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Identification: Target and Non-target Fish Species

IOTC ROS SFO TR9



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Sharks and Rays Identification

IOTC ROS SFO TR9.5

Category: Identification Target and Non-target Fish Species

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Manta rays and devilrays - Mobulidae



Thresher sharks - Alopiidae



Requiem sharks - Carcharhinidae



Hammerhead sharks - Sphyrnidae



Whale sharks - Rhindodontidae



Stingrays - Dasyatidae



Mackerel sharks - Lamnidae



Kitefin sharks - Dalatiidae



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There are many different families and species of sharks and rays, training will focus on the IO species most commonly caught by the large pelagic fisheries. These include:

- **Thresher sharks (Alopiidae)**, easily identifiable due to their characteristic shape of the caudal fin, with an upper lobe length equal to the length of the rest of the body.
- **Requiem sharks (Carcharhinidae)**, one of the largest family of sharks with 54 species. Many of these species are similar and their identification can be difficult. The most important identification features are the tooth shapes, the position of dorsal fins and the presence or absence of an inter-dorsal ridge.
- **Hammerhead sharks (Sphyrnidae)**, easily identifiable due to the shape of their heads which is similar to a hammer.
- **Whale sharks (Rhindodontidae)**, a single species family for the largest shark in the ocean. They are planktonic feeders and occur in all tropical waters around the globe.
- **Mackerel sharks (Lamnidae)**, are large sharks with a conical and pointed snout, small second dorsal and anal fins, large lateral keels and prominent precaudal pits.
- **Kitefin sharks (Dalatiidae)**, are small cylindrical sharks, that miss the anal fin. They are mostly deep-water sharks.
- **Manta rays and devilrays (Mobulidae)**, are the largest rays, their body is wider than long with one cephalic lobe on each side of the head.
- **Stingrays (Dasyatidae)**, disc shape can vary from circular to rhomboidal. The tail is missing dorsal, anal or caudal fin and has in general one or more stinging spines.



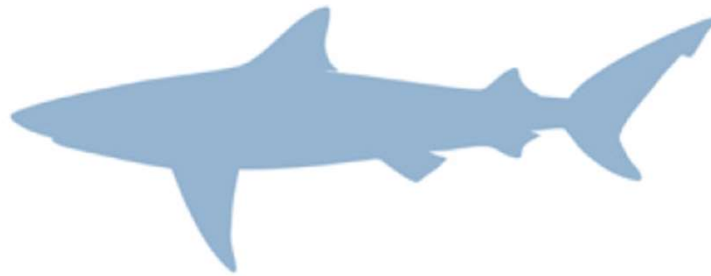
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CARCHARHINID SHARKS


Family: Carcharhinidae



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Requiem sharks (Carcharhinidae), one of the largest family of sharks with 54 species. Many of these species are similar and their identification can be difficult. The most important identification features are the tooth shapes, the position of dorsal fins and the presence or absence of an inter-dorsal ridge.



| | | |
|---|--|--|
| <p>BSH</p> <p>BLUE SHARK <i>Prionace glauca</i></p> | <ul style="list-style-type: none"> • Long, narrow snout. Long head • Long, slender “flabby” body | <ul style="list-style-type: none"> • Very long, slender pectoral fins |
| |  | |
| <ul style="list-style-type: none"> • Dorsal surfaced deep iridescent blue fading to blue with white ventral surfaces | | |



BLUE SHARK - *Prionace glauca* (BSH)

Species mainly targeted by the pelagic longline fisheries. Can also be caught by the gillnet fisheries. Not commonly caught by the tuna purse-seine or the tuna pole and line surface fisheries.

Identifying characters:

- Long, narrow snout with long head
- Long, slender “flabby” body
- Very long, slender pectoral fins
- First dorsal fin closer to pelvic fins than pectoral fins
- Small gill slits
- Weak ridge on caudal peduncle
- Dorsal surfaced deep iridescent blue fading to blue with white ventral surfaces



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Note:

- Long pectoral fins
- Small, low dorsal fin
- Irrescent blue colour



| | | |
|---|--|---|
| TIG TIGER SHARK <i>Galeocerdo cuvier</i> | <ul style="list-style-type: none">• Broad, wide, flattened head. Wide and very blunt snout | <ul style="list-style-type: none">• Dark, vertical barring pattern covering most of body. Juveniles spotted not striped |
| |  | |
| | <ul style="list-style-type: none">• Upper teeth are distinctively shaped and strongly serrated. Terminal point of each tooth hooks laterally instead of forming a triangular shape | |

