field inspection of fin landings and consignments to assess whether or not genetic testing is warranted (e.g., when fins from prohibited species are thought to be present). However, while many identification guides are available to identify whole sharks, guides specific to identifying shark fins to species are limited (Nakano and Kitamura, 1998; Nakano, 1999; Marshall, 2011).

To assist in identification of fins, we have designed an easy-to-use field guide based on morphological characteristics of the fin (i.e. fin color, distinct markings, fin shape) to be used by wildlife inspectors, customs personnel, researchers and fishers to provisionally identify detached, dried, unprocessed dorsal and pectoral fins from Large Coastal Sharks (LCS) and Pelagic Sharks that are common in the U.S. Atlantic Ocean, including the Gulf of Mexico. The format of the guide is designed for rapid and, for many species, unambiguous identification using key characteristics of the fin, such as shape, color and texture. A photograph of a dorsal fin for 19 species and paired pectoral fins for 20 species has been included in this guide, along with a general distribution, a brief fin

description and a list of similar species (if applicable) that may be confused for fins of the species in question. Small Coastal Sharks (SCS), the blacknose (*Carcharhinus acronotus*), finetooth (*Carcharhinus isodon*), bonnethead (*Sphyrna tiburo*), and Atlantic sharpnose (*Rhizoprionodon terraenovae*), are not included in this guide because detailed fin identification information is already available for these species (http://www.sharkid.com/sharkguides.html). The Caribbean reef shark (*Carcharhinus perezi*), bignose (*Carcharhinus altimus*), bigeye thresher (*Alopias superciliosus*) and longfin mako (*Isurus paucus*) are prohibited species in both commercial and recreational fisheries in the U.S. Atlantic and Gulf of Mexico but do not appear in this guide because we were unable to obtain a sufficient number of voucher specimens. However, comments included regarding these species and the fins of similar species when appropriate. This guide is intended to enable provisional field identification of fins, establishing probable cause to hold fins for expert examination or DNA-testing. We suggest using the guide to identify dorsal fins larger than 20 cm across the base (see "Dorsal Fin Landmarks") to avoid possible misidentification of samples from very small specimens and SCS species.

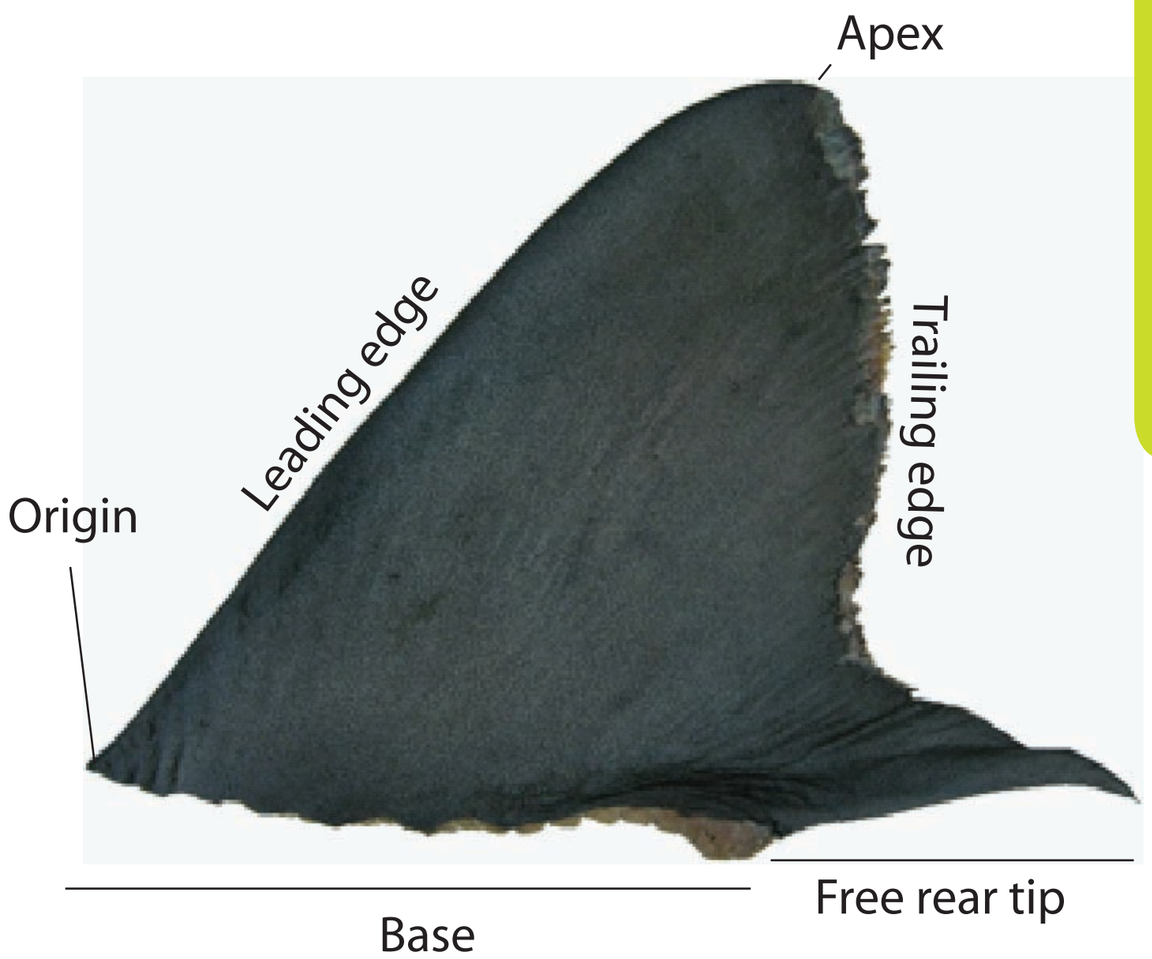
Methods

Reference fin sets (which includes the first dorsal fin, left and right pectoral fins) were collected from over 40 species caught during U.S. commercial fisheries operations or from established U.S. Atlantic fishery-independent surveys from June 2010 to August 2012. Shark fin voucher samples were collected and identified to species of origin from whole (dead) animals by trained NOAA personnel from the U.S. Commercial Shark Fishery Observer Programs (NMFS-Panama City, Florida), the Apex Predator Program

(NMFS-Narragansett, RI) and the NOAA Coastal Shark Survey (NMFS-Pascagoula, MS). Several other experienced shark researchers from various institutions (Florida Fish & Wildlife Conservation Commission laboratories; Florida State University) also provided fin sets as requested. Specimens listed under the U.S. Endangered Species Act (i.e. *Pristis pectinata*) were obtained following guidelines set in ESA permit #13330 issued to the Southeast Fisheries Science Center. Specimens listed as a Prohibited shark species under the Consolidated Atlantic Highly Migratory Species Fishery Management Plan (NMFS, 2006) were obtained under guidelines set in Exempted Fishing Permit SHK-EFP-10-04. Descriptions of shark fins presented in this guide are based on physical examination of voucher shark fin samples collected for this guide, as well as assessing photographs of whole specimens in published reference documents and on the internet.

