

Field identification guide to Western Australian **Sharks and Shark-like Rays**

R. McAuley, D. Newbound, R. Ashworth



Department of Fisheries
Government of Western Australia



Fish for the future



F I S H E R I E S
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C O R P O R A T I O N

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Introduction

Sharks and their relatives (the skates, rays and chimeras) are a highly diverse group of fish that evolved over 400 million years ago. These fish (collectively called Chondrichthyes) are characterised by a cartilaginous skeleton; multiple gill openings; skin covered with modified teeth instead of scales and external male reproductive organs. Over 160 species of sharks are known to inhabit Australian seas, although new species continue to be discovered. Sharks have been so evolutionarily successful that they inhabit all aquatic habitats: from freshwater rivers and lakes to ocean depths of thousands of metres.

As 'apex predators', many shark species occupy the very top level of the food chain and thereby play an essential role in maintaining the health of the marine environment. As well as their environmental importance, sharks provide a valuable resource for both the fishing and tourism industries, and chemical compounds derived from shark products are being examined for their potential pharmaceutical uses, particularly for cancer and arthritis treatments.

Despite their significance, sharks are a poorly understood group which urgently require further scientific study. As a first step, this guide is intended to improve the standard of identification and shark-catch reporting in Western Australia's widespread and varied fisheries. The information that we hope you will be able to provide is crucial in ensuring that these species survive into the future.

The information for this guide has been compiled from the following sources:

Data and photographs collected by staff from the Shark Research Section of the Department of Fisheries, Western Australia;

Last, P. R. and Stevens, J. D. 1994. *Sharks and Rays of Australia*. CSIRO, Melbourne, Australia. 513pp;

Compagno, L.J.V. 1984. *FAO Species Catalogue, Vol. 4., Sharks of the World*. An annotated and illustrated catalogue of sharks known to date. FAO Fisheries Synopsis No. 125;

Allen, G. R. and Swainston, R. G. 1988. *The Marine Fishes of North-western Australia*. A field Guide for anglers and divers. Western Australian Museum, Perth, Western Australia;

and the authors' personal observations.

How to use this guide

Section 1 provides a guide to each family of sharks and 3 families of shark-like rays. These have been included because of their biological and ecological similarity to sharks. This section is ordered according to each family's usual habitat: deep water, open ocean, coastal waters near the seafloor and coastal waters on the seafloor. However, because most sharks are highly mobile, members of each family may in fact occur in any of these habitats. Each family description also provides a colour-coded list of the most common or otherwise significant species within that family. The colour-coding corresponds to the coloured ranges in the map. (e.g. the green range on the map refers to the green species in the list). Species lists are not provided for families which contain numerous species or where species are too similar to distinguish easily.

Section 2 provides a more detailed species-level guide to the whaler sharks (family Carcharhinidae), which are of particular interest because they are commonly caught by a wide variety of Western Australian fisheries.

Features which are highlighted in red are key identifying features that can be used quickly and reliably to distinguish a particular species or family.

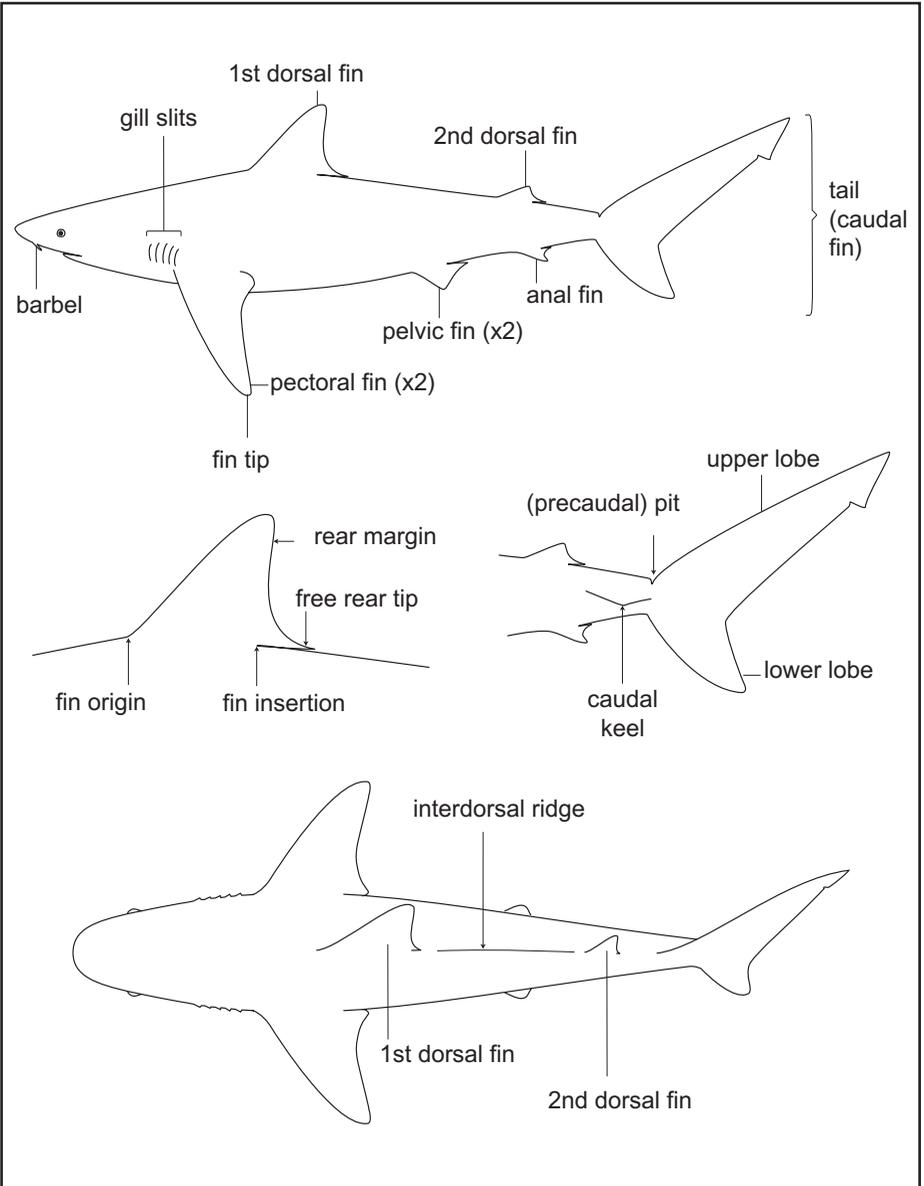
A diagram and glossary of technical terms are provided on pages v and vi.

All lengths referred to in this guide are approximate total lengths.

Acknowledgments

The authors wish to thank all those who provided suggestions for improving this guide, particularly Rod Lenanton, Rick Fletcher, Steve Newman from the WA Marine Research Laboratory and Peter Last from CSIRO Marine Research.

Anatomy of sharks



Glossary

asymmetrical: uneven in size

barbel: a slender sensory flap of skin on snout that aids with touch and/or smell

concave: curving inwards

conical: cone-shaped

continental shelf: the part of the sea floor adjacent to the coast (to about 200m depth)

cusps: points or projections on teeth

dorsal: refers to the upper side of the shark

fin origin: the point of attachment of a fin closest to the front of the shark

fin insertion: the point of attachment of the fin to the shark body on the back margin

fin spines: bone-like spines on the front margins of the dorsal fins of some species of shark

fusiform: cylindrical in the middle and tapering towards each end

dusky: grey to black colouration

flank: side of the shark's trunk

interdorsal ridge: raised skin ridge between the first and second dorsal fins

lateral: refers to the side of the shark

lateral line: a row of pores along the flank opening into a channel lined with sensory cells

lobe: flap (often of skin)

margins: edges; in this guide refers to the edges of fins

nasal: refers to the nostril(s)

nictitating membrane: moveable membrane that protects the eyes

opaque: cloudy, not clear

respiratory: involved with respiration (breathing)