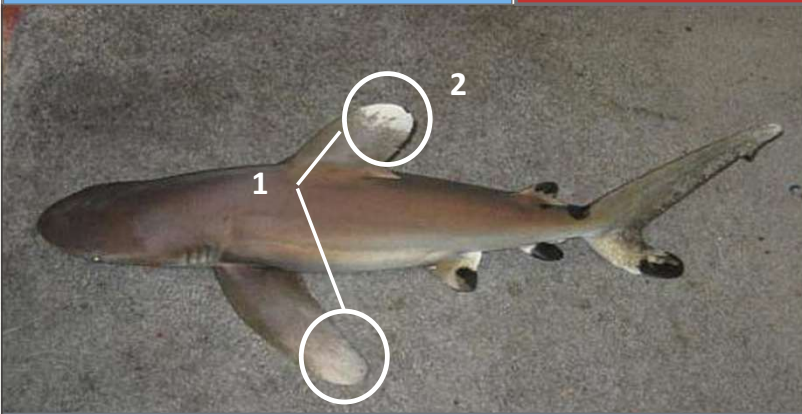


Tiger shark - *Galeocerdo cuvier* (TIG)

Identifying characters:

- Dark, vertical barring pattern covering most of body
- Broad, wide and flattened head
- Barring pattern is spotted in juveniles and may fade in large adults
- Upper teeth are distinctively shaped and strongly serrated. Terminal point of each tooth hooks laterally instead of forming a triangular shape
- Wide and very blunt snout
- Juveniles spotted instead of striped



| | | |
|---|---|---|
| <p>OCS</p> <p>OCEANIC WHITETIP SHARK <i>Carcharhinus longimanus</i></p> | <p>1. Large pectoral and first dorsal fins with white or mottled tips</p> | <p>2. Dorsal fin is fully rounded at tip</p> |
| |  <p>• Body colour typically brown, white ventrally. May have black markings on the tips of pelvic, anal, second dorsal and lower caudal fins and a black patch on the upper caudal peduncle</p> | |



Oceanic whitetip shark – *Carcharhinus longimanus* (OCS)

Identifying characters

- Large pectoral and first dorsal fins with white or mottled tips
- Large individuals have fin spots that are indistinct or faded
- Dorsal fin is fully rounded at tip
- Flattened head and rounded snout
- Body colour typically brown, white ventrally
- May have black markings on the tips of pelvic, anal, second dorsal and lower caudal fins and a black patch on the upper caudal peduncle



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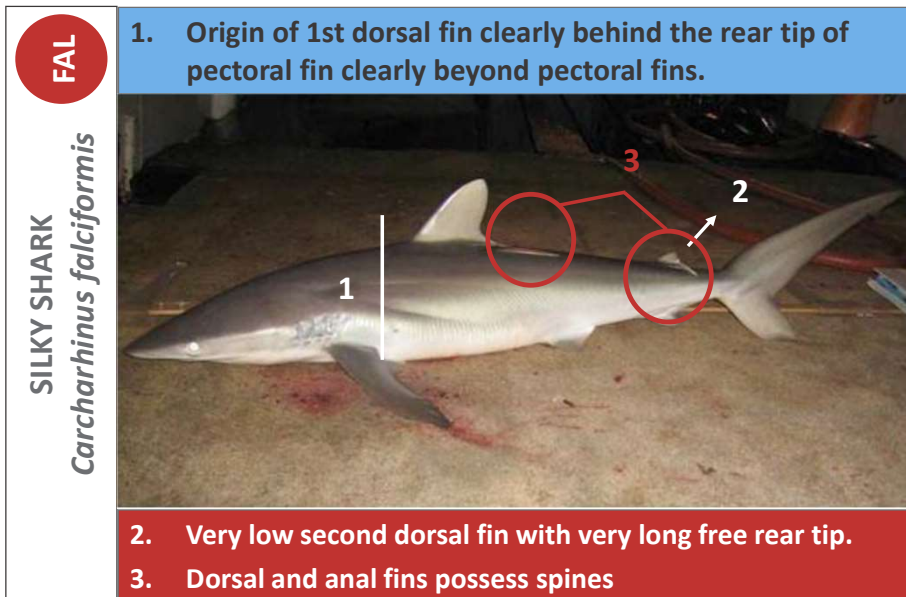


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Oceanic whitetip shark – *Carcharhinus longimanus* (OCS)

Note:

- Rounded white tips of the pectoral fin
- Flattened head and rounded snout



Silky shark – *Carcharhinus falciformis* – FAL

Very common in offshore fisheries, in particularly tuna purse-seine fisheries.