Using the Guide

Dorsal Fin Landmarks



Step 1: Confirm that you have a dorsal fin or a pectoral fin.

Dorsal fins will be the same color on both sides. A lower caudal lobe will also be the same color on both sides, but the fin base will have no ("A", below) or a small number ("B", below) of visible pieces of cartilage. Dorsal fins will have a continuous row of cartilage along the entire fin base (see "C", below).

Pectoral fins will be darker on one side (counter-shaded).

Step 2: Go to **page 6** (for dorsal fins), **page 28** (for pectoral fins).

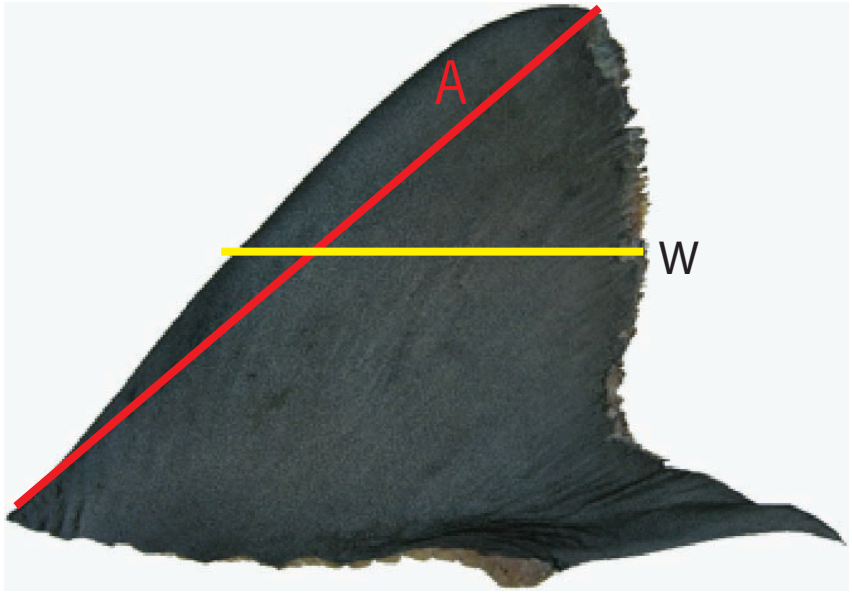
(Box 1): Are there conspicuous white or black markings on the dorsal fin apex or free rear tip?

Yes, the fin has a white-tipped apex..... **Oceanic whitetip (page 11)**
Yes, the fin has a white patch on the free rear tip..... **Porbeagle (page 12)**
Yes, the fin has a black-tipped apex..... **Blacktip** or **Spinner (page 13)**

No.....Go to **Box 2 (below)**.

(Box 2): Measure the aspect ratio of the fin, as shown below:

1. Measure the fin from the origin to the apex (=A).
2. Measure the fin's width (W) at the halfway point of A (i.e., if A is 20 cm, measure the width at 10 cm along A).
3. Divide A by W.

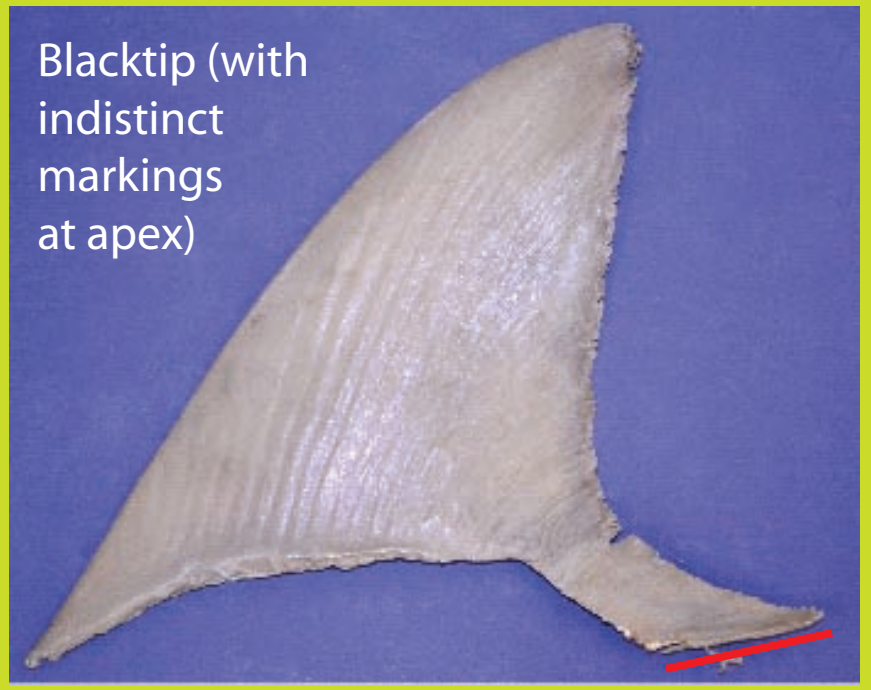


Fin is tall, A/W is larger than 2.6, go to **Box 3**, **page 8**. If A/W is 2.4 - 2.6, read **page 7**.

Fin is short and round, A/W is less than 1..... **Sand tiger (page 14)**

If the fin does not fit into any of these categories.....go to **Box 4 (page 8)**

The cutting and drying process causes variation in dorsal fin shape. Although the A/W value was the most consistent measurement we found to isolate species with especially tall dorsal fins (ie. threshers, hammerheads, blacktips), when A/W is between 2.4 and 2.6 the user should be cautious. If faced with this situation, the user should review the detailed descriptions for the dorsal fins of the **thresher (page 11)**, the three **hammerheads (page 12 and 13)**, **white (page 22)**, **shortfin mako (page 17)** and **blacktip (page 9)**.