serrated: saw-like or jagged

spiracle: a respiratory opening behind the eyes

translucent: allows light through but not totally transparent

ventral: refers to the lower side of the shark

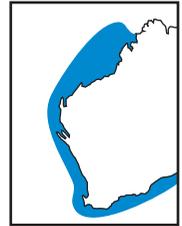
SECTION 1

SHARK AND SHARK-LIKE RAY FAMILIES

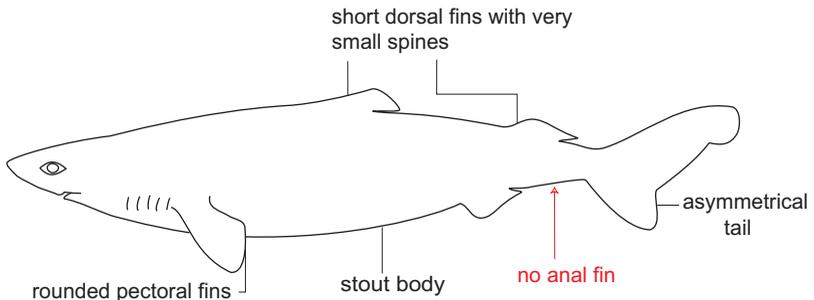
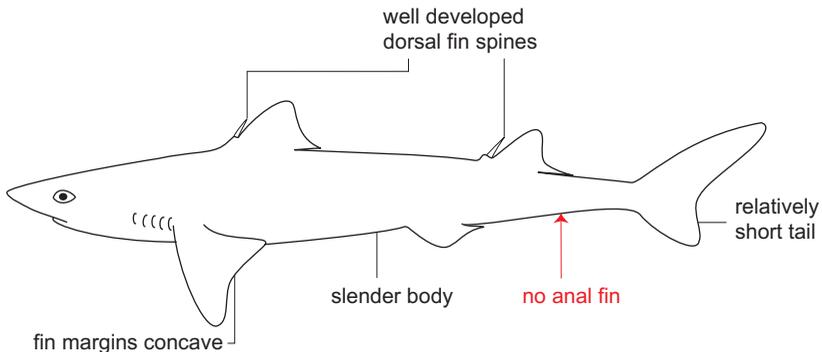
1.1 DEEP WATER

1.1.1 Dogfish (family Squalidae)

A large family (at least 27 species in W.A.) of mainly **deep water** sharks with many different body forms which can be distinguished by the **lack of an anal fin**. Most species have spines on both dorsal fins, small gill slits and large round eyes which are often green. Found mainly near the bottom. Dorsal colour may be pink, brown, greyish or black. Mostly pale ventrally; some species with dark or white fin tips. From 25cm to 600cm when mature; most between 100cm and 150cm.

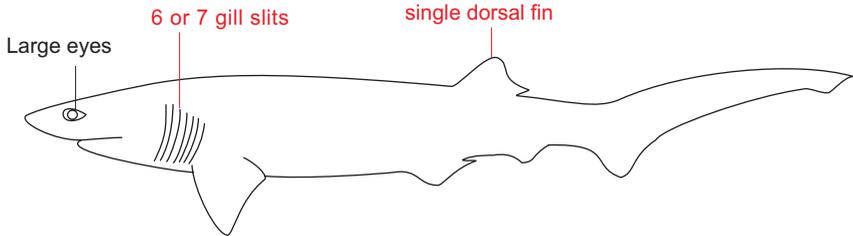


Two forms are given as examples:



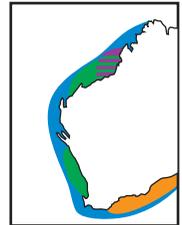
1.1.2 Sixgill & sevengill sharks (family Hexanchidae)

Easily identified, medium to large, fusiform shaped sharks which have **6 or 7 gill slits**. 4 species in W.A. Generally live near the bottom in deep water. Greyish brown or black colouration, sometimes with darker spots or blotches. From 25cm to 480cm.



Significant species in WA:

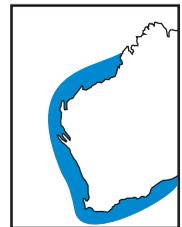
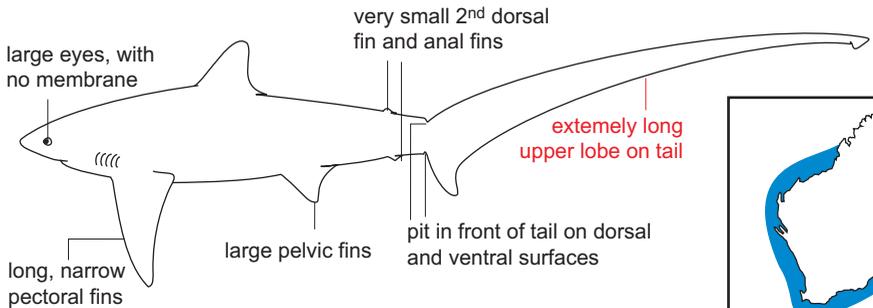
- Bigeye sixgill:** Large eyes, 6 gill slits & blunt pointed snout.
- Bluntnose sixgill:** Blunt, rounded snout; 6 gill slits.
- Broadnose sevengill:** Blunt, rounded snout; 7 gill slits.
- Sharpnose sevengill:** Pointed snout; 7 gill slits.



1.2 OPEN OCEAN

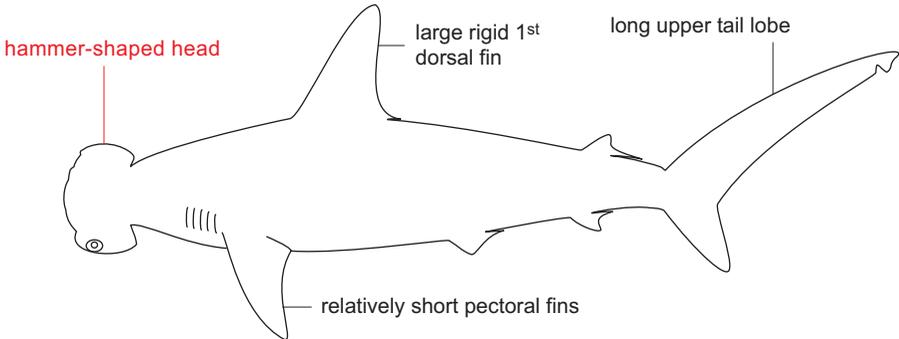
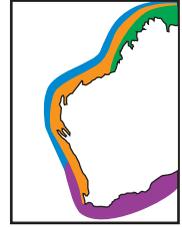
1.2.1. Thresher sharks (family Alopiidae)

Large oceanic sharks with a characteristically long upper tail lobe, which is used for catching prey. 3 species in W.A. Grey, blue-grey or purple dorsal surface, white ventral surface. From 100cm to 550cm.



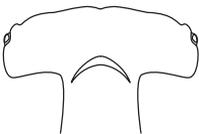
1.2.2 Hammerhead sharks (family Sphyrnidae)

Medium to large species with a deep but narrow body shape and unique hammer-shaped heads, which aid manoeuvrability and may increase these sharks' sensory perception. 4 species in W.A. Occur in continental shelf and near-shelf waters from the surface to the bottom. From 45cm to 600cm.



Significant species in WA:

Great Hammerhead



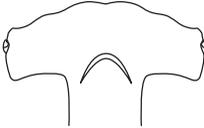
Front edge of head nearly flat, with a central indentation.

Olive or greyish brown dorsal colouration.

Tall 1st dorsal fin with a pointed tip.

Heavily serrated teeth.

Scalloped Hammerhead



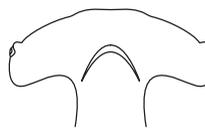
Head bulging forward toward middle, with a central indentation and scalloped front edge.

Olive or greyish dorsal colouration.

Dusky tipped pectoral fins.

Smooth-edged teeth.

Smooth Hammerhead



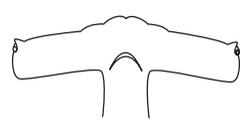
Head bulges forward, but no central indentation.

Greyish dorsal colouration.

Dusky tipped pectoral fins.

Finely serrated teeth.

Winghead shark



Long narrow blades on head (head nearly half body length).

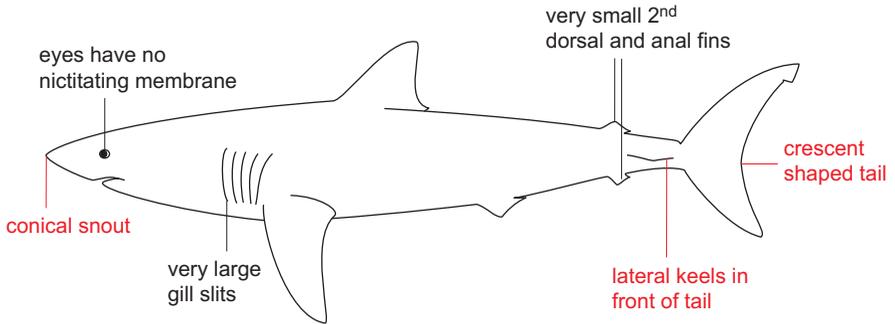
Light to dark grey dorsal colouration.

Short triangular pectoral fins.

Smooth-edged teeth.

1.2.3 Mackerel sharks (family Lamnidae)

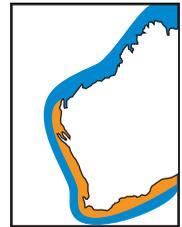
Large, fast swimming species of sharks with bullet-shaped bodies, rigid fins and conical snouts. 3 species in W.A. Inhabit continental shelf and oceanic waters where they may be found either on the surface or swimming close to the bottom. To 600cm (unsubstantiated records to > 700cm).



