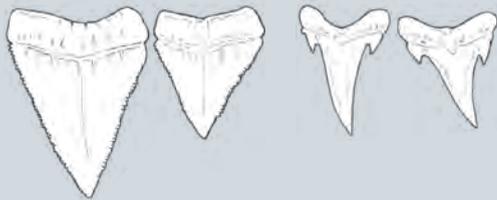


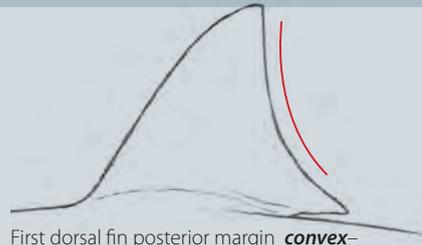
1a Upper teeth broadly triangular and serrated. First dorsal fin posterior margin convex → *Carcharodon carcharias*, p.47

1b Upper teeth long, narrow, and without serrations. First dorsal fin posterior margin concave → **2**

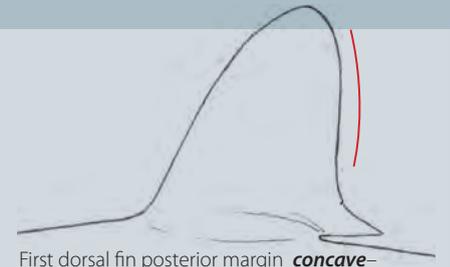


Upper teeth **broad, triangular & serrated**– *C. carcharias*, p.47

Upper teeth **long & narrow**– Go to **2**



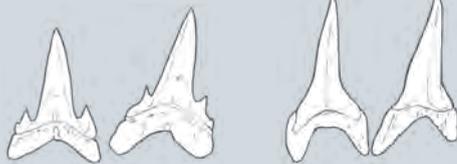
First dorsal fin posterior margin **convex**– *C. carcharias*, p.47



First dorsal fin posterior margin **concave**– Go to **2**

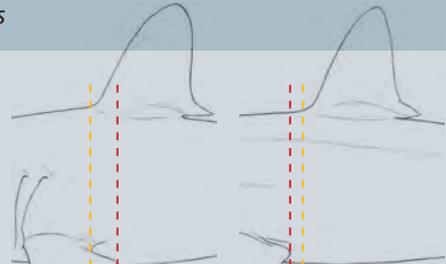
2a Origin of first dorsal fin over base or inner margin of pectoral fins. Caudal peduncle with two keels. Teeth with small lateral cusplets → *Lamna nasus* p.53

2b Origin of first dorsal fin posterior to rear tip of inner margin of pectoral fins. No secondary keel on caudal peduncle. Teeth without small lateral cusplets → **3, Isurus**



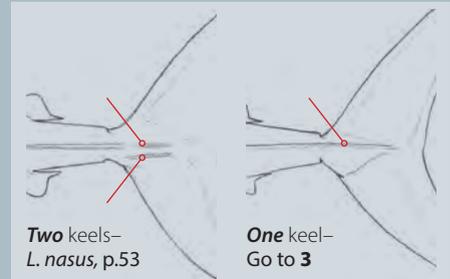
Teeth with **small lateral cusplets**– *L. nasus*, p.53

Teeth **without** small lateral cusplets– Go to **3**



Origin of first dorsal fin– *L. nasus*, p.53

Origin of first dorsal fin– Go to **3**

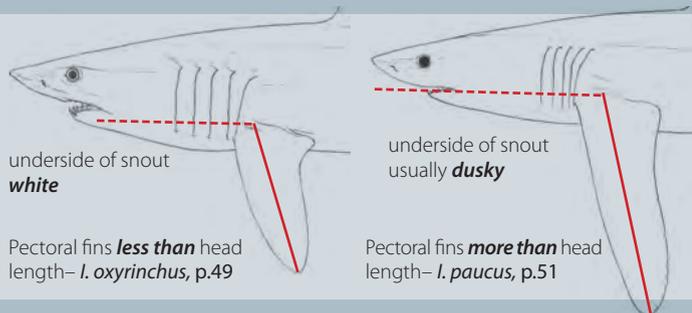


Two keels– *L. nasus*, p.53

One keel– Go to **3**

3a Pectoral fins length considerably less than head length. Anal fin origin under midbase of second dorsal fin → *Isurus oxyrinchus*, p.49

3b Pectoral fins length equal to or greater than head length. Anal fin origin slightly behind second dorsal fin insertion → *Isurus paucus*, p.51

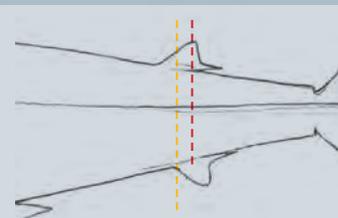


underside of snout **white**

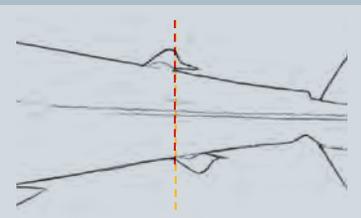
Pectoral fins **less than** head length– *I. oxyrinchus*, p.49

underside of snout usually **dusky**

Pectoral fins **more than** head length– *I. paucus*, p.51



Anal fin origin under **midbase** of second dorsal– *I. oxyrinchus*, p.49

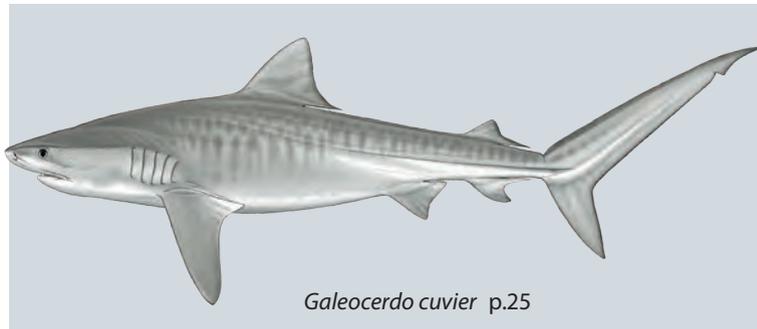


Anal fin origin slightly **behind** second dorsal insertion– *I. paucus*, p.51

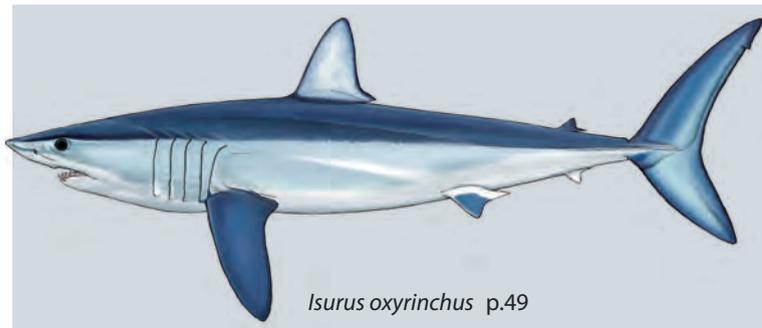
Lamnidae species comparison and look alikes