Mako and thresher dorsal fins have a much thicker bases than the hammerheads. Hammerheads also have light colored, dull brown or greyish-brown fins, whereas the thresher and mako dorsal fins are slate grey or dark greyish-brown. Blacktip dorsal fins are also light brown or greyish-brown and differ from hammerhead dorsal fins in that they are very smooth and often appear to be shiny. Hammerhead fins can have a slight shine to them, but are comparatively dull. The free rear tip of a blacktip first dorsal fin is also relatively long (around 1/3 of the height of the fin) compared to the thresher, mako, white and hammerhead first dorsal fins.

(Box 3):
Which of the following best describes the fin:

Dark, slate grey or greyish-brown. The leading edge has A very steep angle. Fin is erect.
Thresher (page 15)

Grey or light greyish-brown, very tall, curved leading edge with a pointed apex, concave trailing edge.
Great hammerhead (page 16)

Dull brown or light grey, rounded apex.
Scalloped or smooth hammerhead (page 17)

(Box 4): Is the trailing edge of the fin convex (curves outwards)?

Yes, fin is dark grey or greyish-brown
Blue shark (page 18)
Yes, fin is light grey or greyish-brown
Silky (page 19) or **Night shark (page 20)**
No, trailing edge is straight or concave.....**Box 5**

(Box 5): Is the fin dark greyish-brown or slate grey, with a steep-angled leading edge, a smooth texture and a short free rear tip?

Yes.....**Shortfin mako (page 21)**
No.....**Box 6 (below)**

(Box 6): The dorsal fins of the remaining species are quite similar. The user should read each of the descriptions presented here and then decide which best describes the fin they are trying to identify.

Fin is broad, has a rough texture, a long free rear tip that is almost 1/2 of the fin height. The fin may also have faint horizontal dark blotches. It will also feel light for its size.....**Tiger shark (page 22)**

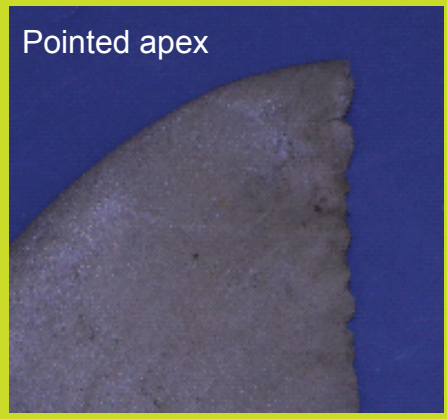
If the fin does not fit this description move on to **Box 7**

(Box 7): The fin is covered in large denticles, some of which look like salt grains, and has a rough texture.

If the apex is rounded.....
Sandbar (page 23)

If the apex is pointed.....
Bull (page 24)
Lemon (page 25)

If fin is smooth with small denticles, go to **Box 8 (below)**.



(Box 8): Fin has a short free rear tip, leading edge flattens out as it approaches the apex. Trailing edge is often ragged.

Yes.....**White (page 26)**

No, fin has long free rear tip (roughly 1/3 of fin height).....**Dusky (page 27)**

Oceanic whitetip shark (*Carcharhinus longimanus*)

Distribution: Globally distributed in tropical and subtropical regions.
Habitat: Offshore, occassionally close to shore along islands. Mostly taken in pelagic fisheries.

First dorsal fin description

- Broad fin with rounded apex.

- Fin apex has a white patch that is often mottled. Remaining fin is light brown or bronze in color.

- Short free rear tip.

- Smooth texture.

Similar species: None.

Porbeagle shark (*Lamna nasus*)

Distribution: Widely distributed in temperate and subpolar regions (absent in the North Pacific).
Habitat: Offshore. Mostly taken in pelagic fisheries.

First dorsal fin description

- Free rear tip has a distinct white patch. Remaining fin is dark grey to greyish-brown.

- Tall, erect with broadly rounded apex.

-Short free rear tip.

-Smooth texture.

Similar species: Mako and thresher sharks have similar color and shaped first dorsal fins, but lack the diagnostic white patch on the free rear tip.

Blacktip shark (*Carcharhinus limbatus*)

Distribution:
Worldwide, warm temperate to tropical regions.

Habitat: Inshore. Mostly taken in coastal and estuarine fisheries.

First dorsal fin description
- Tall, narrowing at apex.
- Black markings at apex that can be distinct, faded or absent entirely.
- Remaining fin color is brown to greyish-brown.
- Glossy, smooth texture.
- Moderately long free rear tip.

Similar Species: Scalloped and Smooth hammerhead first dorsal fins are tall and slender, but are dull brown or greyish-brown in color with a shorter free-rear tip. Thresher and large mako first dorsal fins are also tall, but are more erect and dark grey or greyish-brown color.

Spinner shark (*Carcharhinus brevipinna*)

Distribution:
Worldwide, warm temperate to tropical regions.

Habitat: Inshore. Mostly taken in coastal and estuarine fisheries.

First dorsal fin description
- Relatively short, moderately broad, rounded apex
- Apex with distinct black markings visible.
- Remaining fin color is brown to greyish-brown.
- Glossy, smooth texture.
- Short free rear tip.

Similar Species: Blacktip first dorsal fins are similar in color (glossy sheen and often, but not always, visible black marking at apex) but are taller and more slender.

Sand tiger shark (*Carcharias taurus*)

Distribution: Widely distributed in warm temperate regions (absent in North Pacific).
Habitat: Coastal and estuarine. Mostly taken in coastal fisheries.

First dorsal fin description

- Fin is light brown to golden brown in color.
- Fin is short and broad, rounded at apex and along trailing edge.
- Short, rounded free rear tip.
- Rough, sandpaper-like texture.

*The 1st and 2nd dorsal fins are similar in size and shape. Both are probably retained for trade.

Similar species: Nurse shark first dorsal fins (no sample available, so not included in this guide) are similar in shape and color, but their denticles are large, smooth and pebble-like in appearance.

Common thresher shark (*Alopias vulpinus*)

Distribution: Worldwide in temperate regions.

Habitat: Typically offshore but does come inshore. Mostly taken in pelagic fisheries.