Significant species in WA:

Great White: Grey dorsal surface and white undersides. Triangular, serrated teeth. Born 130cm; to 600cm. **PROTECTED SPECIES IN WESTERN AUSTRALIA; penalties of up to \$20,000.**

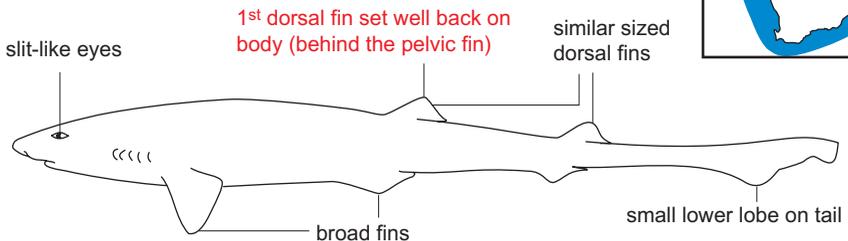
Shortfin Mako: Indigo-blue dorsal surface and white undersides. Long, slender teeth protruding from mouth. 70cm to 400cm.



1.3 COASTAL WATERS NEAR SEAFLOOR

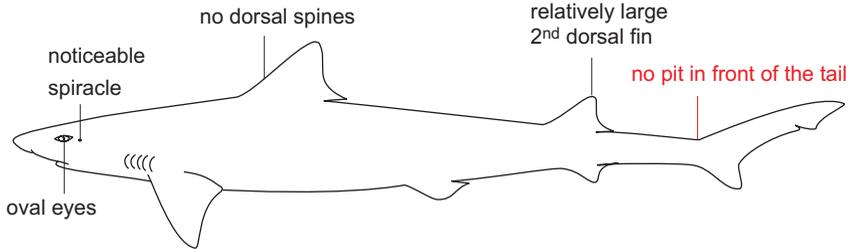
1.3.1 Catsharks (family Scyliorhinidae)

A large family (21 species in W.A.) of small slender sharks characterised by long bodies; short, broad and slightly flattened heads; narrow mouths and usually no nasal barbels. Brown, grey or black on dorsal surface; may be speckled, have spots or broad bands. From 19cm to 100cm.



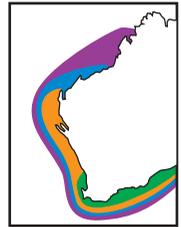
1.3.2 Hound sharks (family Triakidae)

Small to medium sized sharks with slender fusiform bodies. 9 species in W.A. Found near the seabed in continental shelf habitats. This family contains a number of commercially important species. From about 25cm, to 175cm.



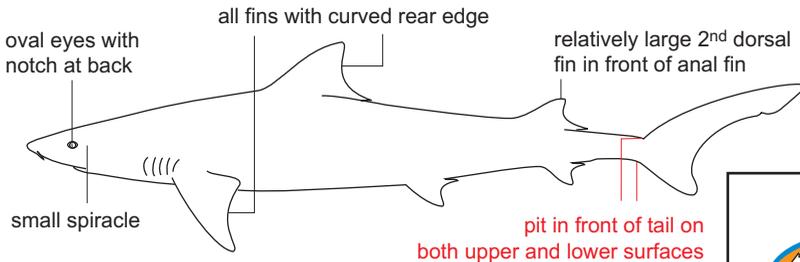
Significant species in WA:

- Gummy sharks:** (Possibly 3 species). Medium build. Grey/brown, generally covered with white spots.
- Pencil shark:** Relatively slender body. Greyish bronze dorsally; snout opaque.
- School shark:** Greyish bronze dorsally; large lower tail lobe and small 2nd dorsal fin; south eastern WA only.
- Whiskery shark:** Tan coloured with large dark blotches and small simple nasal barbels.



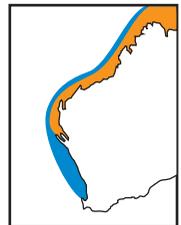
1.3.3. Weasel sharks (family Hemigaleidae)

Medium sized sharks with fusiform bodies, which inhabit continental shelf waters, close to the bottom. 2 species in W.A. Light bronze to greyish above, pale underside. 2nd dorsal fin and upper tail tips dark, but fades in larger sharks. Born at 30cm, reaching 230cm.



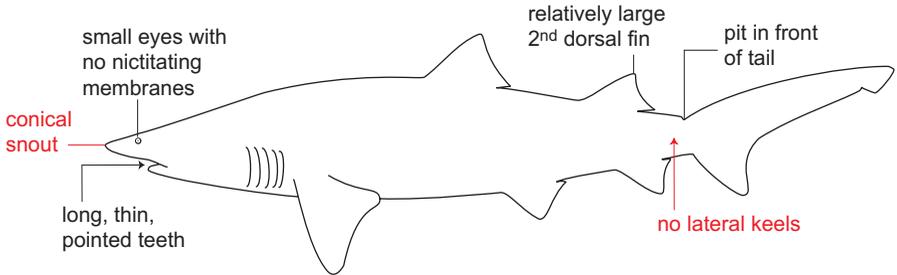
Significant species in WA:

- Fossil shark:** Protruding teeth.
- Weasel shark:** Long triangular nasal lobes and distinct lateral line.



1.3.4 Grey nurse sharks (family Odontaspidae)

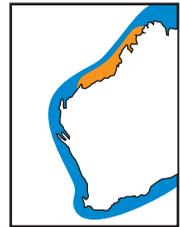
Large, stout-bodied sharks with distinctive, almost cone-shaped snouts; long, thin, pointed teeth and broad floppy fins. 2 species in W.A. Inhabit continental shelf waters and usually occur close to the bottom. Despite their menacing appearance they are considered harmless. Born at 100cm and reach 360cm.



Significant species in WA:

Grey Nurse Shark: Brown to dark brown, usually with darker spots. 1st and 2nd dorsal fin of similar size. **PROTECTED SPECIES IN WESTERN AUSTRALIA; penalties of up to \$20,000.**

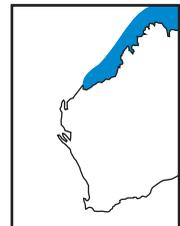
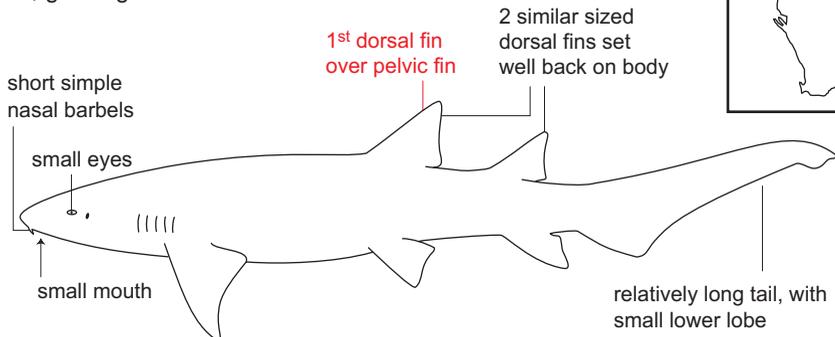
Sand tiger shark: Grey colour without prominent spots. 2nd dorsal fin smaller than 1st.



1.4 COASTAL WATERS ON SEAFLOOR

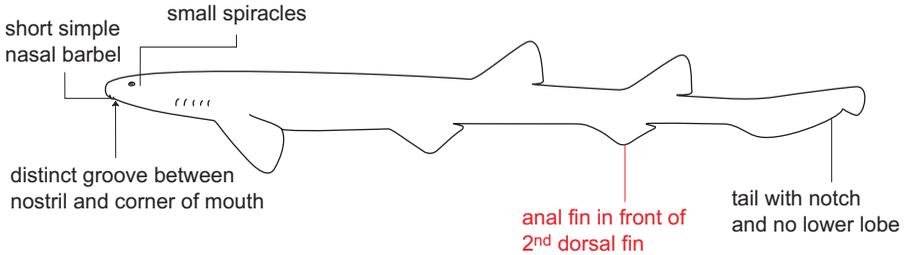
1.4.1 Nurse shark (family Ginglymostomatidae)

Represented in WA by a single species (**tawny nurse**) which is found in coastal waters close to the bottom. Simple nasal barbels. Tan coloured dorsal surface with no markings and pale ventrally. Born at 40cm, growing to 320cm.



1.4.2 Collared carpet sharks (family Parascylliidae)

Small, slender sharks with cigar-shaped bodies. 3 species in W.A. Temperate coastal waters to the edge of the continental shelf. Found on the bottom. To 86 cm.