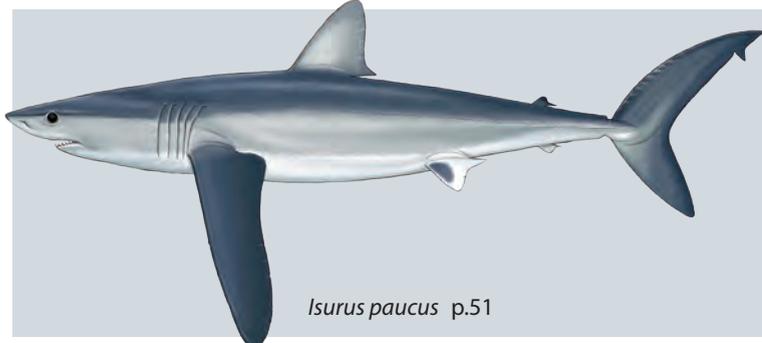
Carcharodon carcharias p.47



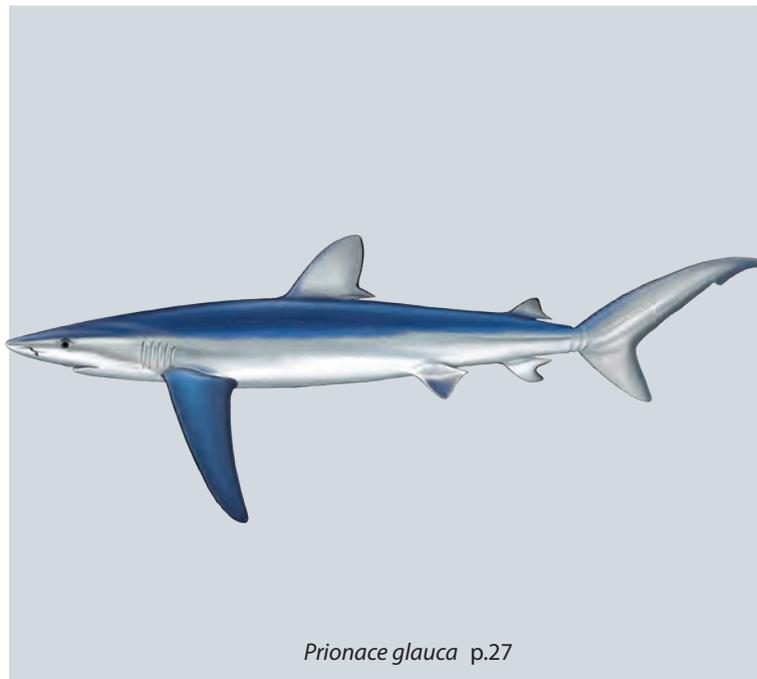
Galeocerdo cuvier p.25



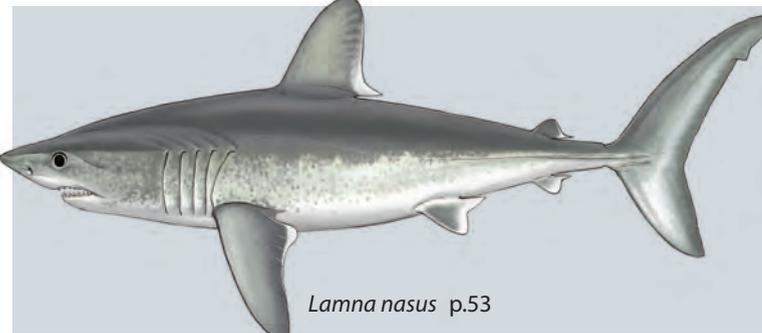
Isurus oxyrinchus p.49



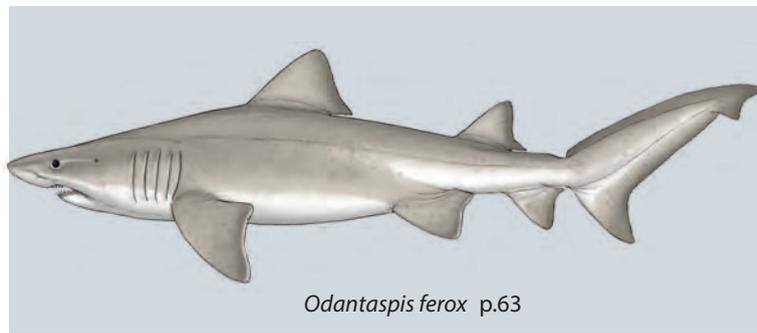
Isurus paucus p.51



Prionace glauca p.27



Lamna nasus p.53



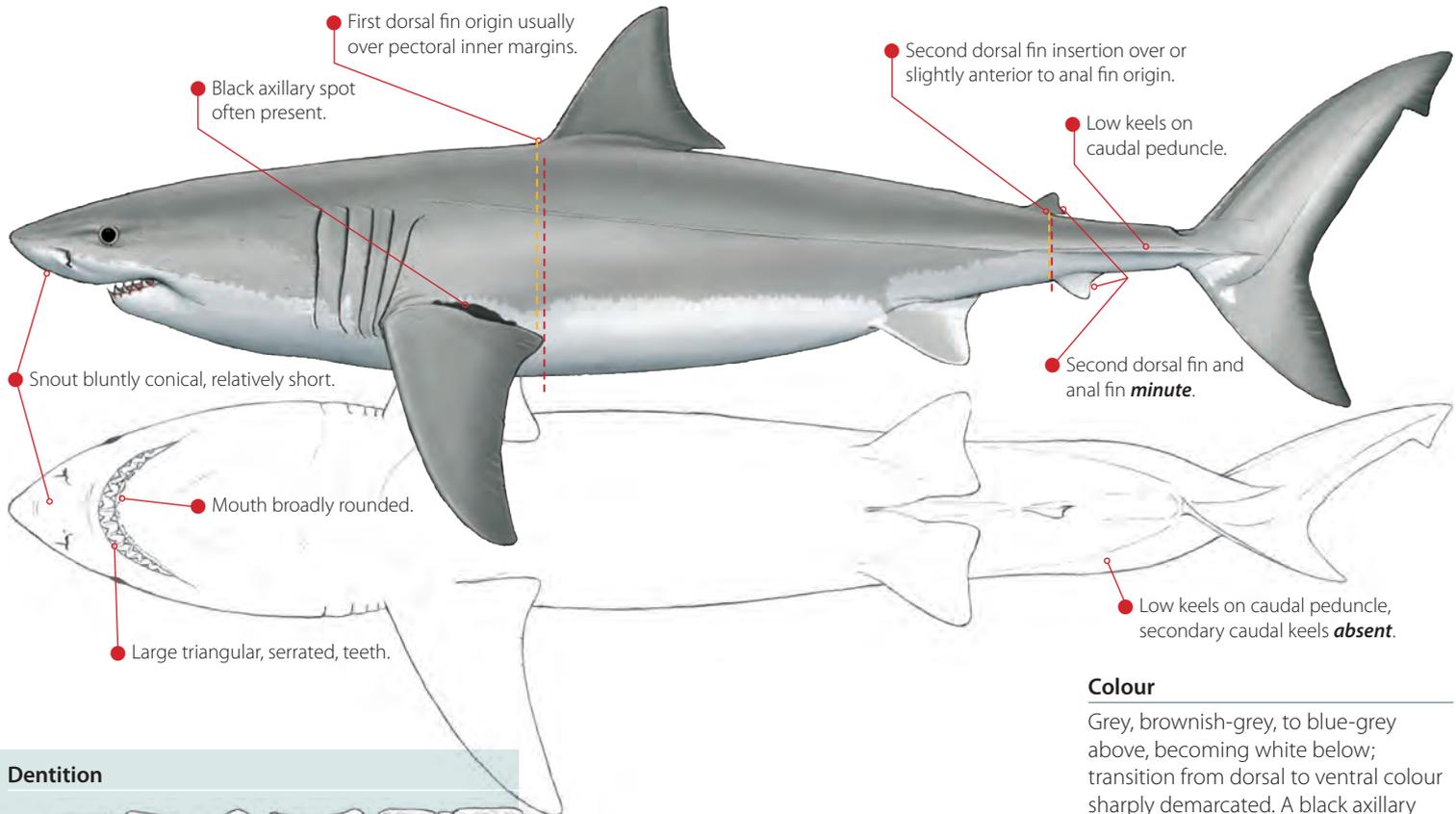
Odontaspis ferox p.63

Carcharodon carcharias
(Linnaeus, 1758)

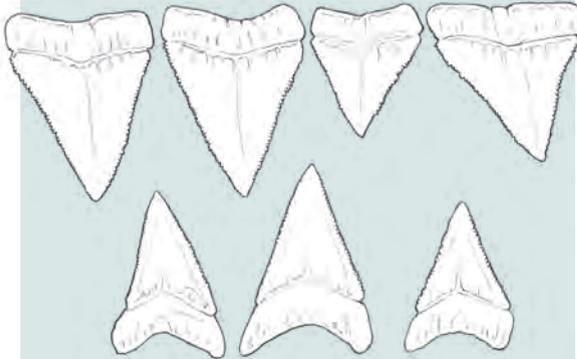
White Shark
Grand Requin Blanc

VU

LL



Dentition



Teeth approximately actual size.

Teeth very large, erect, subtriangular, with edges coarsely serrated; similar in both jaws except lowers more slender than uppers.

Tooth counts: upper jaw 23–29, lower jaw 21–25.

Description

A stout spindle-shaped body, with a conical snout, a large erect, triangular first dorsal fin, minute second dorsal and anal fins, no secondary caudal keel, and a large crescent-shaped caudal fin.



© NOAA Fisheries, USA

Colour

Grey, brownish-grey, to blue-grey above, becoming white below; transition from dorsal to ventral colour sharply demarcated. A black axillary spot often at pectoral fins insertion; pectoral fin tips usually abruptly black on their ventral surfaces. Eyes are a conspicuous black.

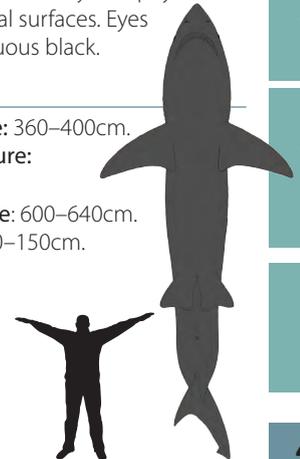
Size

Males mature: 360–400cm.

Females mature: 450–500cm.

Maximum size: 600–640cm.

Birth size: 120–150cm.