First dorsal fin description

- Tall, erect and narrow but thick across the base.
- Fin color is dark, slate grey or greyish-brown. Some specimens have a very small white patch visible at the fin apex.
- Short free rear tip.
- basal cartilage is elongated laterally (see photo below)

**Pelvic fins (not included in this guide) are large and likely retained for trade.*

Similar species: Large makos have relatively tall first dorsal fins with an A/W of around 2.5 and a similar coloration to threshers. Hammerhead first dorsal fins (pg 12, and 13) are also tall, but are light grey or light greyish-brown in color and not as thick laterally across the base.

Great hammerhead shark (*Sphyrna mokarran*)

Distribution: Worldwide, warm temperate to tropical regions.
Habitat: Inshore. Mostly taken in coastal and estuarine fisheries.

First dorsal fin description

- Very tall and narrow with pointed apex.
- Trailing edge is concave (curves inward).
- Fin color is grey to light greyish-brown.
- Short free rear tip.

*Pelvic fins (not included in this guide) are large and likely also retained for trade.

Similar species: The great hammerhead has a distinctive, very tall, crescent-shaped first dorsal fin. It is taller and more slender than the other large hammerheads and has a very pointed apex. It is a much lighter grey or greyish-brown color than the dark, slate grey or dark greyish-brown of the common thresher shark and has a strong curved shape compared to the erect thresher first dorsal fin.

Scalloped hammerhead shark (*Sphyrna lewini*), Smooth hammerhead shark (*Sphyrna zygaena*)

Distribution: Both species are found worldwide. Scalloped hammerheads tend to be more common at lower latitudes than smooth hammerheads.
Habitat: Typically inshore. Taken in coastal and pelagic fisheries.

Similar species: Blacktip first dorsal fins are glossy and appear to shine much more than dull brown or grey hammerhead fins. First dorsal fins of thresher and large mako sharks are also tall, but are darker grey in color and much thicker across the base.

The first dorsal fins of these two species are almost indistinguishable. For this reason, the description is the same.
Note: If dorsal fins and pectoral fins are kept together and traded as a set, the species can be easily identified. The ventral surface of the scalloped hammerhead pectoral fins have black tips at the apex. Smooth hammerheads do not (See pages 27-33).

First dorsal fin description

- Tall and narrow from leading edge to trailing edge with a rounded apex.
- Fin color is dull brown to light grey. Fin is typically dull and not very glossy.
- Smooth texture.
- Short free rear tip.

Blue shark (*Prionace glauca*)

Distribution: Worldwide in temperate to tropical regions.
Habitat: Offshore. Mostly taken in pelagic fisheries.

First dorsal fin description

- Rounded apex with convex trailing edge.

- Fin color is dark grey to dark greyish-brown.

- Moderate free rear tip.

-Leading edge has a very shallow angle.

Similar species: The first dorsal fins of silky and night sharks are similar in shape, but are a lighter brown or greyish-brown in color. Bignose shark first dorsal fins (not included in this guide due to lack of sufficient samples for comparison) are similar in size and shape, but like the silky and night sharks, are also light grey or greyish-brown color.

Silky shark (*Carcharhinus falciformis*)

Distribution: Widely distributed in warm temperate to tropical regions.
Habitat: Primarily offshore. Mostly taken in pelagic fisheries.

First dorsal fin description

- Fin is light grey to greyish-brown color.
- Fin is rounded at apex and has convex trailing edge.
- Smooth texture with small denticles.
- Long free rear tip.

Similar species: Night shark first dorsal fins are similar in shape and color, but lack such a long free rear tip. Bignose shark first dorsal fins (not included in this guide due to lack of sufficient samples for comparison) are also similar in shape and color. Blue shark first dorsal fins are similar in shape, but are more dark grey or greyish-brown in color.

Night shark (*Carcharhinus signatus*)

Distribution: Widely distributed in warm temperate to tropical regions.
Habitat: Primarily offshore. Mostly taken in pelagic fisheries.

First dorsal fin description

- Fin is light grey to greyish-brown in color.

- Fin is narrowly rounded at apex and has convex trailing edge.

- Smooth texture with small denticles.

- Moderately long free rear tip.

Similar species: Silky shark first dorsal fins are similar in color and shape, but they have a more rounded apex. Blue shark first dorsal fins are similar in shape, but are dark grey or greyish-brown in color. Bignose shark first dorsal fins (not included in this guide due to lack of sufficient samples for further comparison) are extremely similar in shape and color.

Shortfin mako shark (*Isurus oxyrinchus*)

Distribution: Worldwide in temperate to tropical regions.
Habitat: Offshore. Mostly taken in pelagic fisheries.

First dorsal fin description

- Very erect fin with a rounded apex, leading edge has a steep angle, moderately straight trailing edge.

- Dark, slate grey or greyish-brown in color.

- Smooth texture.

- Short free rear tip.

Similar species: Common thresher first dorsal fins are similar in color and shape, but tend to be taller, more erect, with compressed cartilage at the base (may also have a very small white patch at the apex). Bigeye thresher and longfin mako first dorsal fins (not included in this guide due to lack of sufficient samples for comparison) are suspected to be similar in shape and color.

Tiger shark (*Galeocerdo cuvier*)

Distribution: Widely distributed in warm temperate to tropical regions.
Habitat: Inshore and offshore. Mostly taken in coastal fisheries, occasionally in pelagic fisheries.

First dorsal fin description

- Light to dark grey or greyish-brown in color, sometimes with a faint dark grey mottled horizontal pattern (especially on smaller specimens).
- Short and broad with a rounded apex.
- Fin is lightweight, with a rough, sandpaper-like texture.
- Long free rear tip (about 1/3 of fin height).

Similar species: Bull shark and lemon shark first dorsal fins are similar in shape but have a more pointed apex, larger denticles, shorter free rear tip and have no visible dark mottled horizontal markings. Lemon shark first dorsal fins are also light brown to golden brown in color.

Sandbar shark (*Carcharhinus plumbeus*)

Distribution: Widely distributed in warm temperate to tropical regions.

Habitat: Inshore and offshore. Mostly taken in coastal fisheries, occassionally in pelagic fisheries.

First dorsal fin description

- Fin is light brown, tan or light grey to greyish-brown in color.
- Fin is rounded at apex.
- Moderately short free rear tip.
- Rough texture with large, visually obvious denticles, some of which look like salt grains. Denticles are also very concentrated on leading edge.

Similar species: Bull shark first dorsal fins are similar in shape and color but are more pointed at the apex; dusky shark first dorsal fins are similar in shape and color, but lack the large salt-grain like denticles. White shark first dorsals are similar in shape but have smaller denticles and a shorter free rear tip.