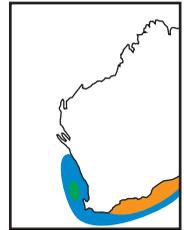


Significant species in WA:

Ginger carpet shark: Pale greyish brown dorsal colouration; < 6 dark spots between dorsal fins on each flank; deep water species.

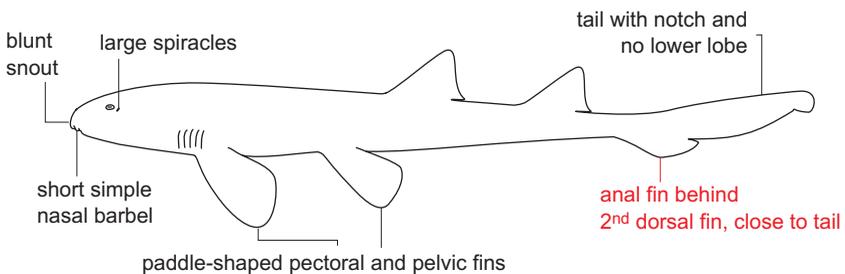
Rusty carpet shark: Greyish brown dorsal colouration; > 6 dark spots on each flank between dorsal fins; shallow water species.

Varied carpet shark: White spots over greyish brown body & bold black blotches on fins; dark collar around gills & many white spots.



1.4.3 Longtail carpet sharks (family Hemiscylliidae)

Small, slender sharks with bulbous blunt heads. 3 species in W.A. Tropical shallow water habitats, found on the bottom. Reaching 100cm.

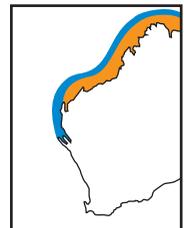


Significant species in WA:

Epaulette shark: Yellow/brown colouration; large black spot above pectoral fin and smaller well-spaced dark spots.

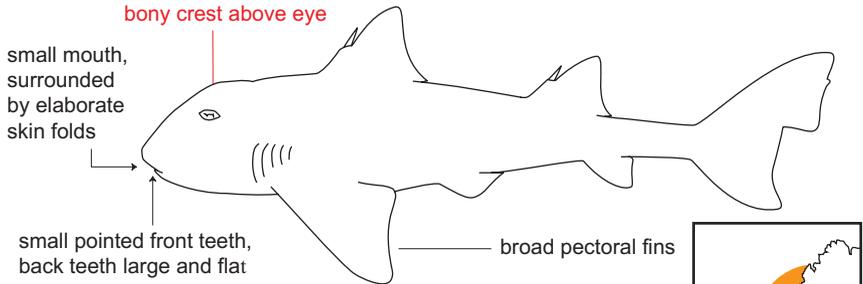
Grey carpet shark: Grey colouration; first dorsal fin over rear of pelvic fins.

Speckled carpet shark: Yellowish colouration; large back spot above pectoral fin with many fine dark spots over pale banding.



1.4.4 Horn sharks (family Heterodontidae)

Small to medium-sized, bottom-dwelling sharks, characterised by large, blunt heads and spines on both dorsal fins. 2 species in W.A. Coastal distribution and generally found on or near the bottom. Brown, grey or pale colouration with darker stripes or bars. To about 120cm.



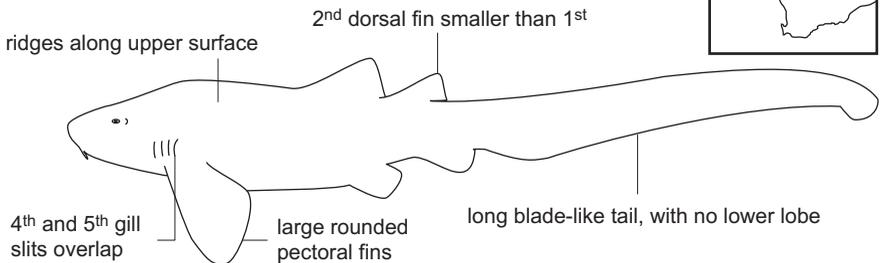
Significant species in WA:

Port Jackson shark: Grey-brown with dark diagonal stripes.

Zebra Horn Shark: Dark vertical bands on a pale background.

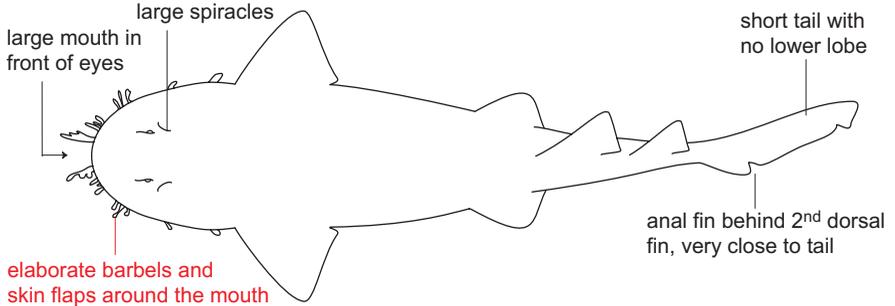
1.4.5 Zebra shark (family Stegastomatidae)

Medium sized shark with a broad head, blunt snout and small mouth. 1 species in W.A. Inhabits continental shelf waters, close to the bottom. Sandy to yellow-brown with numerous brown spots; juveniles dark with white bars and spots. Born 20cm, reaching 235cm.



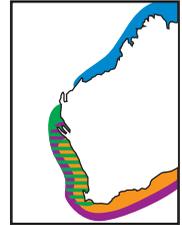
1.4.6 Wobbegongs (family Orectolobidae)

Small to large sharks with flattened bodies, numerous nasal barbels and elaborate colouration. 6 species in W.A. Inhabit coastal waters where they are usually found on the bottom. Dark brown to yellowish brown with various patterns of spots, blotches and saddles. From 20cm to 300cm.



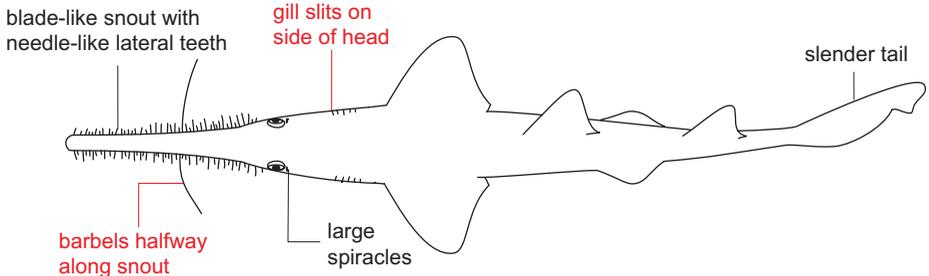
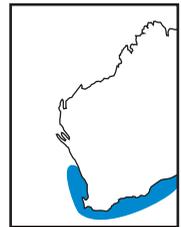
Significant species in WA:

- Banded:** Large; elaborately patterned; light spots with black outlines.
- Cobbler:** Distinct warty lumps on dorsal surface.
- Spotted:** Large; elaborately patterned; spots with white outlines.
- Tasselled:** Tassled barbels and mosaic pattern of small spots.
- Western:** Simple, unbranched barbels. No light spots.



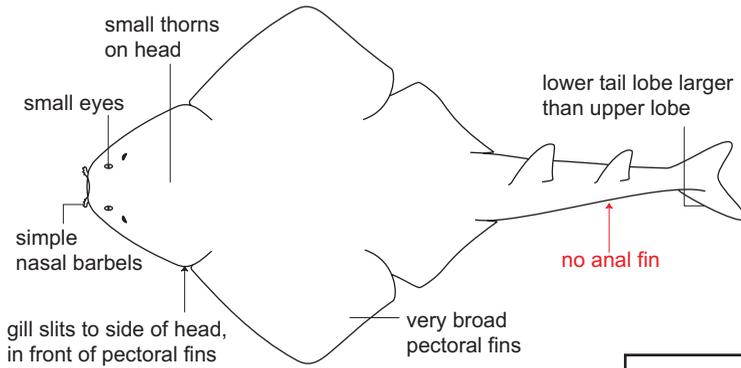
1.4.7 Sawsharks (family Pristiophoridae)

A family of small sharks which look similar to sawfishes (rays) but which can easily be distinguished by having gill slits on the side of the head and long, thin barbels on the snout. 1 species in W.A. Sawsharks have long, slightly flattened bodies and very long, slender snouts, armed with sharp teeth. Live on or near the bottom in coastal waters. Generally sandy coloured with brown spots and blotches. From 38cm to 134cm.



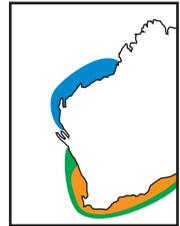
1.4.8 Angel sharks (family Squatinidae)

Medium sized sharks with flattened heads and bodies. 3 species in W.A. Found in continental shelf waters on the bottom. Yellow-brown to brown-grey dorsal surface with blue or white spots, or brown blotches. To 150cm.