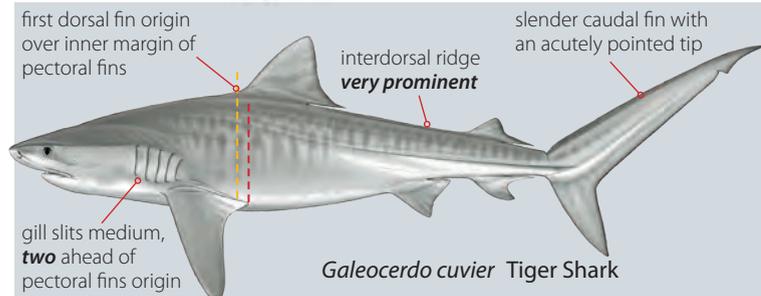
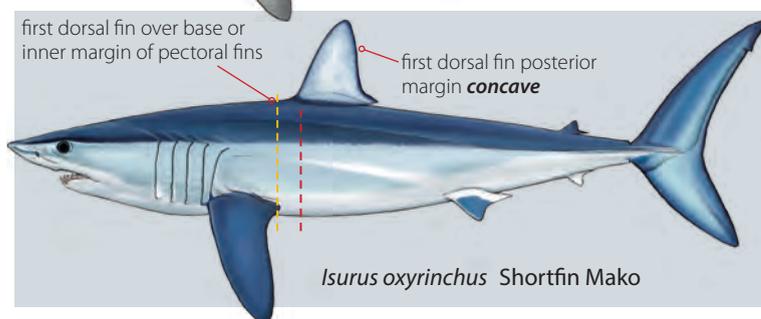
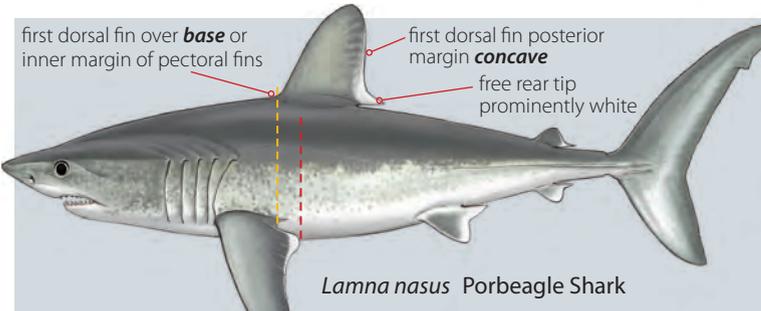
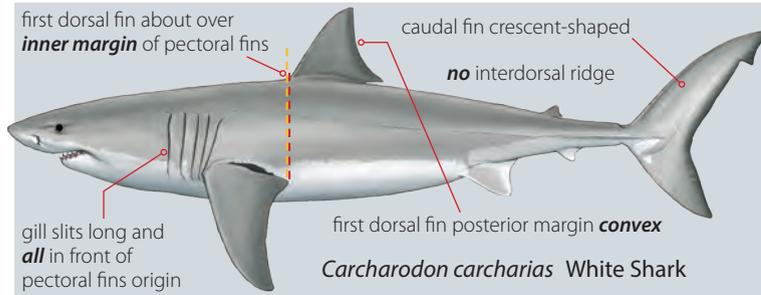


SIMILAR SPECIES

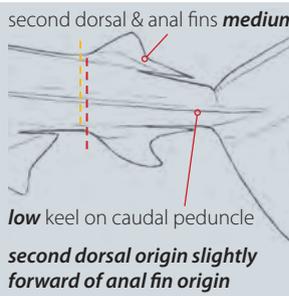
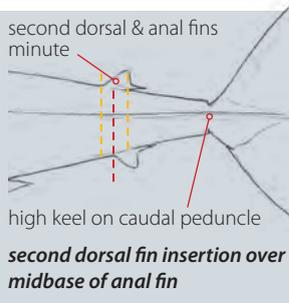
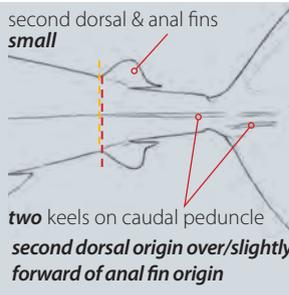
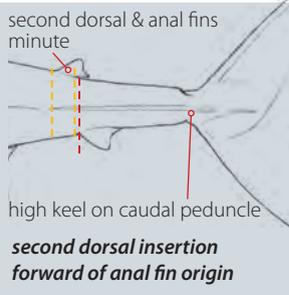
A relatively short conical snout; large erect first dorsal fin with convex posterior margin, one high keel either side of caudal peduncle; back and sides grey,

white below usually with a black axillary spot at pectoral fins insertion; large, coarsely serrated, triangular teeth.

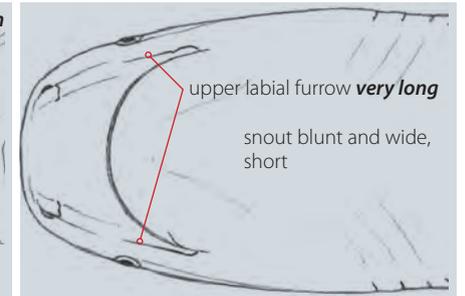
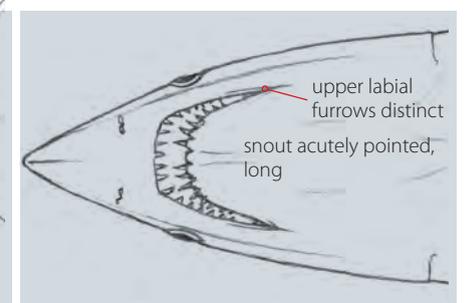
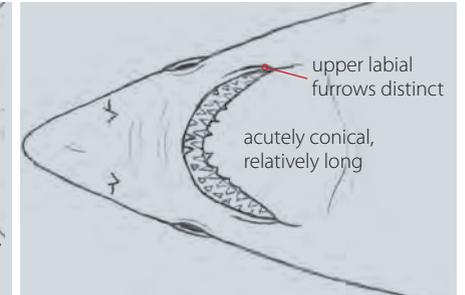
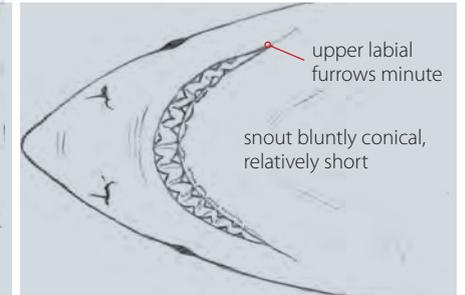
First dorsal and caudal fins, interdorsal and caudal



Second dorsal & anal fins



Ventral view of head



Isurus oxyrinchus

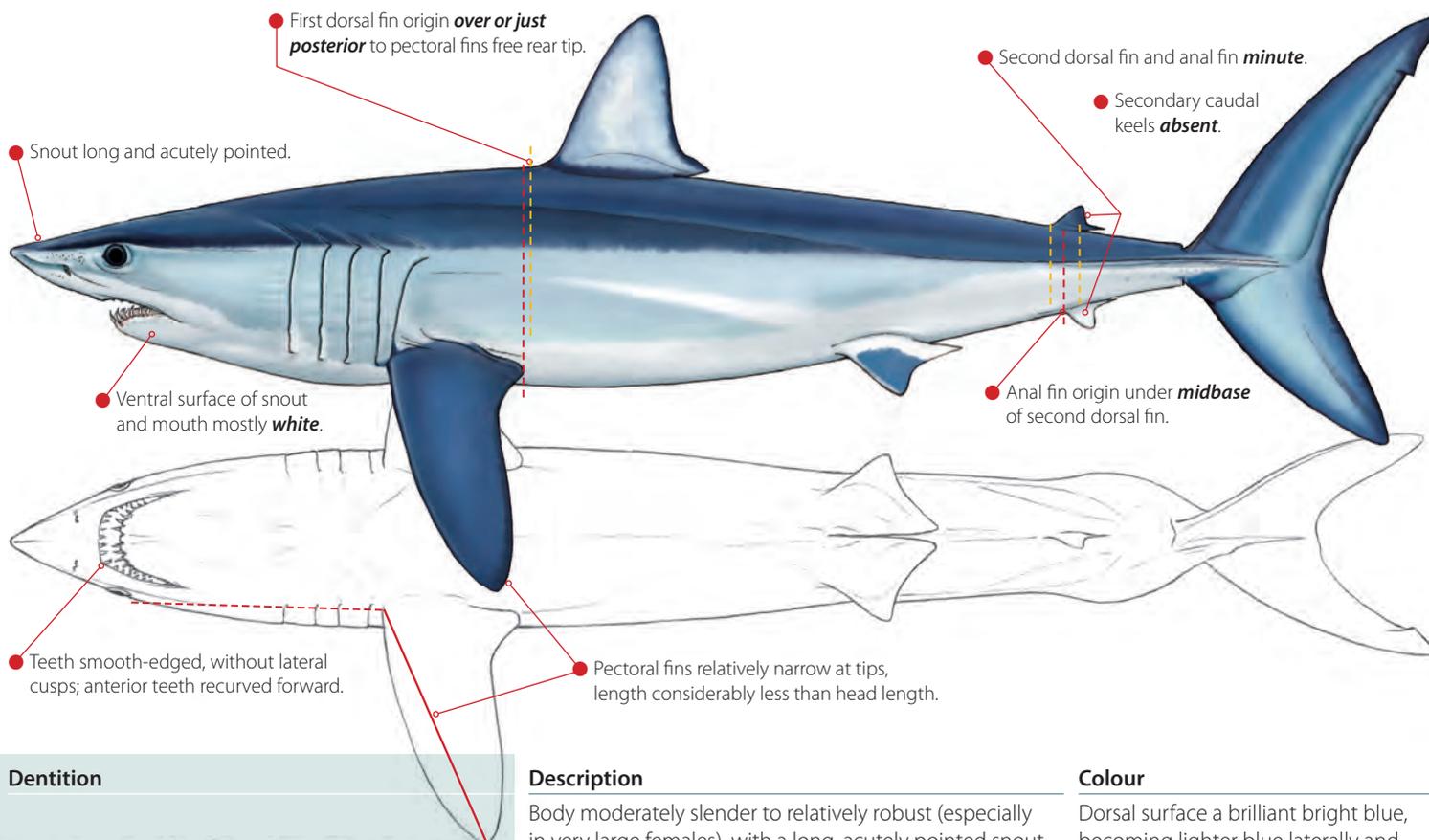
Rafinesque, 1810

Shortfin Mako Shark

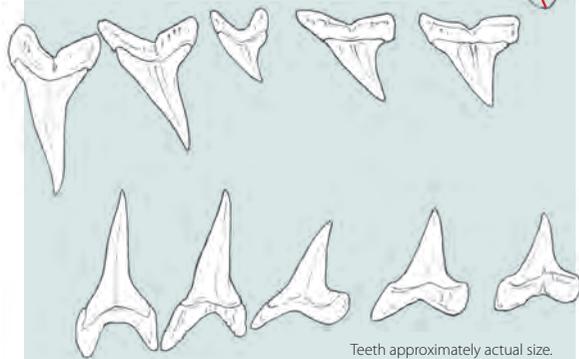
Taupe Bleue

VU

LL



Dentition



Teeth similar in both jaws, narrow, slender, **recurved** and more oblique.