Bull shark (*Carcharhinus leucas*)

Distribution: Widely distributed in warm temperate to tropical regions.
Habitat: Inshore and estuarine. Mostly taken in coastal, estuarine and freshwater fisheries.

First dorsal fin description

- Fin is light grey to greyish-brown in color.

- Fin is short, broad and triangular in shape with a pointed apex.

- Short free rear tip.

- Large, obvious denticles, some of which look like salt grains.

- Rough texture to the touch, like sandpaper

Similar species: Lemon shark first dorsal fins are similar shape, but are light brown to golden brown in color. Sandbar shark first dorsal fins have similar-sized, salt-grain like denticles, but the fin apex is rounded. Tiger dorsal fins are similar in shape and color, but have a more rounded apex and longer free rear tip.

Lemon shark (*Negaprion brevirostris*)

Distribution: Worldwide, warm temperate to tropical regions.
Habitat: Inshore. Mostly taken in coastal and estuarine fisheries.

First dorsal fin description

- Fin is light brown to golden brown in color.
- Fin is short, very broad and triangular in shape with a pointed apex.
- Large, obvious denticles, some of which look like salt grains.
- Moderate free rear tip.

**The 1st and 2nd dorsal fins are similar in size and shape. Both are probably retained for trade.*

Similar species: Bull shark first dorsal fins are similar in shape, with similar salt-grain like denticles, but the free rear tip is shorter and light grey to greyish-brown in color. Tiger shark first dorsal fins are similar in shape but the apex is not as pointed and the free rear tip is longer.

White shark (*Carcharodon carcharias*)

Distribution: Widely distributed. Most common in temperate regions but also found in tropics.
Habitat: Inshore and offshore. Mostly taken in coastal fisheries, possibly in pelagic fisheries.

First dorsal fin description

- Fin is dark grey to greyish-brown in color.
- Leading edge flattens out at apex.
- Trailing edge typically ragged in appearance.
- Short free rear tip.
- Rough, sandpaper-like texture.

Similar species: Shortfin mako shark first dorsal fins (and possibly longfin makos) are similar in shape, but are typically more erect (not flattening out at apex) and dark, slate grey in color. Dusky shark dorsal fins are similar in shape and color but have a long free rear tip.

Dusky shark (*Carcharhinus obscurus*)

Distribution: Widely distributed in warm temperate to tropical regions.
Habitat: Inshore and offshore. Taken in coastal and pelagic fisheries.

First dorsal fin description

- Fin is light grey to brownish-grey in color.

- Fin narrows towards apex; apex itself is narrowly rounded.

- Long free rear tip.

- Smooth texture with small denticles.

Similar species: White shark first dorsal fins are similar in and shape but have a shorter free rear tip. Sandbar and bull shark first dorsal fins are similar in shape and color, but they both have large, salt-grain like denticles that cover the entire fin surface and short free rear tips. Bull shark first dorsal fins are also pointed at the apex. Silky shark first dorsal fins are similar in shape and color but have a more broadly rounded apex and a convex trailing edge. Caribbean reef first dorsal fins (not included in this guide due to lack of samples for comparison) are to be similar in shape and color.

The dorsal side is the darker side of the fin, the ventral side is the lighter side. "LE" is the Leading edge of the fin, "TE" is the Trailing edge of the fin. The three fin landmarks are the Apex, Origin and Free rear tip.

(1) Dorsal side apex is broadly rounded and has white tips **(page 29)**

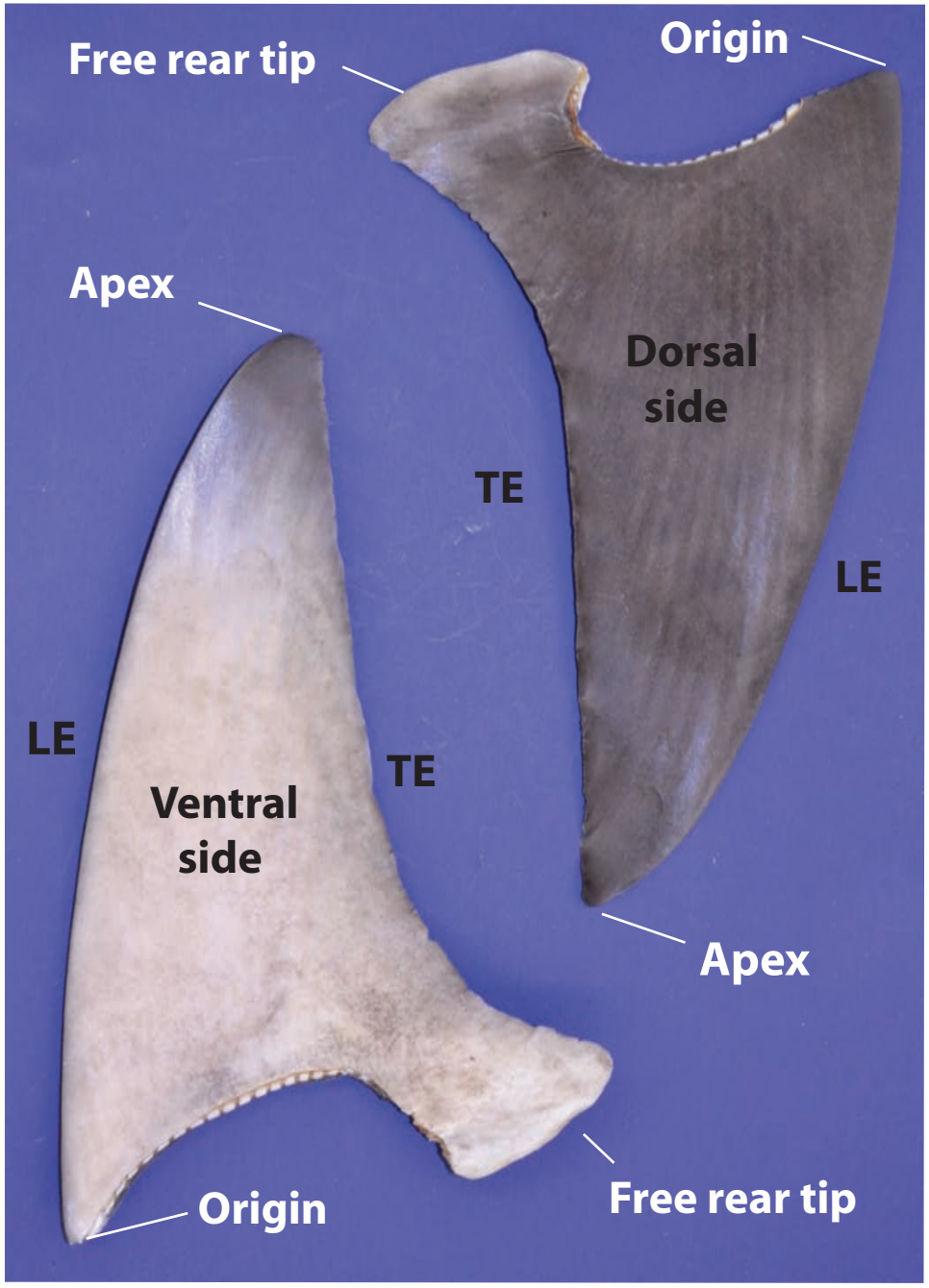
(2) Ventral side has faint to no markings **(browse pages 30-37)**