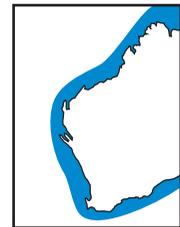
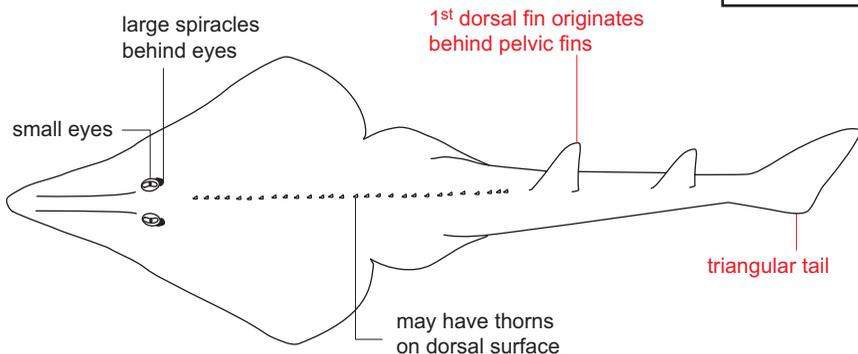
Significant species in WA:

- Australian:** Dark spots on tail and no thorns near eyes.
- Ornate:** 3 pairs of ringed eye-like spots at bases of pectoral and pelvic fins.
- Western:** Blue spots, thorns near eyes and single row along trunk.



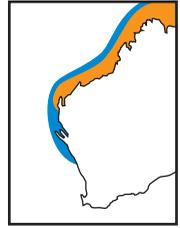
1.4.9 Shovelnose rays (family Rhinobatidae)

Rays with shark-like bodies and triangular heads. Shovelnose rays can be distinguished from the similar looking white spotted guitarfish by their 1st dorsal fin being well **behind** the pelvic fins and their **triangular tail**. 4 species in W.A. Found on the bottom in continental shelf waters. Usually yellow to grey-brown in colour. Some species with dark blotches or light bands. To 270cm.

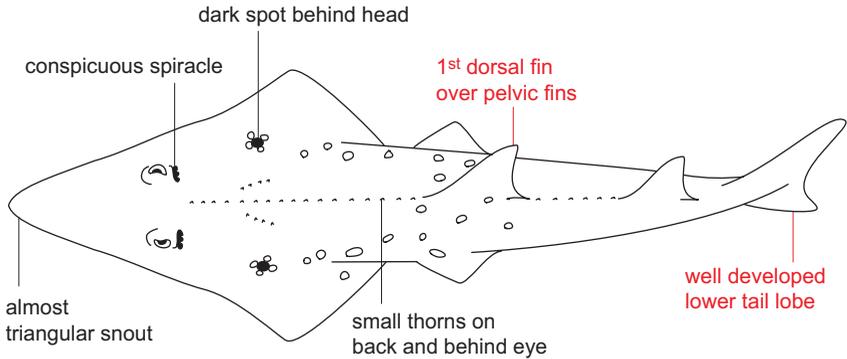


1.4.10 Guitarfish (family Rhynchobatidae)

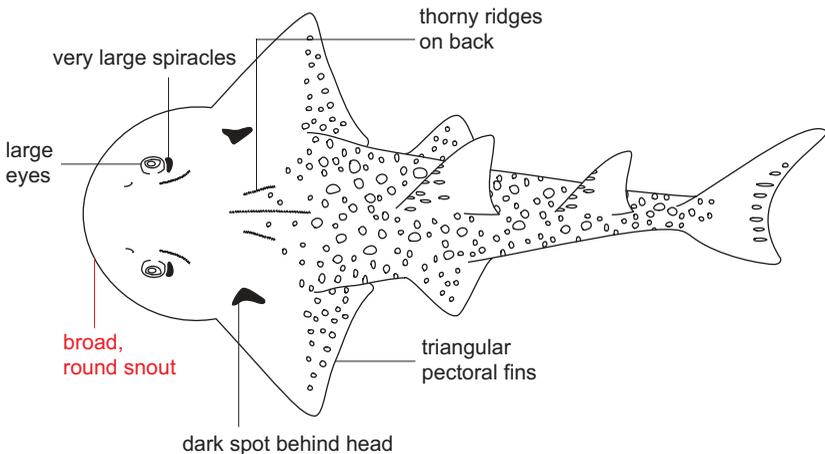
Shark-like rays with pectoral fins and head distinct from each other. 2 large dorsal fins. The white spotted guitarfish can be distinguished from the similar-looking shovelnose rays by its **1st dorsal fin being over the pelvic fin and having a distinct lower tail lobe**. 2 species in W.A. Occurs on the bottom of continental shelf waters. Sandy colour with white spots (white spotted guitarfish) blue/grey with many white spots (shark ray). To 300cm. Both Australian species are illustrated below.



White Spotted Guitarfish (white spotted shovelnose ray):

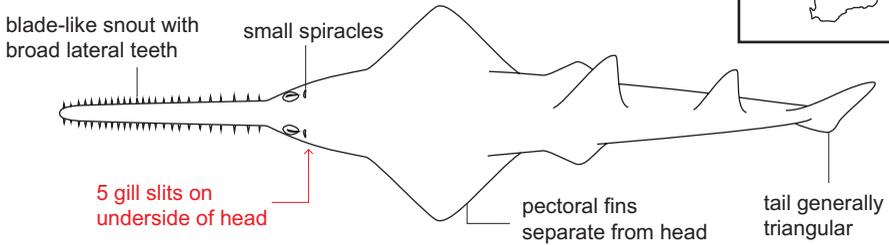


Shark Ray:



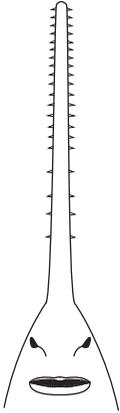
1.4.11 Sawfish (family Pristidae)

Large rays, with a similar shark-like body shape to sawsharks but which can be distinguished by having **gill slits on the underside of the head** and **no barbels on snout**. 4 species in W.A. Coastal, estuarine and freshwater distribution; found on the bottom. Yellow, grey, green or brown dorsally and pale below. To 700cm.



Significant species in WA:

Narrow Sawfish

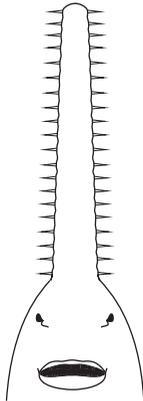


Slender rostrum with 18-22 pairs of teeth beginning some distance from head.

Distinct lower lobe on tail.

Greyish colour.

Dwarf Sawfish

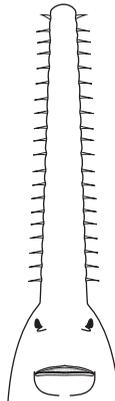


18-22 pairs of teeth, extending to snout. Teeth almost equally spaced. Broad head.

1st dorsal fin begins slightly behind pelvic fins.

Green/brown colour.

Freshwater Sawfish

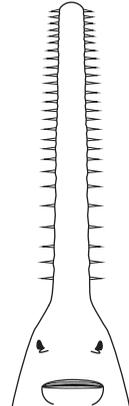


18-23 pairs of teeth extending to snout. Teeth equally spaced.

1st dorsal fin begins in front of pelvic fins. Distinct lower lobe on tail.

Yellowish colour.

Green Sawfish



24-34 pairs of teeth extending to snout; spaced further apart near base.

1st dorsal fin begins behind pelvic fin.

Olive green colour.

SECTION 2

WHALER SHARKS (family Carcharhinidae)

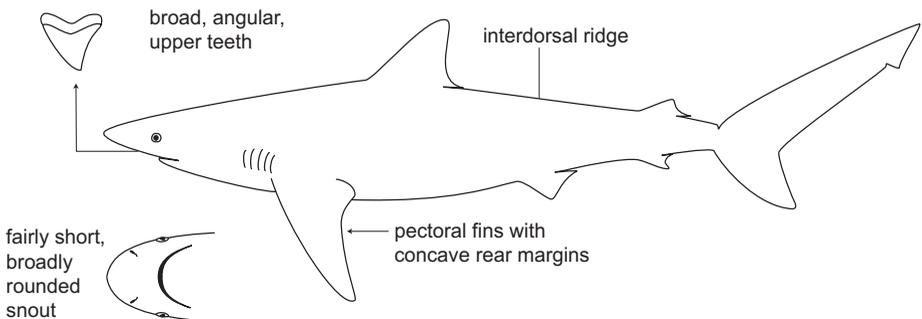
Sharks from this large family (27 species in WA) are relatively common in WA waters and consequently are caught by a number of different fishing methods.