Tooth counts: upper jaw 24–26, lower jaw 22–32.

Description

Body moderately slender to relatively robust (especially in very large females), with a long, acutely pointed snout, eyes less than 33% snout length, pectoral fins less than head length, a high, erect first dorsal fin, an anal fin originating under midbase of second dorsal fin, and a crescent-shaped caudal fin.



© Charlene Da Silva (Department Agriculture, Forestry, and Fisheries, South Africa)

Colour

Dorsal surface a brilliant bright blue, becoming lighter blue laterally and white on ventral surface; **ventral surface of snout usually white**.

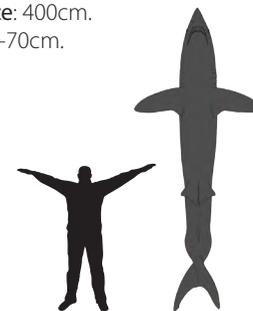
Size

Males mature: about 200.

Females mature: 270–300cm.

Maximum size: 400cm.

Birth size: 60–70cm.

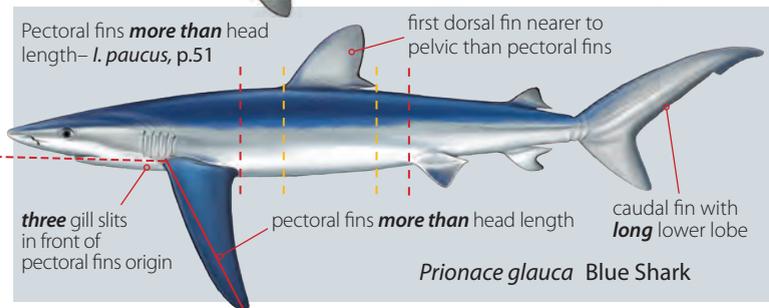
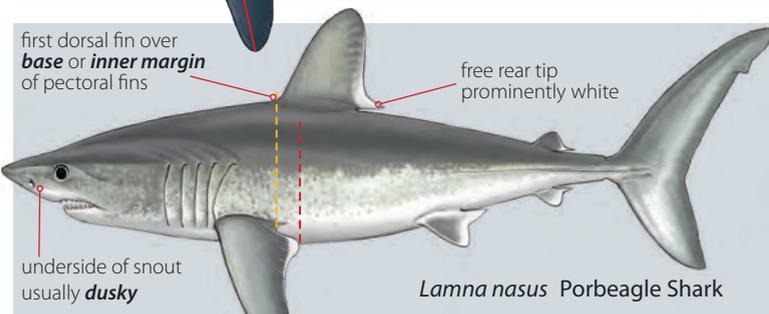
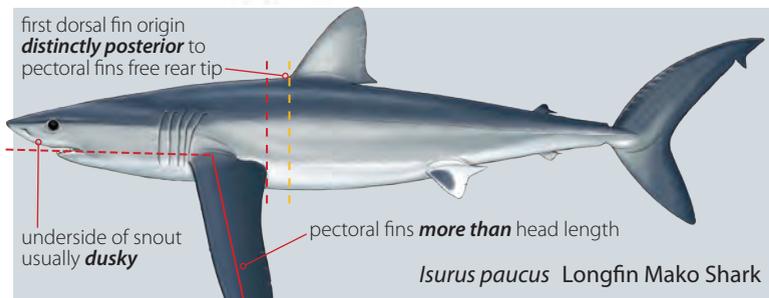
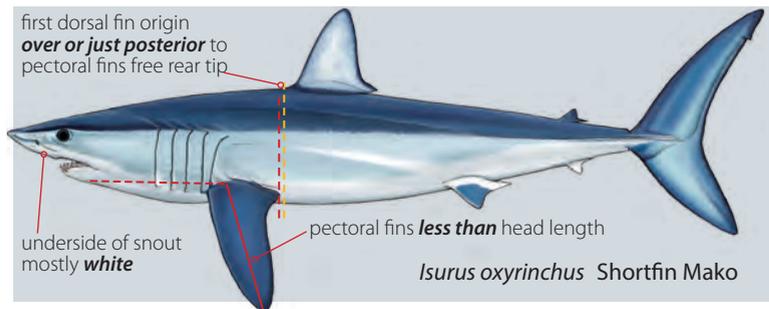


SIMILAR SPECIES

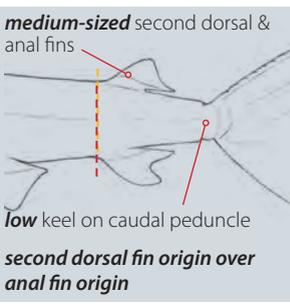
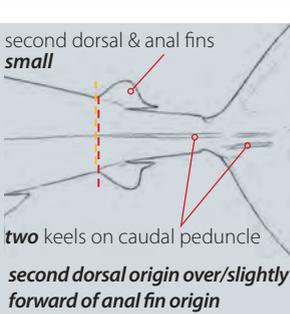
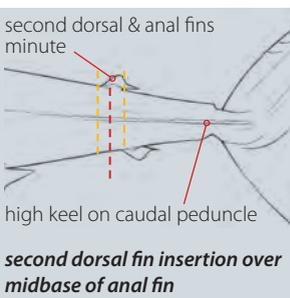
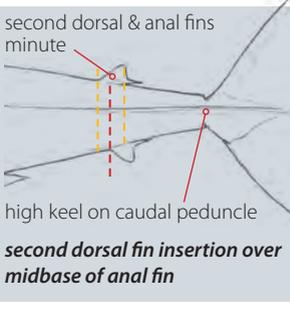
A relatively long pointed snout; pectoral fins moderately long, but less than head length, one high keel either side of the caudal peduncle; back and sides brilliantly blue, underside of snout usually white; long, smooth edged,

blade-like teeth which are recurved.

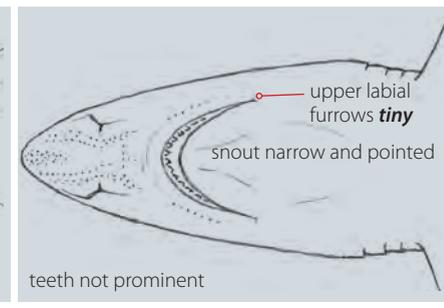
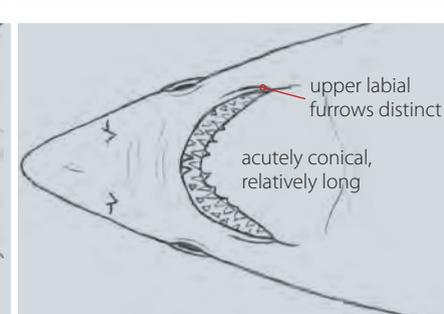
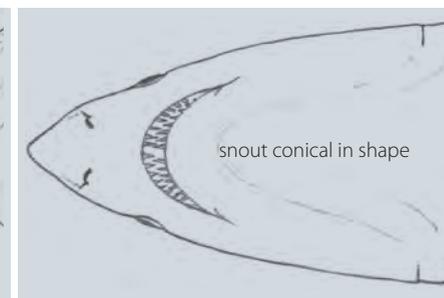
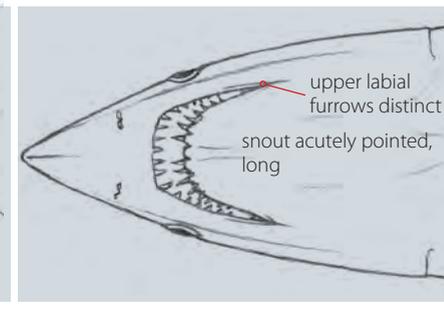
First dorsal and caudal fins, interdorsal and caudal