Identifying characters

- 1st dorsal fin is small
- Origin of 1st dorsal fin clearly behind the rear tip of pectoral fin clearly beyond pectoral fins
- Low inter-dorsal ridge
- No ridge or keel on caudal peduncle
- Copper-brown body fading to white, white ventrally
- Body completely clear of markings
- Ventral side of caudal fin tips black or dark



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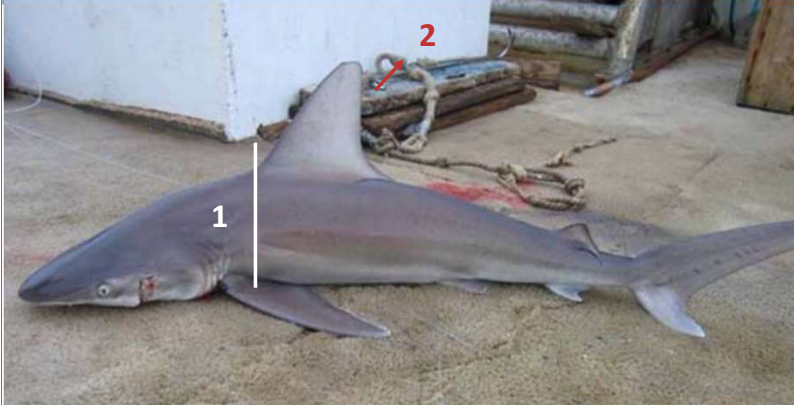


Silky shark – *Carcharhinus falciformis* – FAL

Note:

- Eye pupil small with vertical slits
- Dark tip on ventral surface of pectoral fin
- Long pectoral fins
- Long free rear tips on first and second dorsal and second anal fin with spines



| | |
|---|--|
| CCP SANDBAR SHARK <i>Carcharhinus plumbeus</i> | 1. Origin of 1st dorsal fin over the base of the pectoral fin |
| | 2. Very tall first dorsal fin |
| |  |
| ➤ Grey to brown-grey body coloration with no spots or patterns on body or fins | |



Sandbar shark – *Carcharhinus plumbeus* - CCP

Identifying characters

- Very tall, triangular first dorsal fin
- Origin of first dorsal fin over or in front of rear margin of pectoral fins
- No inter-dorsal ridge
- Grey to brown-grey body coloration with no spots or patterns on body or fins
- Short, blunt snout



Sandbar shark – *Carcharhinus plumbeus* – CCP

Note:

- Body coloration
- Large, triangular first dorsal fin
- Origin of first dorsal fin above pectoral fin



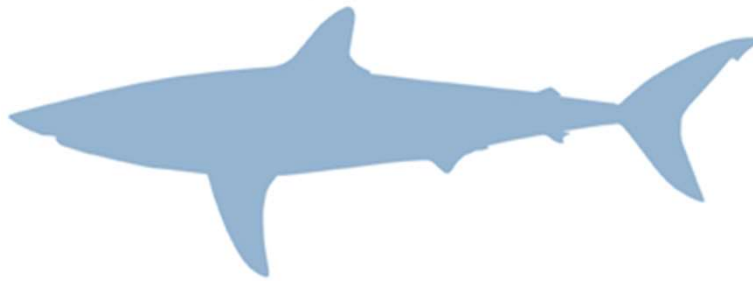
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LAMNID SHARKS

Family: Lamnidae



Mackerel sharks (Lamnidae), are large sharks with a conical and pointed snout, small second dorsal and anal fins, large lateral keels and prominent precaudal pits.