This family generally exhibits typically shark-like characteristics: a fusiform body-shape; bronze-grey dorsal colouration; pale ventral colouration; large 1st and smaller 2nd dorsal fins; asymmetrical tail; lack of nasal barbels and precaudal pits on both dorsal and ventral surfaces.

Because many of these species look very similar, identification is often difficult. Identification is further complicated by each species commonly being known by several, usually descriptive, names, (e.g. 'blacktip', 'bronzey'). In this section, species are grouped according to their general appearance, so that similar- looking species appear together for easy comparison.

In addition to a general description, illustration and range for each species, we have also illustrated the ventral view of the head and a tooth from the front of the upper jaw. We hope that this extra information will be sufficient to differentiate even very similar-looking species.

2.1 Dusky shark (*Carcharhinus obscurus*)

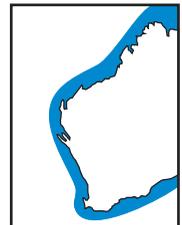


Continental shelf; from surf zone to oceanic waters, up to 400m depth.

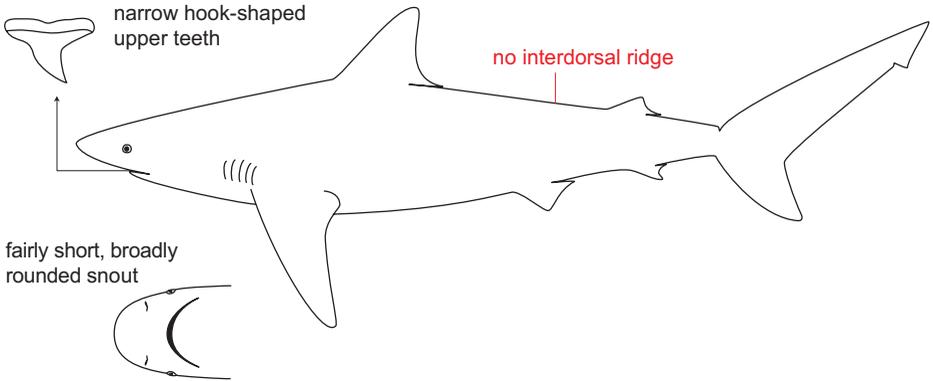
Bronze-grey to dark grey on dorsal surfaces, pale ventrally.

Dusky tips on most fins, particularly on lower lobe of tail and ventral surfaces of pectoral fins (darker in juveniles).

Born 70-100cm; to 365cm.



2.2 Bronze whaler (*Carcharhinus brachyurus*)



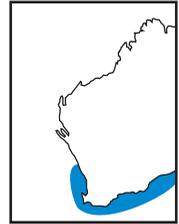
Similar to dusky whaler but **lacks interdorsal ridge**.

Inshore to offshore distribution; surf zone to at least 100m depth.

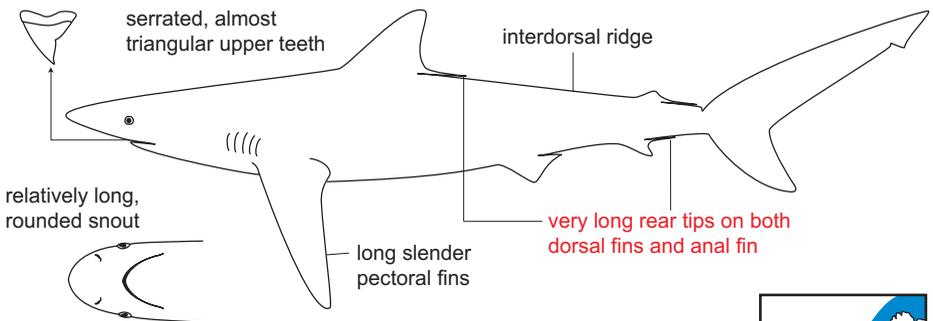
Bronze to grey dorsal colour, ventral surfaces creamy white.
Pale stripe forward along flank.

Dusky tips on most fins.

Born 60-70cm; to 295cm.



2.3 Silky shark (*Carcharhinus falciformis*)



Continental shelf; close inshore to well offshore; to 800m depth.

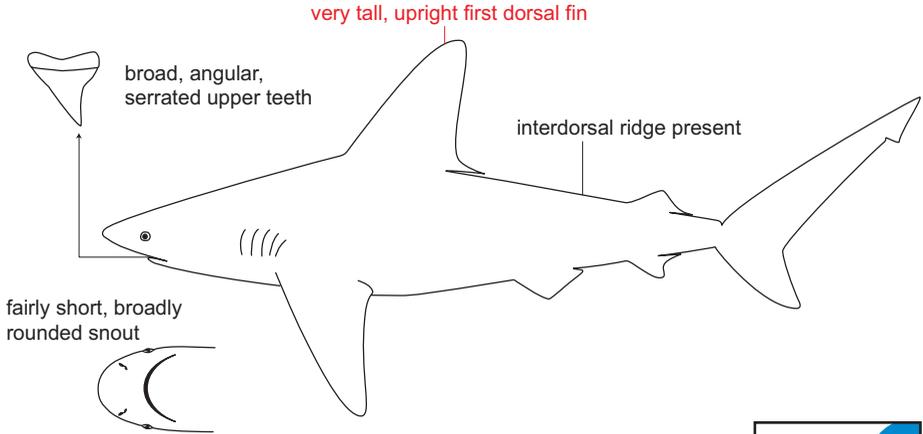
Dark brown to grey colour dorsally, paler ventrally.

Usually dusky tips on pectoral fins, 2nd dorsal fin and anal fin.

Born 70cm; to 330cm.



2.4 Sandbar (thickskin) shark (*Carcharhinus plumbeus*)

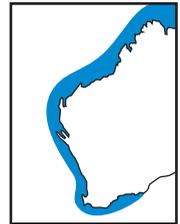


Intertidal to deep water adjacent to continental shelf; to 280m depth.

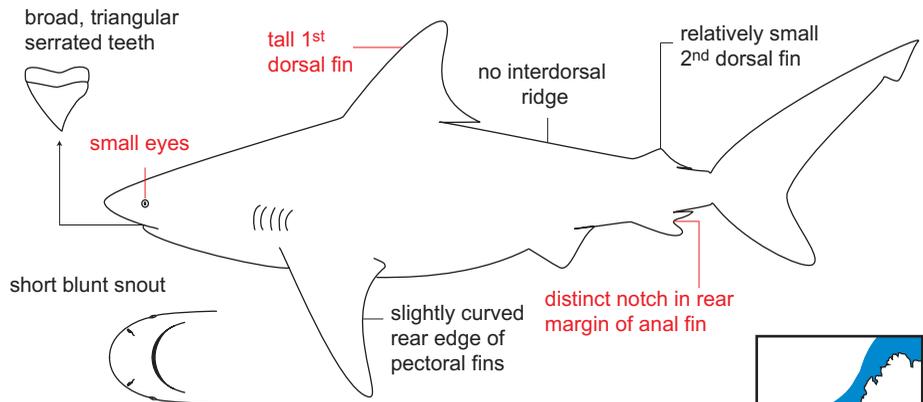
No distinctive fin markings.

Pale bronze to grey above, pale ventrally (often has parasitic scribble marks over body).

Born 55cm; to 240cm.



2.5 Pigeye shark (*Carcharhinus amboinensis*)

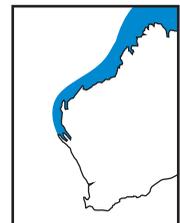


Very stout body, grey above, pale ventrally.

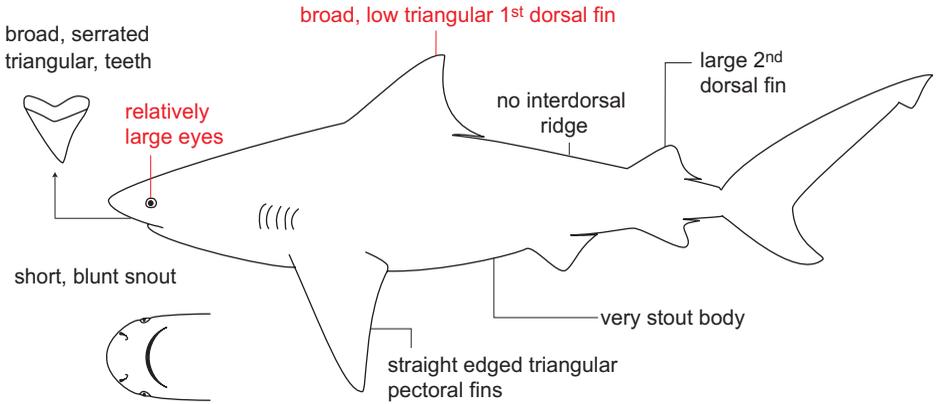
Close inshore, near surf-line and along beach; to 100m depth.