Second dorsal & anal fins



Ventral view of head



Isurus paucus

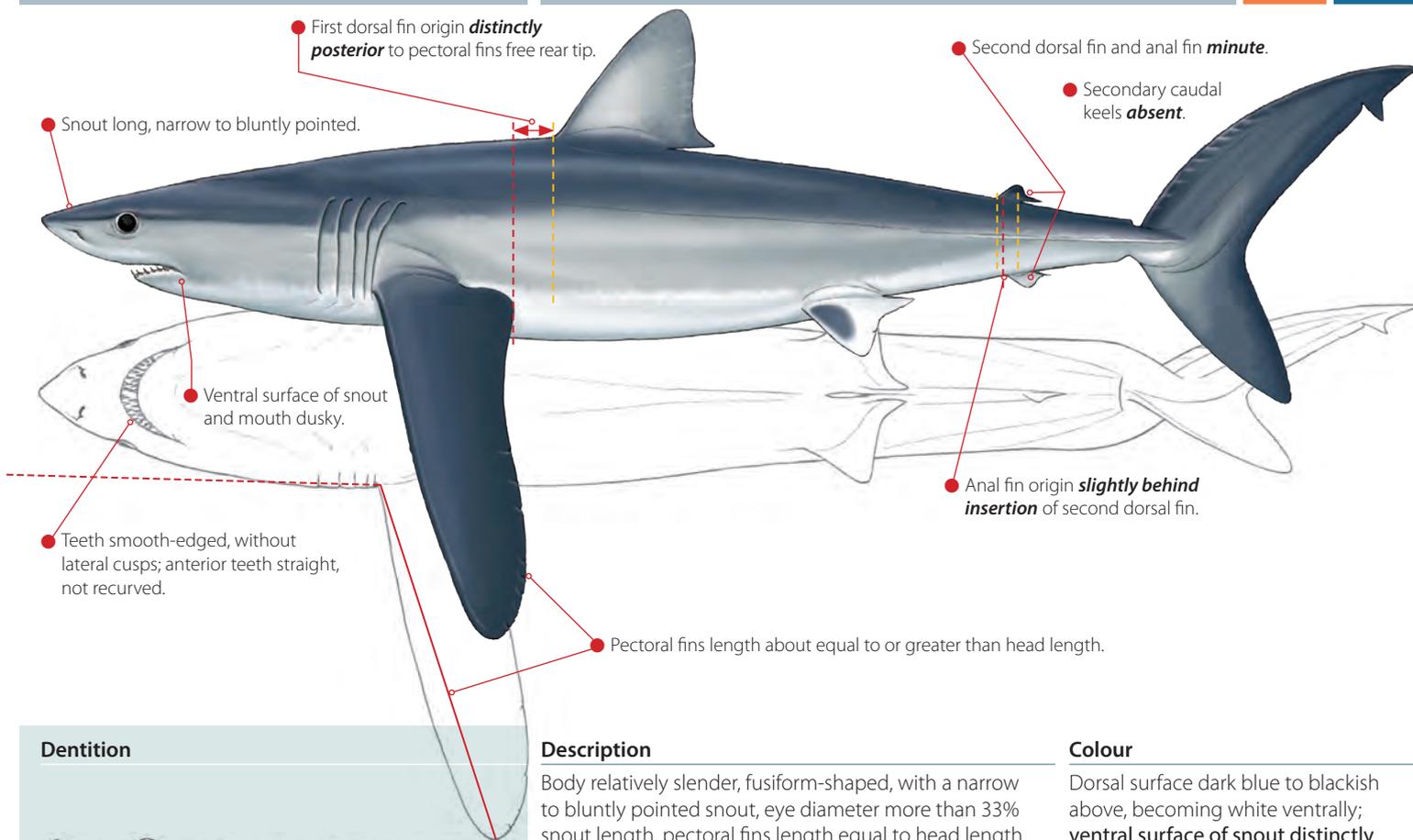
Guitart, 1966

Longfin Mako Shark

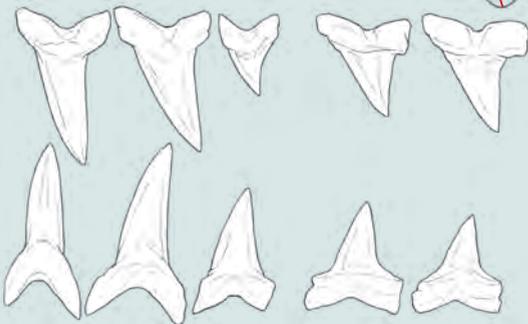
Petite Taupe

VU

LL



Dentition



Teeth approximately actual size.

Teeth similar in both jaws, broad, robust, **less recurved**, and less oblique.

Tooth counts: upper jaw 24–26, lower jaw 22–24.

Description

Body relatively slender, fusiform-shaped, with a narrow to bluntly pointed snout, eye diameter more than 33% snout length, pectoral fins length equal to head length, high, erect first dorsal fin, an anal fin originating slightly posterior to second dorsal fin insertion, and a crescent shaped caudal fin.



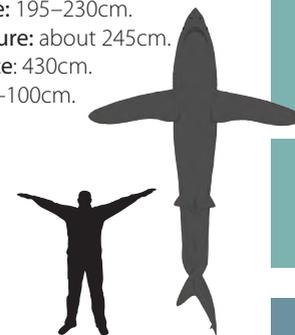
© NOAA Fisheries, USA

Colour

Dorsal surface dark blue to blackish above, becoming white ventrally; **ventral surface of snout distinctly dusky or dark**, except in small juveniles.

Size

Males mature: 195–230cm.
Females mature: about 245cm.
Maximum size: 430cm.
Birth size: 90–100cm.

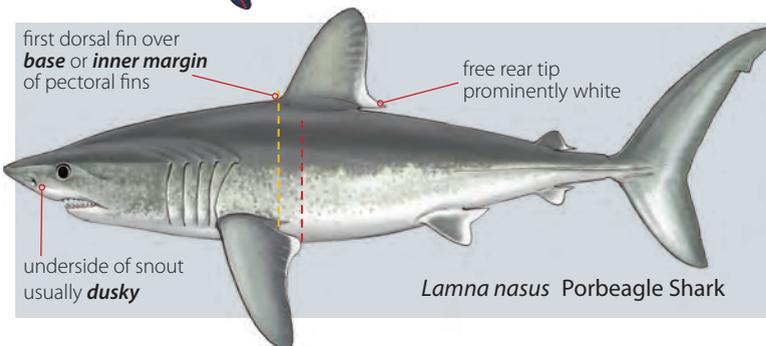
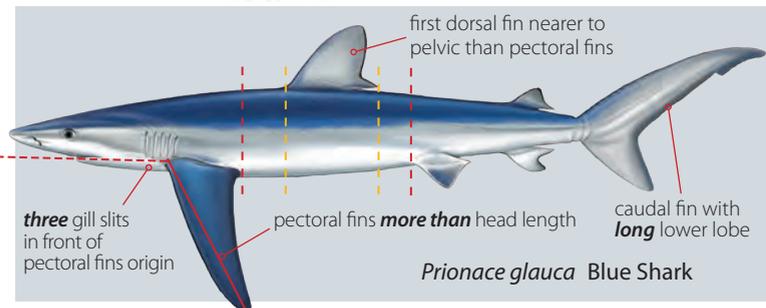
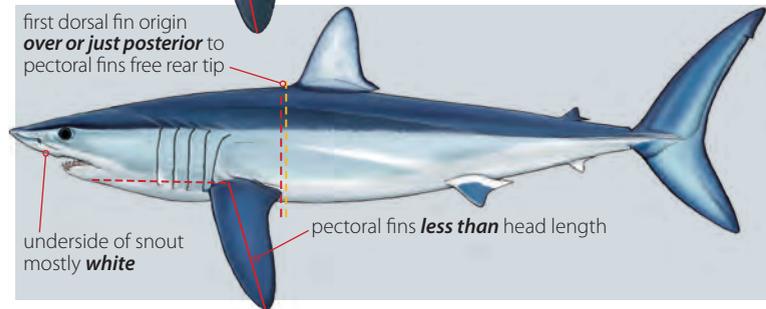
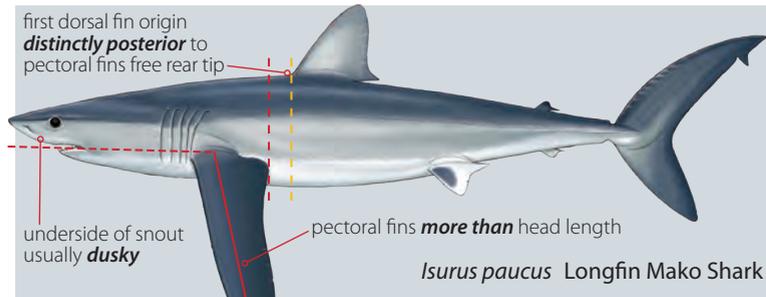


SIMILAR SPECIES

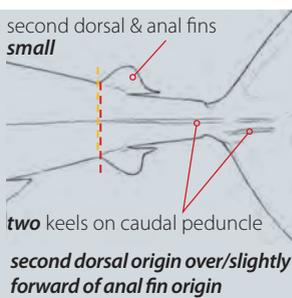
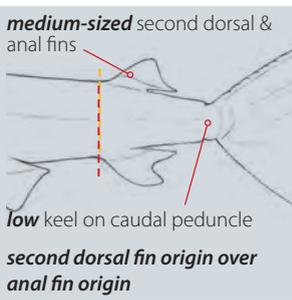
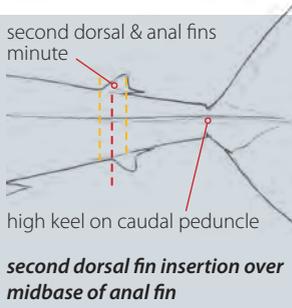
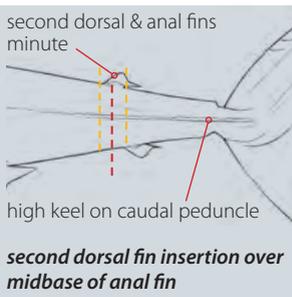
Snout is not as pointed as in Shortfin Mako; pectoral fins are very long and broadly tipped, length about equal to or longer than head length, one high keel either side of the caudal peduncle; back and sides greyish-black,

underside of snout dusky; teeth smooth-edged, blade-like, but not recurved.