(3) Ventral side has black or dusky markings, confined mainly to apex **(browse pages 38-44)**

** Note: species in this section are extremely similar in size, shape, color.*

(4) Ventral side has black or dusky markings spread over more than a third of the fin **(browse pages 45-47)**

Pectoral Fin Landmarks



Oceanic whitetip shark (*Carcharhinus longimanus*)

Distribution: Globally distributed in tropical and subtropical regions.
Habitat: Offshore, occassionally close to shore along islands. Mostly taken in pelagic fisheries.

Pectoral fin description

The fin is long with a broadly rounded apex. The dorsal surface has a mottled white patch at the apex. Ventral surface is mostly white, but can have irregular brown or dark patches.

Similar species: None.

Sand tiger shark (*Carcharias taurus*)

Distribution: Widely distributed in warm temperate regions (absent in the North Pacific).
Habitat: Coastal and estuarine. Mostly taken in coastal fisheries.

Pectoral fin description

Dorsal surface is light brown to golden brown in color. No markings on ventral surface. Small denticles with a coarse, sandpaper-like texture. Short and broad from leading edge to trailing edge, rounded at apex and along trailing edge. Broad, rounded free rear tip.

Similar species: Nurse shark pectoral fins are similar in shape and color, but have large dark and white denticles visible on both dorsal and ventral surfaces and a smoother texture than sand tiger shark pectoral fins.

Nurse shark (*Ginglymostoma cirratum*)

Distribution: Widely distributed in warm temperate regions.
Habitat: Coastal and estuarine. Mostly taken in coastal and estuarine fisheries.

Similar species: Sand tiger pectoral fins are similar in shape and color but have smaller denticles and a rougher texture than nurse shark pectoral fins.

Pectoral fin description

Dorsal surface is reddish brown to golden brown in color. No markings on ventral surface. Large dark and white pebble-like denticles visible on both sufaces. Short and broad from leading edge to trailing edge, rounded at apex and along trailing edge. Broad, rounded free rear tip.

Smooth hammerhead shark (*Sphyrna zygaena*)

Distribution: Worldwide, in temperate regions.
Habitat: Typically Inshore, but can be found offshore. Mostly taken in coastal and pelagic fisheries.

Pectoral fin description

The dorsal surface is light brown or greyish-brown in color with a dull, smooth texture. The fin is generally short and broad, slightly convex from leading edge to trailing edge and rounded at the apex. The ventral surface lacks distinct markings.

Similar Species: Scalloped hammerhead pectoral fins are similar in shape and color, but typically have a dark patch at the apex on the ventral surface that is absent from the pectoral fin of the smooth hammerhead.

Tiger shark (*Galeocerdo cuvier*)

Distribution: Widely distributed in warm temperate to tropical regions.

Habitat: Inshore and offshore. Mostly taken in coastal fisheries, occassionally in pelagic fisheries.

Pectoral fin description

Dorsal surface is dark grey to greyish-brown in color. Rough, sandpaper-like texture. Faint to no markings on the ventral surface. Short fin, narrow at apex with a falcate trailing edge. Fins from larger specimens tend to feel lighter than other pectoral fins of similar size.

Similar species: Sandbar pectoral fins have faint to no markings on the ventral surface, but are typically lighter in color and have larger, visually obvious denticles (some of which resemble salt grains) on the dorsal surface. Great hammerhead pectoral fins have a similar shape but are more falcate along the trailing edge and have more extensive dusky markings at the apex on the ventral surface.

Sandbar shark (*Carcharhinus plumbeus*)

Distribution: Widely distributed in warm temperate to tropical regions.
Habitat: Inshore. Mostly taken in coastal and estuarine fisheries.

Similar species: Caribbean reef, bull, dusky and silky pectoral fins are similar in color and shape but have more obvious dusky markings on the ventral surface, especially at the apex.

Pectoral fin description

The dorsal surface is light brown or greyish-brown with a rough texture and large, visually obvious denticles, some of which resemble salt grains. Markings on the ventral surface are absent or consist of a faint dusky area at the apex and along the trailing edge. Free rear tip is short and narrow at the apex.

Shortfin mako shark (*Isurus oxyrinchus*)

Distribution: Worldwide in temperate to tropical regions.
Habitat: Offshore. Mostly taken in pelagic fisheries.

Pectoral fin description

Dorsal surface is dark greyish-brown or slate grey in color, with a white margin running along the edge of the free rear tip. The ventral surface is white with no markings. The fin is moderately short and broad from leading edge to trailing edge and has a rounded apex.

Similar species: Porbeagle pectorals are similar in dorsal color and shape, but have dusky markings on the ventral surface. Longfin makos (not included in this guide due to lack of sufficient samples for comparison) have longer pectoral fins, also with dark or dusky markings on the ventral surface. Blue shark pectorals have similar coloration on both sides of the fin but are longer and more slender than shortfin mako pectorals.

Blue shark (*Prionace glauca*)

Distribution: Worldwide in temperate to tropical regions.
Habitat: Offshore. Mostly taken in pelagic fisheries.

Pectoral fin description

Dorsal surface is dark grey or or dark greyish-brown in color, while the ventral surface is white with no markings. The fins are long and slender from leading edge to trailing edge and the radial cartilage is easily seen extending from the base towards the apex.