Flank with indistinct pale stripe from pelvic fins forward.

No fin markings. Born 60-65cm; to 280cm.



2.6 Bull shark (*Carcharhinus leucas*)

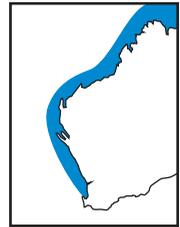


Similar to Pigeye but can be distinguished by more broadly triangular dorsal and pectoral fins, larger 2nd dorsal fin, larger eyes and no distinct notch in anal fin.

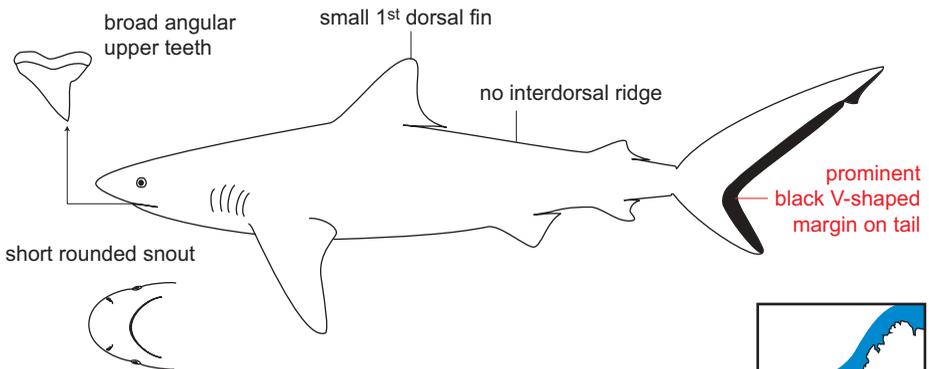
Inhabits estuaries, rivers (including Swan River) and coastal waters, inshore from surf zone to 150m depth.

Grey dorsally, pale ventrally. No distinctive fin markings.

Born 55cm; to 340cm.



2.7 Grey reef shark (*Carcharhinus amblyrhynchos*)

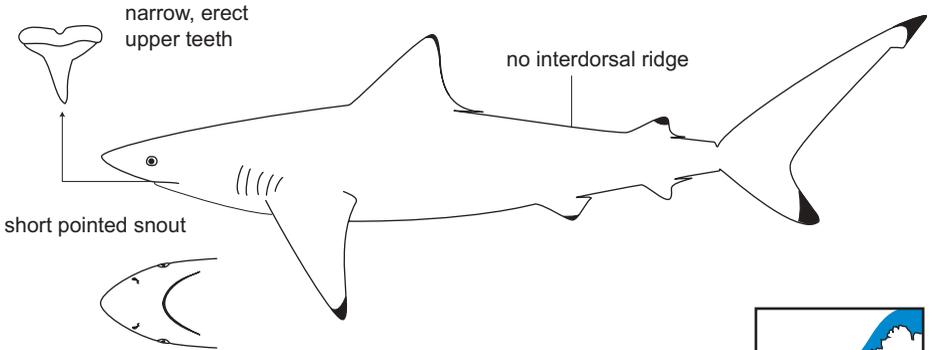


Continental shelf, nearshore to 280m depth. Commonly inhabit coral reefs.

Grey or greyish bronze, pale ventrally. Sometimes have white edging on 1st dorsal fin, other fin tips usually dusky.



2.8 Blacktip shark (*Carcharhinus tilstoni* and *C. limbatus*)

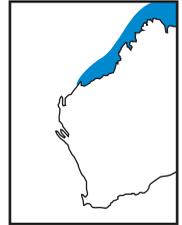


Continental shelf distribution, inshore to offshore (pelagic).

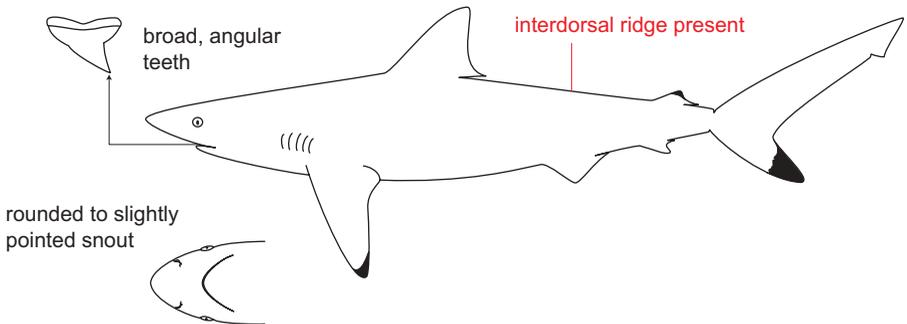
Greyish bronze, pale ventrally with pale stripe along flank.

All fins with black tips (less distinct in larger sharks, especially on 1st dorsal fin).

Born 60cm; to 200cm.



2.9 Spot-tail shark (*Carcharhinus sorrah*)



Shallow coastal and continental shelf waters; to 80m depth.

Bronze to greyish brown dorsally, white ventrally, with pale stripe on flank.

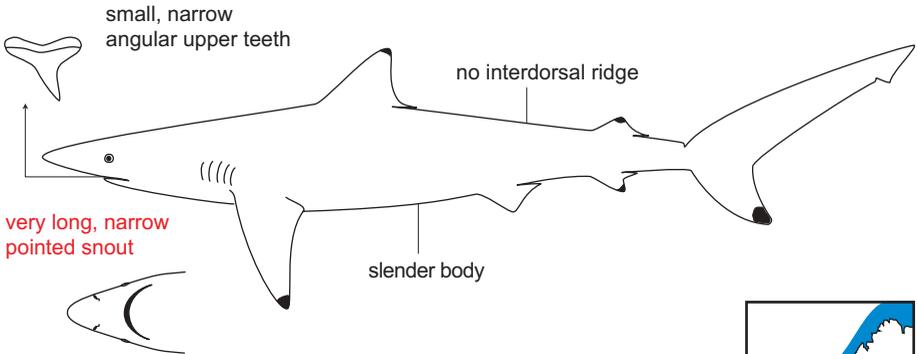
Distinct large black spot on lower tail.

Black tips also on pectoral fins and 2nd dorsal fin.

Born 50cm; to 160cm.



2.10 Spinner shark (*Carcharhinus brevipinna*)

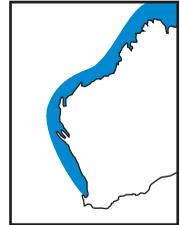


Continental shelf, inshore (<30m) and offshore to 75m depth.

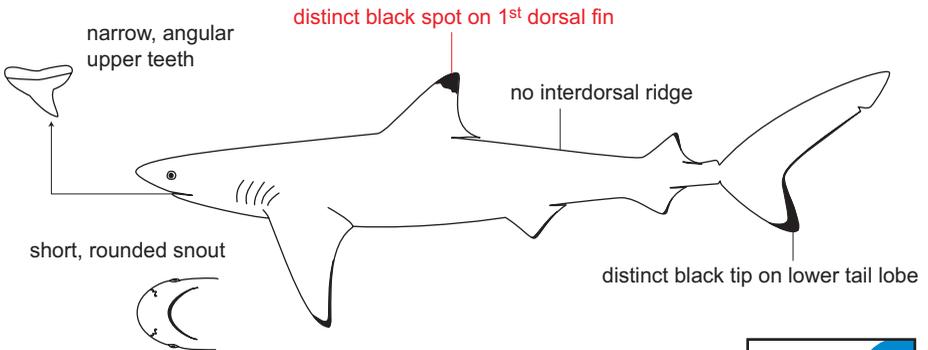
Bronze-grey dorsally, pale ventrally.

Black tips on all fins except pelvic fins (less distinct in small sharks).

Born 60cm; to 280cm.



2.11 Blacktip reef shark (*Carcharhinus melanopterus*)

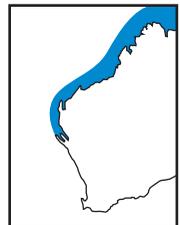


Shallow areas of continental shelf, close to coral reefs.

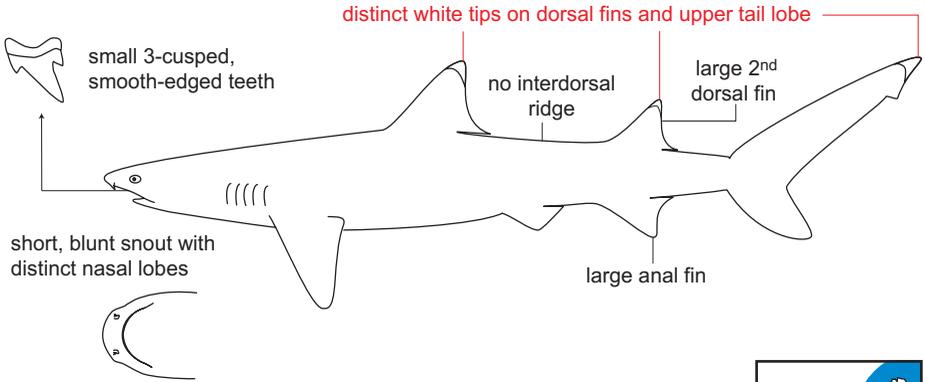
Yellowish brown to greyish brown with distinct pale stripe on flank.