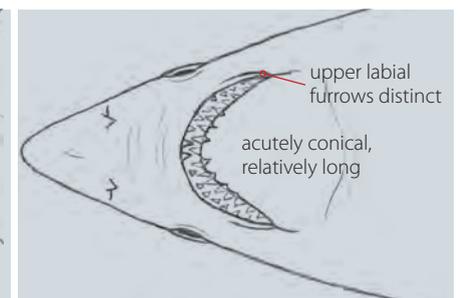
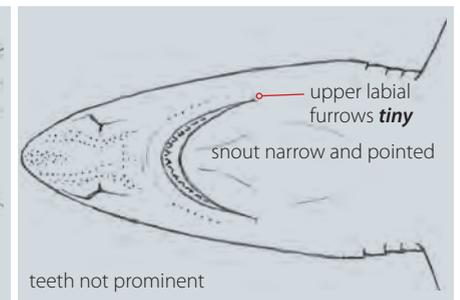
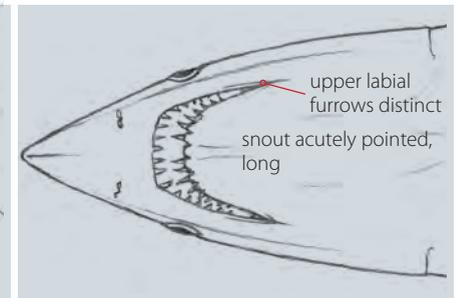
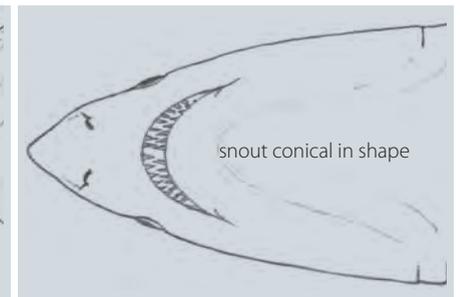
First dorsal and caudal fins, interdorsal and caudal



Second dorsal & anal fins



Ventral view of head

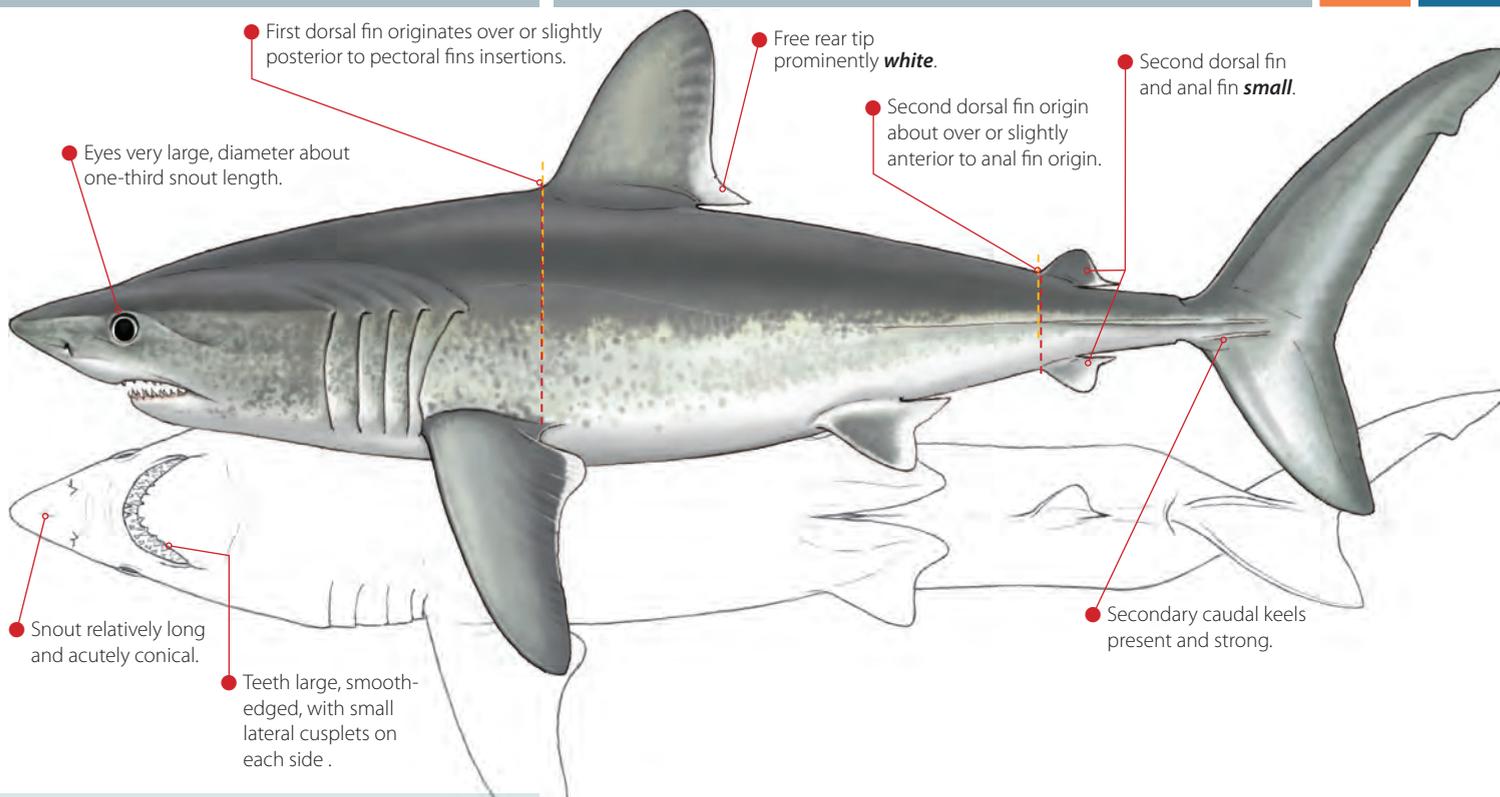


Lamna nasus
(Bonnaterre, 1788)

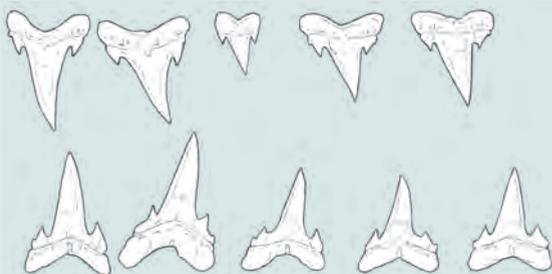
Porbeagle
Requin-taupo commun

VU

LL



Dentition



Teeth approximately actual size.

Teeth with long narrow, smooth-edged cusp, flanked by a single lateral cusplet on each side.

Tooth counts: upper jaw 28–32, lower jaw 26–30.

Description

Stout fusiform-shaped body, with a relatively long, conical snout, teeth with large smooth-edged cusp and small lateral cusplets either side, first dorsal fin erect, high, free rear tip abruptly white, second dorsal and anal fins comparatively small, and prominent secondary caudal keels on crescent-shaped caudal fin.



© Malcolm Francis (NIWA, New Zealand)

Colour

Dorsal surface colour dark bluish-grey, becoming white on ventral surface of body white; free rear tip of first dorsal fin prominently white; underside of head dusky and abdomen blotched in some adults of Southern Hemisphere population.

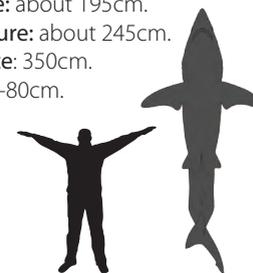
Size

Males mature: about 195cm.

Females mature: about 245cm.

Maximum size: 350cm.

Birth size: 70–80cm.