Similar species: None

Lemon shark (*Negaprion brevirostris*)

Distribution: Worldwide, warm temperate to tropical regions.
Habitat: Inshore. Mostly taken in coastal and estuarine fisheries.

Pectoral fin description

The dorsal surface of the fin is light brown or golden brown in color with a faint dusky coloration visible on the ventral surface of the fin at the apex. Visually obvious denticles (some of which resemble salt grains). The pectoral fins are broad from leading edge to trailing edge, tapering into a pointed apex. The trailing edge is falcate. The free rear tip is broadly rounded at the apex.

Similar species: Great hammerhead pectoral fins are extremely similar in shape, but have smaller denticles on the dorsal and ventral surfaces. Silky, bull, dusky and Caribbean reef (not included in this guide due to lack of sufficient samples for comparison) pectoral fins have similar obvious dusky markings on the ventral surface, but lemon pectoral fins are markedly more falcate.

Scalloped hammerhead shark (*Sphyrna lewini*)

Distribution: Worldwide, warm temperate to tropical regions.
Habitat: Inshore and offshore. Mostly taken in coastal and pelagic fisheries.

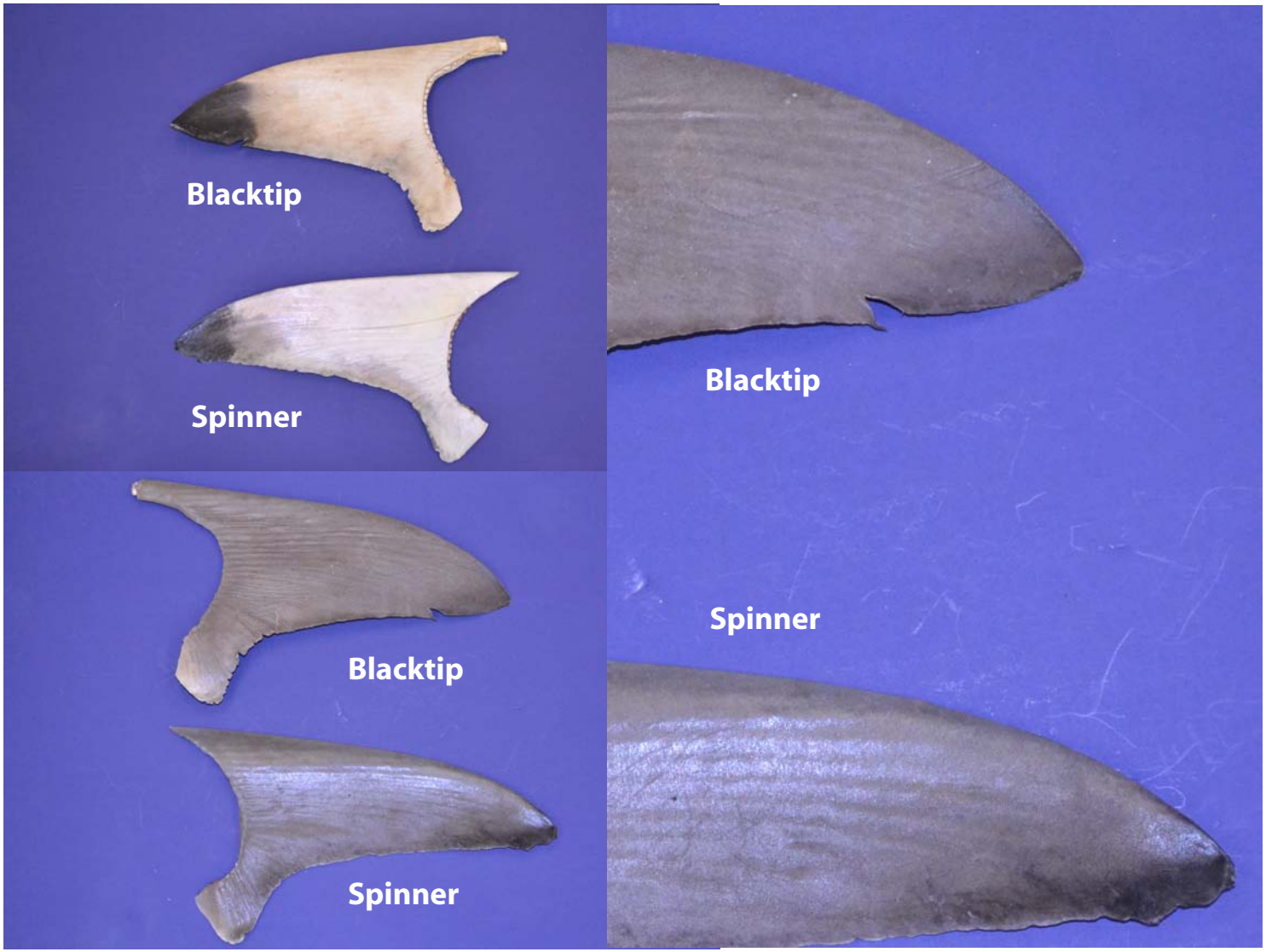
Pectoral fin description

The dorsal surface is light brown or greyish-brown in color with a dull, smooth texture. The fin is generally short and broad from leading edge to trailing edge and is a narowly rounded at the apex. Dark patch is visible on the ventral surface, concentrated at the apex.

Similar Species: Blacktip, spinner and white shark pectoral fins also have a dark patch concentrated at the apex on the ventral side, but are not as short from the base to the apex or as broad from leading edge to trailing edge as the scalloped hammerhead. Smooth hammerhead pectoral fins are similar in shape and color, but lack the dark patch concentrated at the apex on the ventral surface.

Blacktip shark (*Carcharhinus limbatus*); Spinner shark (*Carcharhinus brevipinna*)

Distribution: Worldwide, warm temperate to tropical regions.
Habitat: Inshore. Mostly taken in coastal and estuarine fisheries.



Pectoral fin description

The dorsal side of the fin is light brown or grey and has a glossy sheen. The black markings on the apex are obvious on the ventral surface and less obvious or absent altogether on the dorsal surface in blacktips (top), the black markings are typically obvious on both sides of the pectoral fin in spinners (bottom).

Similar Species: Scalloped hammerheads also have a dark patch concentrated at the apex on the ventral side of the pectoral fin, but are broader from leading edge to trailing edge than blacktip or spinner pectoral fins.