SMA

SHORTFIN MAKO
Isurus oxyrinchus

➤ Pectoral fins shorter than head

➤ Head conical and snout pointed



➤ Dark blue to cobalt blue on back, white belly and ventral surfaces

Shortfin mako – *Isurus oxyrinchus* – SMA

Identifying characters

- Conical, pointed snout
- Caudal fin crescent shaped with large caudal keels
- Length of pectoral fins is less than head length
- Dark blue to cobalt blue on back, white belly and ventral surfaces
- Long exposed teeth without serrations
- Long gill slits



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Long exposed teeth without
serrations

Dark blotch of colour found at
base of pectoral fins



Shortfin mako – *Isurus oxyrinchus* – SMA

Note:

- Dark blotch of colour found at base of pectoral fins
- Conical, pointed snout
- Long exposed teeth without serrations



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Shortfin mako – *Isurus oxyrinchus* – SMA

Note stocky body, short pectoral fins and prominent caudal keels



| | |
|---|---|
| <p>LMA</p> <p>LONGFIN MAKO <i>Isurus paucus</i></p> | <p>➤ Very long pectoral fins, as long as head</p> <p>➤ Head pointed but snout rounded</p> |
| |  |
| | <p>➤ Upper and lower lobes of tail nearly the same length</p> |



Longfin mako – *Isurus paucus*– LMA

Identifying characters

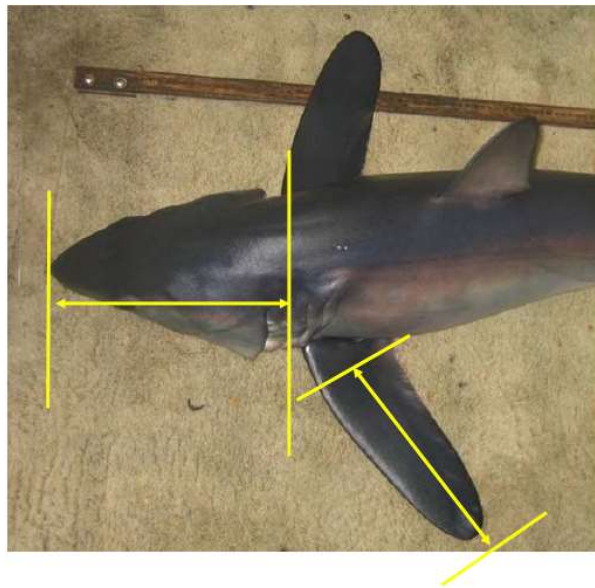
- Pectoral fins as long or longer than head length with rounded tips
- Long, conical snout but slightly rounded compared to short finned mako
- Caudal fin strongly crescent shaped with large caudal keels and short secondary keels on the caudal base
- Grey blue back and dorsal surfaces with grey mottling on mandible
- Long blade-like teeth without serrations



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Longfin mako – *Isurus paucus*– LMA

Note:

- Head length versus pectoral fin length
- Grey-blue coloration

THRESHER SHARKS

Family: Alopiidae



Thresher sharks (Alopiidae), are easily identifiable due to their characteristic shape of the caudal fin, with an upper lobe length equal to the length of the rest of the body.

These very large sharks often float to the surface when subdued by a shock node. The ridge behind the head, large, upward tilted eyes and very long caudal fin make them easy to identify. They can sometimes be confused with pelagic or common thresher sharks when smaller.



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- Prominent groove on the dorsal surface of the head
- Eye socket extends to the top of the head



- Tip of pectoral fins rounded
- No labial furrow, no groove
- Extremely long, thin upper lobe of caudal fin



- Pectoral fin tips are pointed
- Labial furrow at the back of the mouth (groove)
- Margin between dark and light colours is irregular



Observer are to be able to identify three species of thresher sharks, all with a prohibition of retention:

- Bigeye thresher (*Alopias superciliosus*) – BTH
- Pelagic thresher (*Alopias pelagicus*) - PTH
- Common thresher (*Alopias vulpinus*) - ALV



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- Enormous eyes, placed in keyhole-shaped sockets
- Pair of deep grooves on the top the head

The bigeye thresher (*Alopias superciliosus*) is a species of thresher shark, family Alopiidae, found in temperate and tropical oceans worldwide. Its common name comes from its **enormous eyes, which are placed in keyhole-shaped sockets** that allow them to be rotated upward. This species can also be distinguished by a **pair of deep grooves on the top of its head**, from which its scientific name is derived. The large eyes of the bigeye thresher are adapted for hunting in low light conditions. It is one of the few sharks that conduct a diel vertical migration, staying in deep water during the day and moving into surface waters at night to feed. This shark is **caught by commercial fisheries** across its range; the meat is not highly regarded but the skin, fins, and liver oil are valued. It has been assessed as Vulnerable by the International Union for Conservation of Nature (IUCN), and **its retention on-board is prohibited by the IOTC**.