SIMILAR SPECIES

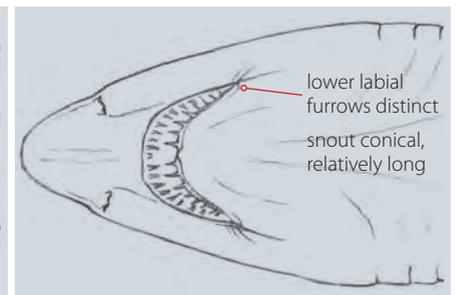
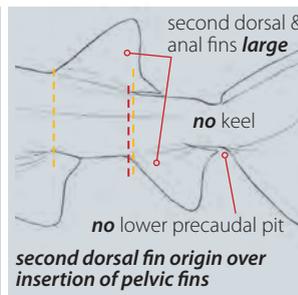
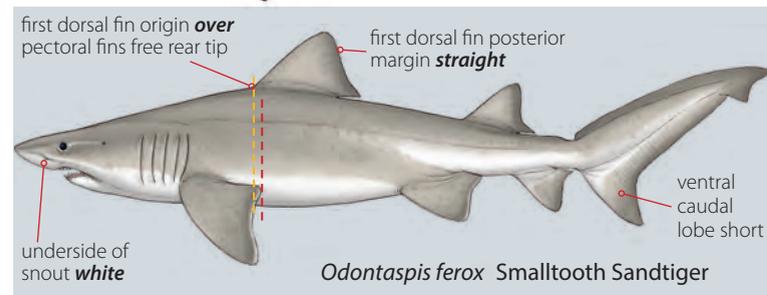
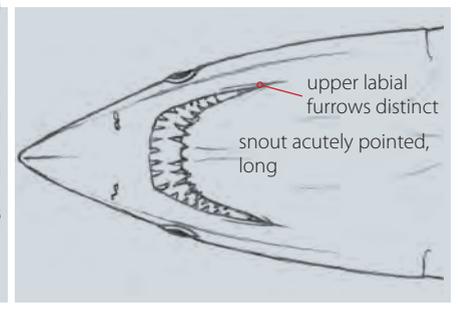
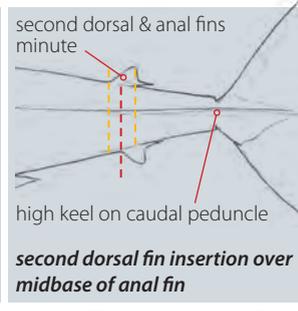
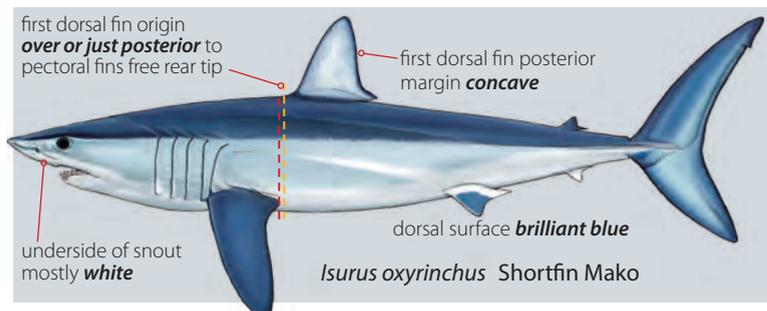
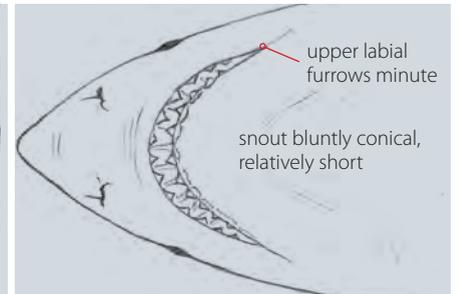
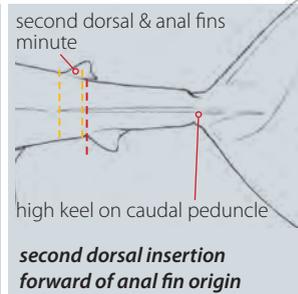
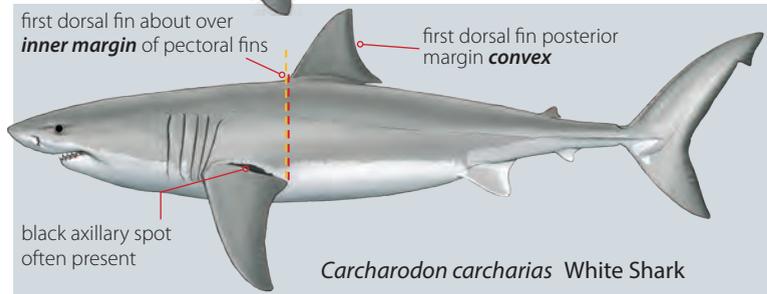
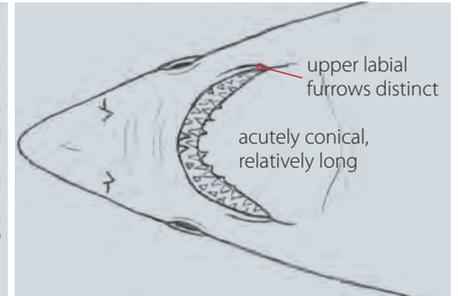
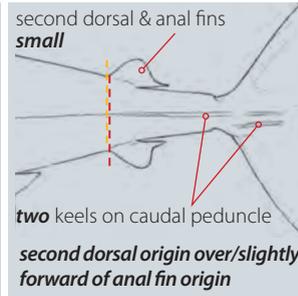
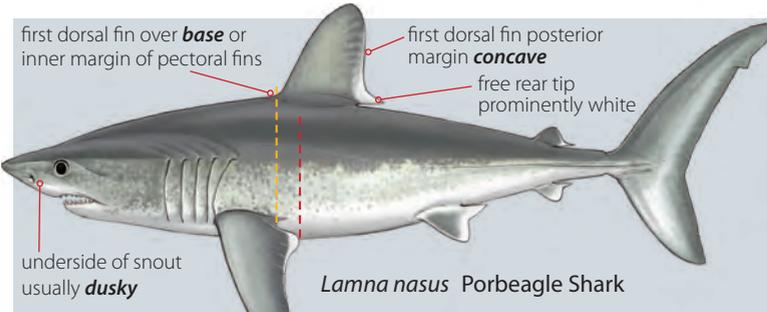
Stout bodied shark; snout relatively long and conical; first dorsal fin high and erect, one high keel either side of the caudal peduncle and one secondary caudal keel either side of caudal fin base; back dark bluish grey, underside

of head dusky, free rear tip of first dorsal fin prominently white; teeth long, narrow and smooth-edged cusp with one lateral cusplet either side.

First dorsal and caudal fins, interdorsal and caudal

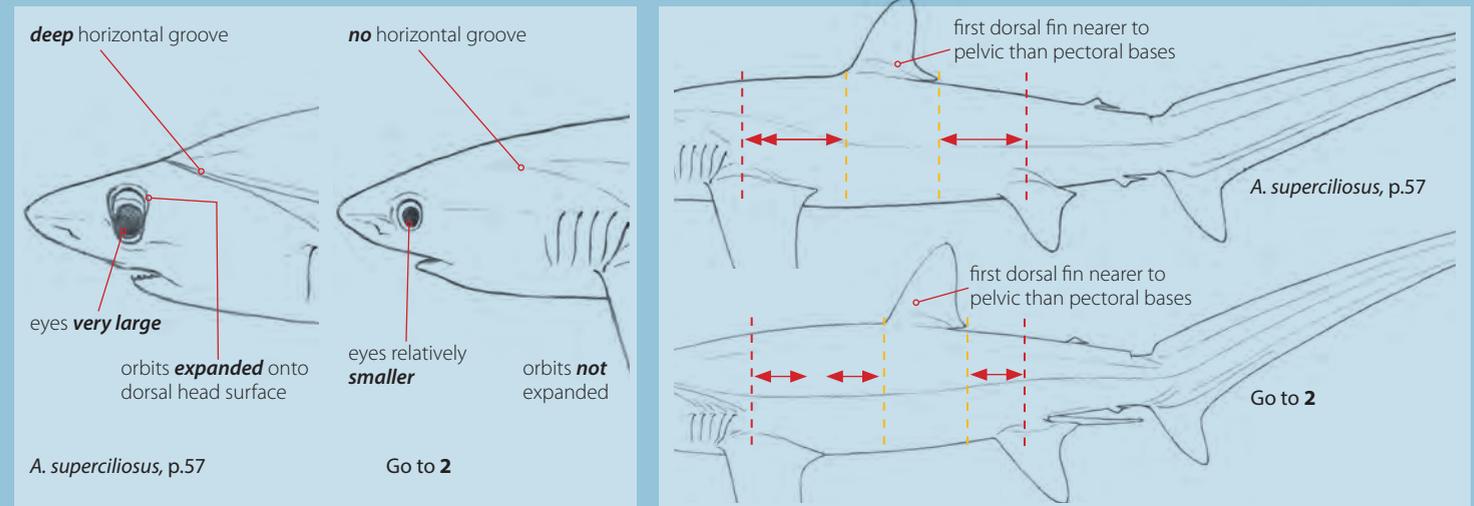
Second dorsal & anal fins

Ventral view of head



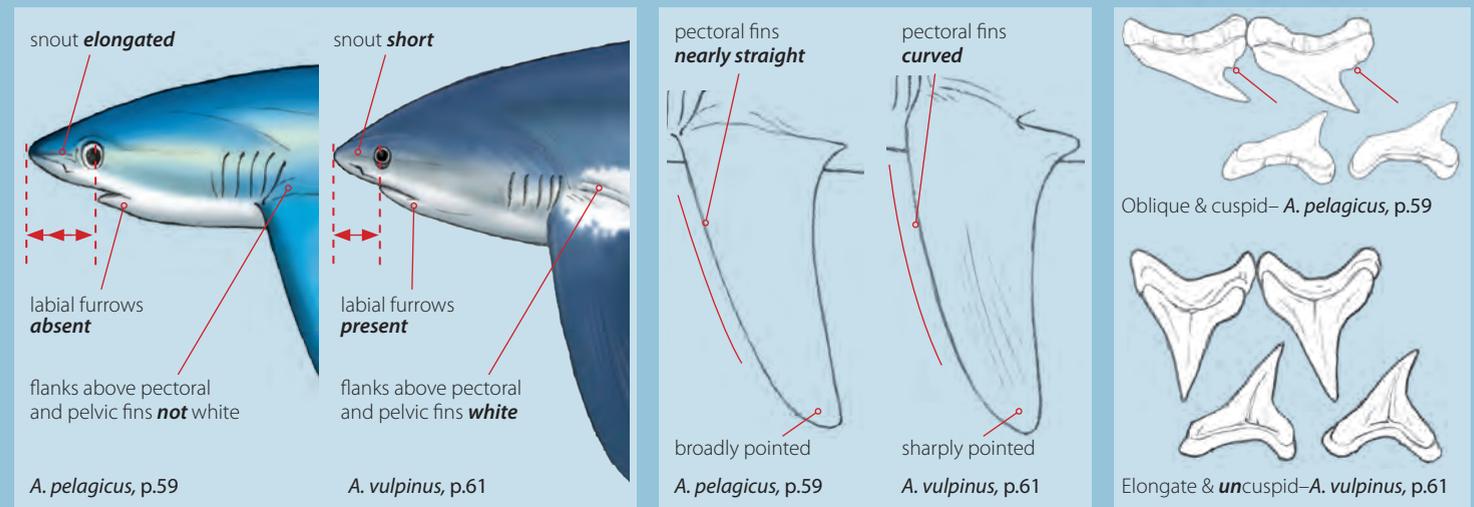
1a Head with a deep horizontal groove extending around each side. Eyes are very large, with orbits expanded onto the dorsal head surface. Base of first dorsal fin closer to pelvic bases than to pectoral bases → *Alopias superciliosus* p.57