Distinct black tips on 1st dorsal fin and lower tail (all sizes), usually less distinct black edging on all other fins.

Born 50cm; to 140cm.



2.12 Whitetip reef shark (*Triaenodon obesus*)



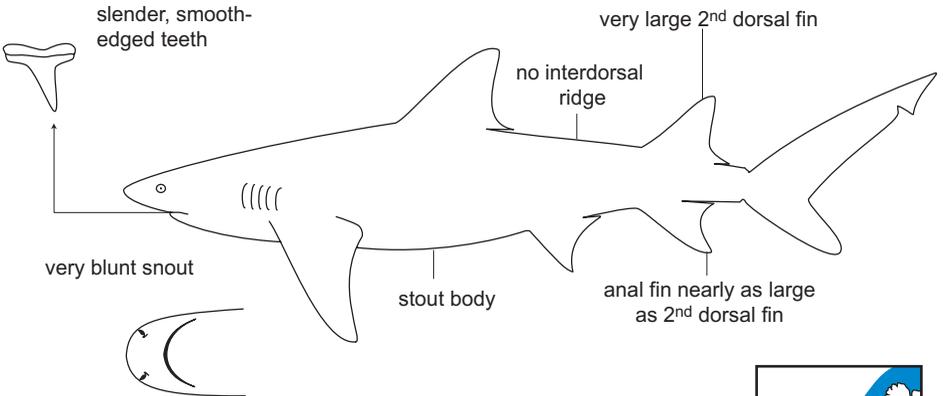
Shallow water from 8 to 40m depth.

Distinct white tips on dorsal fins and tip of tail.

Grey to brown dorsal surface, usually with a few dark spots, pale ventrally.

Born 52-60cm; to 170cm.

2.13 Lemon shark (*Negaprion acutidens*)



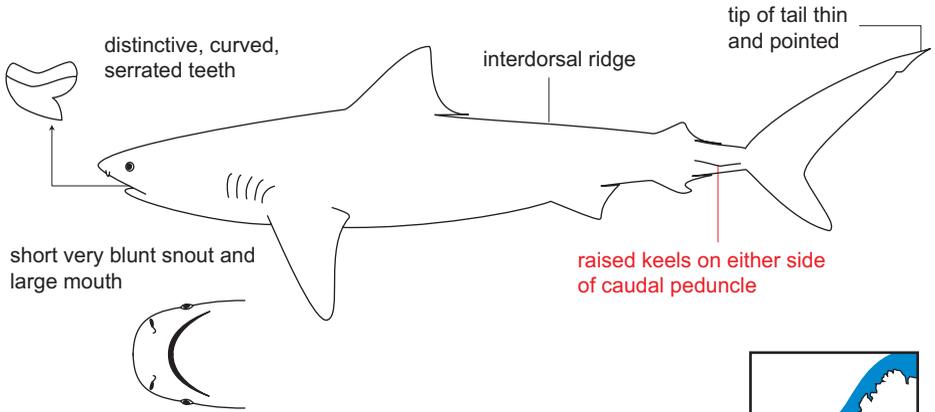
Continental shelf, from intertidal zone to 30m depth.

Pale yellow to light brown dorsal colour, white ventrally.

Fins lack markings, but all have noticeably concave rear margins.

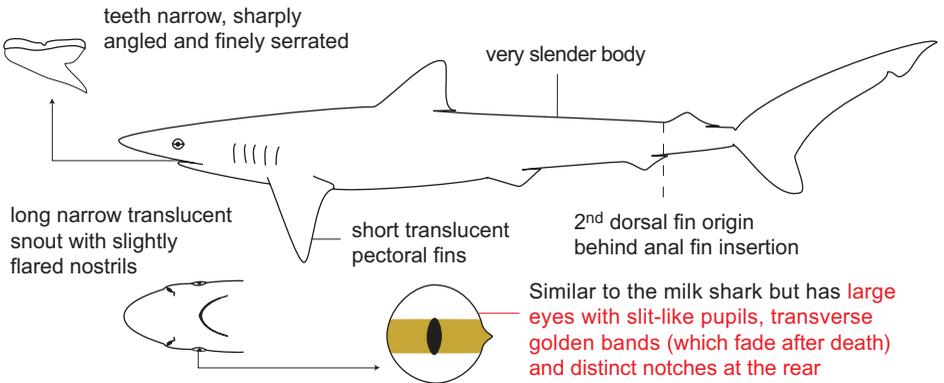
Born 50-70cm; to 300cm.

2.14 Tiger shark (*Galeocerdo cuvier*)



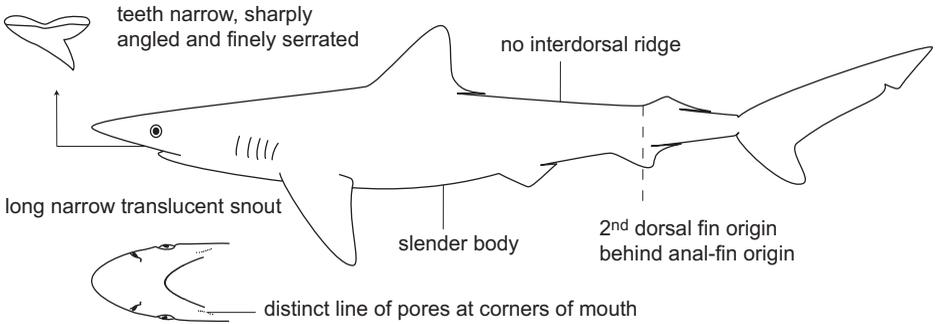
Continental shelf close inshore to deep offshore; to 150m depth.
 Grey to brown with dark vertical bands on flanks (faded in larger sharks) and white ventrally.
 Born 50-75cm; to 600cm.

2.15 Sliteye shark (*Loxodon macrorhinus*)

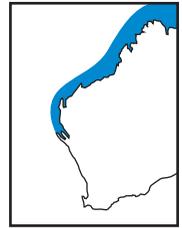


Continental shelf waters, to 100m depth.
 Dorsal surfaces bronze to grey; pale ventrally.
 Pale tips on pectoral fins, pelvic fins and lower tail, 1st dorsal fin and tail sometimes dark-edged.
 Born 40-45cm; to 90cm.

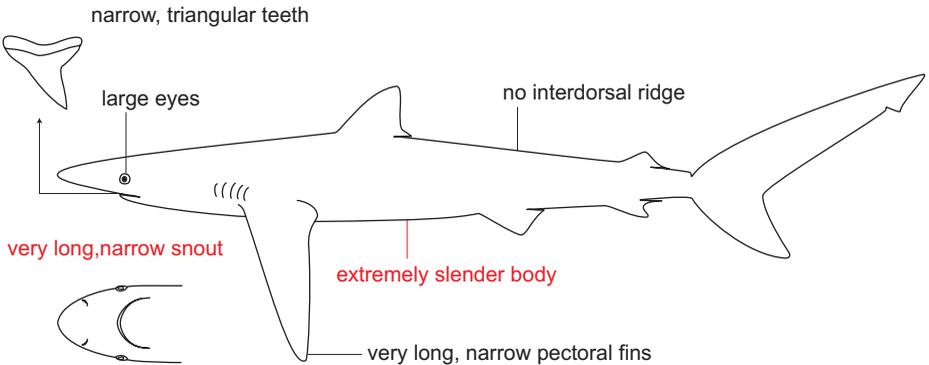
2.16 Milk shark (*Rhizoprionodon acutus*)



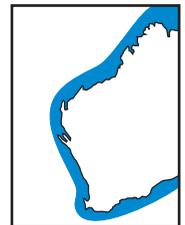
Similar to the slit-eye shark but **lacks its distinctive eye** (see below).
 Inhabits continental shelf waters close inshore, (1m) to 200m depth.
 Bronze to greyish dorsal colouration, pale ventrally.
 Pale tips on pectoral fins, pelvic fins and lower tail.
 Born 35-40cm; to 100cm.



2.17 Blue shark (*Prionace glauca*)



Deep offshore waters, rarely found inshore, to 350m depth.
Bright indigo-blue on dorsal surfaces, white ventrally.
 Darker tips on pectoral fins.
 Born 35-50cm; to 385cm.



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