White shark (*Carcharodon carcharias*)

Distribution: Widely distributed. Most common in temperate regions but also found in tropics.
Habitat: Inshore and offshore. Mostly in coastal fisheries, possibly in pelagic fisheries.

Pectoral fin description

The dorsal side of the fin is dark brown or greyish-brown in color. Black markings at the apex are only visible on the ventral surface. The trailing edge of the fin is often ragged in appearance. The free rear tip has a white margin on the trailing edge of the dorsal surface.

Similar species: Scalloped hammerhead, blacktip and spinner pectoral fins also have black markings concentrated at the apex on the ventral surface. Scalloped hammerheads have much shorter, broader fins, while blacktip and spinners have a glossy sheen on the dorsal surface.

Great hammerhead shark (*Sphyrna mokarran*)

Distribution: Worldwide, warm temperate to tropical regions.
Habitat: Inshore. Mostly taken in coastal and estuarine fisheries.

Pectoral fin description

The dorsal surface of the fin is light grey or greyish-brown in color with a slight dusky coloration on the ventral surface of the fin at the apex. The pectoral fins are broad from leading edge to trailing edge, tapering into a pointed apex. The trailing edge is falcate. The free rear tip is broad but narrows at the apex.

Similar species: Lemon shark pectoral fins are extremely similar in shape, but are light brown to golden brown in color and have larger denticles. Sandbar pectoral fins are similar in color, but have larger denticles. Silky, bull, dusky and Caribbean reef shark pectoral fins (not included in this guide due to lack of sufficient samples for comparison) also have dusky markings on the ventral surface but the great hammerhead pectoral fin has a markedly more falcate trailing edge.

Silky shark (*Carcharhinus falciformis*)

Distribution: Widely distributed in warm temperate to tropical regions.
Habitat: Primarily offshore. Mostly taken in pelagic fisheries.

Pectoral fin description

The dorsal surface is brown to greyish-brown in color and has a smooth texture with small denticles. The fin is narrowly rounded at the apex with a visible dusky coloration at the ventral surface, has a nearly straight trailing edge (not visibly falcate) and narrow free rear tip.

Similar species: Dusky, bull, night and Caribbean reef shark pectoral fins (not included in this guide due to lack of sufficient samples for comparison) are a very similar in shape and coloration, but the dusky markings on the ventral surface are less concentrated at the apex and the trailing edge is more falcate in these species than seen in the silky. Bull pectoral fins also have larger denticles (salt grain-like).

Dusky shark (*Carcharhinus obscurus*)

Distribution: Widely distributed in warm temperate to tropical regions.
Habitat: Inshore and offshore. Taken in coastal and pelagic fisheries.

Pectoral fin description

The dorsal surface of the fin is light brown or greyish-brown in color with a slight dusky coloration on the ventral surface of the fin at the apex. The pectoral fins taper towards the apex, which is slightly pointed. The trailing edge is falcate and the free rear tip also narrows at the apex.

Similar species: Sandbar pectoral fins are similar in shape and color, but have larger denticles. Silky, night and bull pectoral fins are similar in shape, but have more obvious dusky markings on the ventral surface. Great hammerheads have a similar dusky coloration on the ventral side, but the apex is more pointed and the trailing edge is markedly more falcate than in the dusky shark.

Night shark (*Carcharhinus signatus*)

Distribution: Widely distributed in warm temperate to tropical regions.
Habitat: Primarily offshore. Mostly taken in pelagic fisheries.

Pectoral fin description

The dorsal surface of the fin is light brown or greyish-brown in color with a dusky slight coloration on the ventral surface of the fin at the apex. Moderately long fin, tapering towards a pointed apex. The trailing edge is slightly falcate.

Similar species: Dusky pectoral fins are extremely similar in shape, color and denticle size, but the free rear tip is narrower at the apex. Sandbar pectoral fins are similar in shape and color, but have larger denticles on the dorsal surface. Silky, night, bull and Caribbean reef pectoral fins (not included in guide due to lack of sufficient samples for comparison) are similar in shape, but have more obvious dusky markings on the ventral surface. Great hammerheads have a similar dusky coloration on the ventral surface, but the apex of the is more pointed and the trailing edge is more falcate.

Bull shark (*Carcharhinus leucas*)

Distribution: Widely distributed in warm temperate to tropical regions.
Habitat: Inshore and estuarine. Mostly taken in coastal, estuarine and freshwater fisheries.

Pectoral fin description

The dorsal surface is light brown or greyish-brown with a rough texture and large, visually obvious denticles, some of which resemble salt grains. Pointed apex and a dusky marking on the ventral surface that extends from the apex to the middle of the fin, and runs extensively along the trailing edge.

Similar species: Sandbar, silky, dusky, night and Caribbean reef pectoral fins (not included in this guide due to lack of sufficient samples for comparison) are similar in shape but have less obvious dusky markings on the ventral surface. Great hammerheads have a similar dusky coloration, but the apex is more pointed and the trailing edge is markedly falcate.

Porbeagle shark (*Lamna nasus*)

Distribution: Widely distributed in temperate and subpolar regions (absent in North Pacific).
Habitat: Pelagic. Mostly taken in pelagic fisheries.

Pectoral fin description

The fin is short, broad from leading edge to trailing edge with a rounded apex. The dorsal surface is dark, slate grey or greyish-brown or in color, with a white margin running along the leading edge of the free rear tip. The ventral surface is dark along the leading edge, and from the apex throughout the middle of the fin.

Similar species: Shortfin mako pectoral fins have a similar shape and the dorsal surface is a similar color but the ventral side is completely white, lacking the dark coloration of porbeagle pectoral fin. White shark pectoral fins also have a similar shape and color on the dorsal side but have black markings on the ventral surface that are confined to the fin apex.

Common thresher shark (*Alopias vulpinus*)

Distribution: Worldwide in temperate regions.
Habitat: Typically offshore but does come inshore. Mostly taken in pelagic fisheries.

Pectoral fin description

Dorsal surface is slate grey or dark greyish-brown in color. The ventral surface is just as dark, with mottled white markings at the base of the fin. Long, slender from leading edge to trailing edge, curving sharply at the apex. Very small white spot often (but not always) present at the tip of the apex, visible on dorsal and ventral sides. Radial cartilage is large and easily seen extending from the base towards the apex.

Similar species: The bigeye thresher pectoral fins (not included in this guide due to lack of sufficient samples for comparison) are suspected to be very similar in shape and coloration.

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