- Dark, rather than white colour over the bases of pectoral fins
- Tip of pectoral fins rounded

The pelagic thresher (*Alopias pelagicus*) is a species of thresher shark, family Alopiidae, that occurs in the tropical and subtropical waters of the Indian Ocean, usually far from shore, but occasionally entering coastal habitats. It is often confused with the common thresher (*A. vulpinus*), but can be distinguished by the dark, rather than white colour over the bases of its pectoral fins. Pelagic threshers are valued by commercial fisheries for their meat, skin, liver oil, and fins. The International Union for Conservation of Nature assessed this species as endangered in 2019, and **its retention on-board is prohibited by the IOTC.**



- White, rather than dark colour over the bases of its pectoral fins
- Tip of pectoral fins pointy

The common thresher (*Alopias vulpinus*), is the largest species of thresher shark, family Alopiidae. The common thresher resembles (and has often been confused with) the pelagic thresher (*A. pelagicus*). It can be distinguished from the latter species by the **white of its belly extending in a band over the bases of its pectoral fins**. The common thresher is distributed worldwide in tropical and temperate waters, though it prefers cooler temperatures. It can be found both close to shore and in the open ocean.

It is highly valued by commercial fishers for its meat, fins, hide, and liver oil; large numbers are taken by longline and gillnet fisheries throughout its range. The International Union for Conservation of Nature has assessed this species as vulnerable and **its retention on-board its prohibited by the IOTC**.



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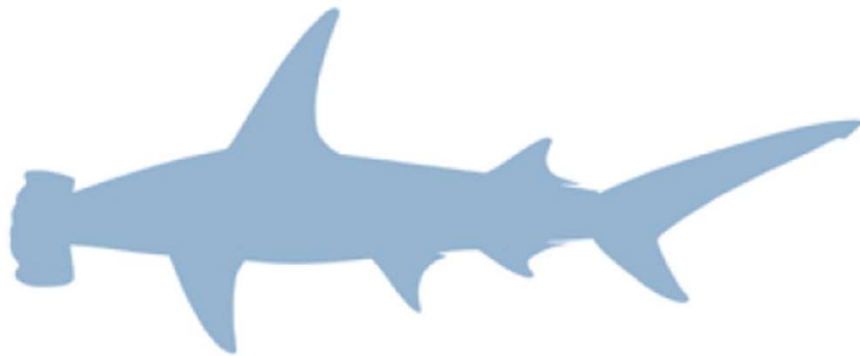


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HAMMERHEAD SHARKS

Family: Sphyrnidae



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Hammerhead sharks (Sphyrnidae), are easily identifiable due to the shape of their heads which is similar to a hammer. These species are widely distributed in tropical and warm temperate waters.

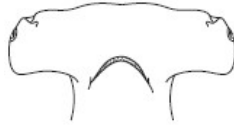


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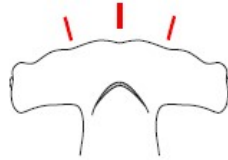


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Great hammerhead: Anterior margin of head nearly straight. Small indentation in the middle



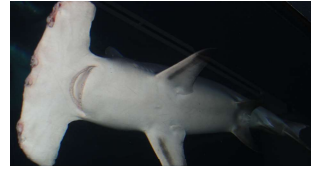
Scalloped hammerhead: Anterior margin of head curved with middle marked dent and a distinct lobe at each end



Smooth hammerhead: Anterior margin of head curved median indentation absent or not well marked

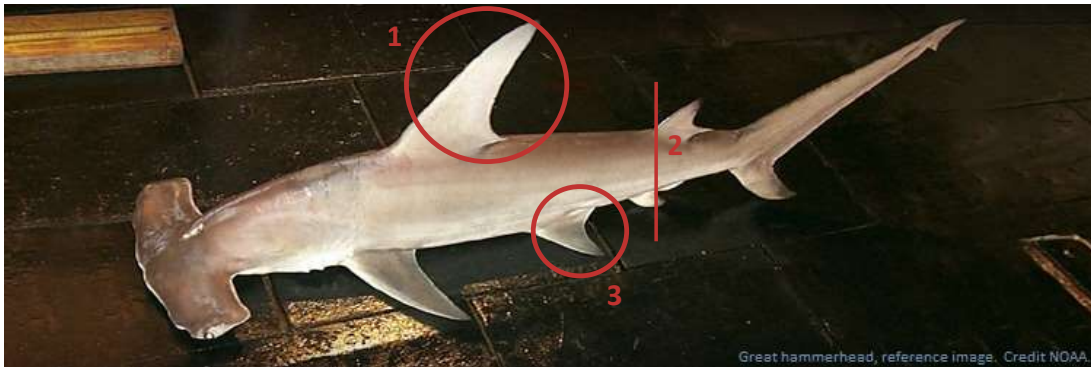


Winghead shark: Head width nearly half of body length



Observer are to be able to identify four species of hammerhead sharks:

- Great hammerhead (*Sphyrna mokarran*) – SPK
- Scalloped hammerhead (*Sphyrna lewini*) - SPL
- Smooth hammerhead (*Sphyrna zygaena*) – SPZ
- Winghead shark (*Eusphyra blochii*) - EUB



Great hammerhead, reference image. Credit NOAA.

1. Falcate 1st dorsal fin very high
2. Origin of second dorsal fin over origin of anal fin
3. Strongly falcate pelvic fin



Great hammerhead (*Sphyrna mokarran*) – SPK

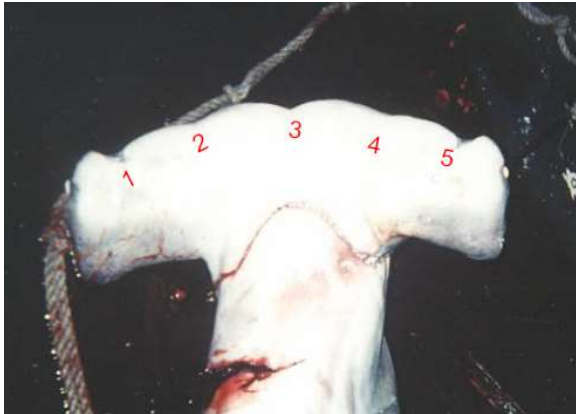
They're recognizable by their falcate sickle-shaped 1st dorsal fin that is very high and their straight head. Other species of hammerhead have a curved head.



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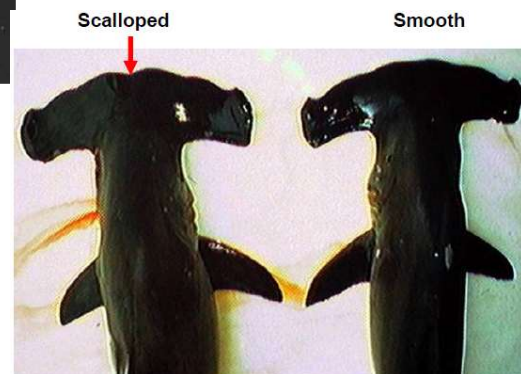


- 5 notches in head with distinct central notch
- 4 weak lobes in leading edge of head



SPECIES COMPARISON:

- Difference in terminal head structure



Scalloped hammerhead (*Sphyrna lewini*) – SPL

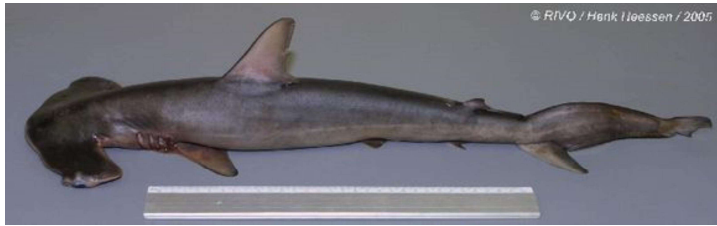
This species' head has narrow blades, and the outer edge has a notch in the centre and indentations resembling the shell of some scallops.



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- Three shallow notches in the leading edge of the head with NO central notch
- Head notches create three weak lobes
- Brown or grey dorsal coloration, white ventrally

Smooth hammerhead (*Sphyrna zygaena*) – SPZ

This species is named "smooth hammerhead" because of the distinctive shape of the head, which is flattened and laterally extended into a hammer shape, without an indentation in the middle of the front margin (hence "smooth"). Unlike other hammerheads, this species prefers temperate waters and occurs worldwide at medium latitudes.



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➤ Head width nearly half of
body length



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Winghead shark (*Eusphyra blochii*) – EUB or slender hammerhead, has a very large, wing-shaped head with narrow blades (can be as wide as half of the shark's total length). These sharks are medium-sized, with maximum lengths of about 1.8 meters. Winghead sharks are found in shallow, tropical waters.



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ANY QUESTIONS?



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