1b Head without a deep horizontal groove extending around each side. Eyes relatively smaller, with orbits not expanded. Base of first dorsal fin about equidistant between pectoral and pelvic fin bases or closer to pectoral fin bases → **2**

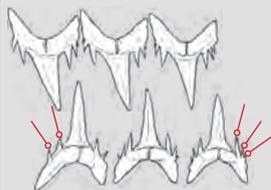


2a Flanks above pectoral and pelvic fins not white; head is narrow and snout is elongated. Labial furrows absent. Pectoral fins nearly straight and broadly pointed; teeth oblique with a secondary cusp → *Alopias pelagicus* p.59

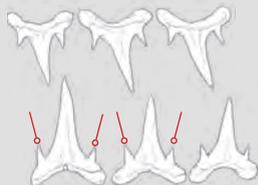
2b Flanks above pectoral and pelvic fins white; head is broad and snout is short. Labial furrows present. Pectoral fins curved and sharply pointed; teeth elongate and unicuspid → *Alopias vulpinus* p.61



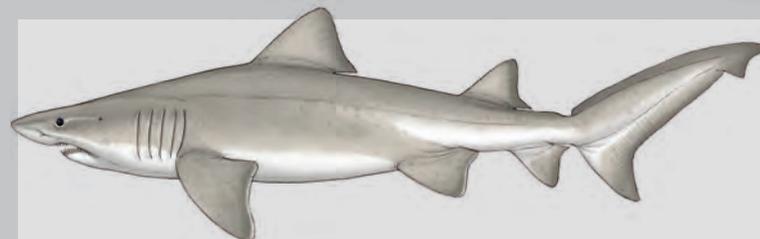
- 1a** Teeth mostly with **2–3 cusplets** on each side of cusp. 3–4 rows of small intermediate teeth between upper anterior and lateral rows. Anal fin posterior margin **strongly concave**. **Lighter ventral side**, dorsal with faint spots → ***Odontaspis ferox***, p.63
- 1b** Teeth with only **1 cusplet** on each side of cusp. 1 row of small intermediate teeth between upper anterior and lateral rows. Anal fin posterior margin is **straight**. **Uniform dark colour** → ***Odontaspis noronhai***, p.65



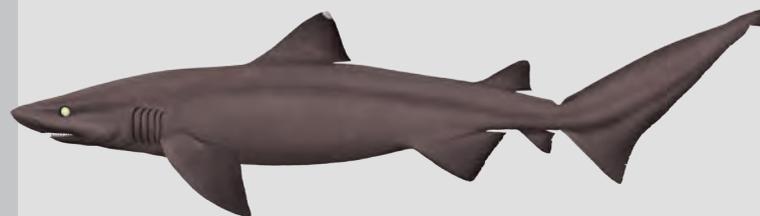
Two to three cusplets on each side— *O. ferox*, p.63



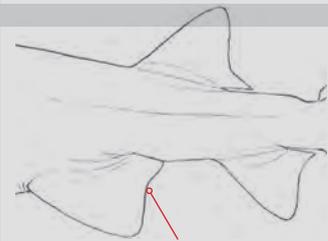
One cusplet on each side— *O. noronhai*, p.65



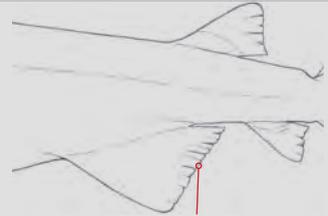
Grey or grey-brown above, **lighter below**, often with faint spots, **no white-tipped first dorsal fin**— *O. ferox*, p.63



Uniform dark colour— *O. noronhai*, p.65



Anal fin posterior margin **strongly concave**— *O. ferox*, p.63



Anal fin posterior margin is **straight**— *O. noronhai*, p.65

Pseudocarchariidae

Confusion species comparison → ***P. kamoharai***, p.67



Five **long** gill slits on each side of head
Two dorsal fins, **first dorsal fin approximately midpoint along body**
Anal fin present, origin behind **second dorsal fin** insertion—

Pseudocarcharias kamoharai, p.67



Five **short** gill slits on each side of head
Two dorsal fins, **first dorsal fin set well back just in front of pelvic fins**
No anal fin—

Isistius brasiliensis



Seven long gill slits on each side of head
One dorsal fins, set well back just behind pelvic fins
Anal fin present, origin behind **first dorsal fin** insertion—

Hepttranchias perlo

Alopias pelagicus

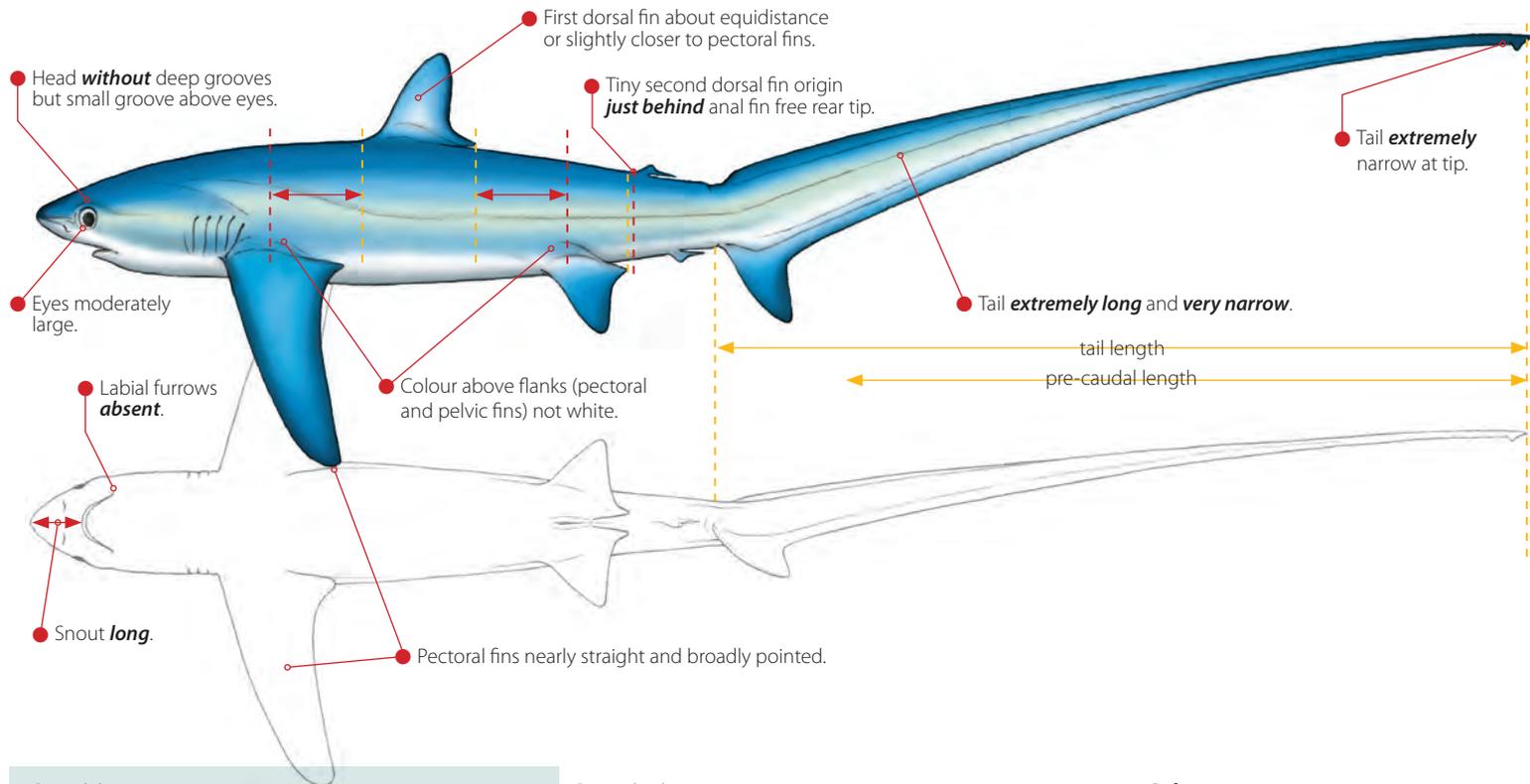
Nakamura, 1935

Pelagic Thresher Shark

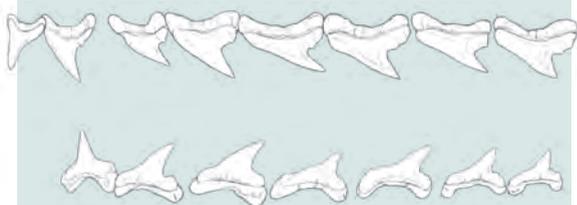
Renard Pélagique

VU

LL



Dentition



Teeth approximately actual size.

Teeth oblique with small secondary cusp posterior to the primary cusp, with intermediate teeth.

Tooth counts: upper 41–45, lower 37–48.

Description

Smallest thresher shark, with flanks dark above pectoral and pelvic fins; head narrow and snout elongated; eyes moderately large; labial furrows absent; pectoral fins nearly straight and broadly pointed; tail very thin at tip.



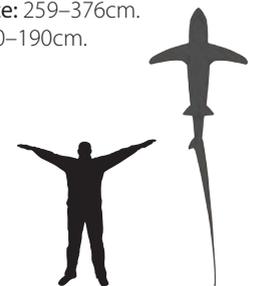
© Reeve/Henderson (Sultan Qaboos University, Muscat, Oman)

Colour

Metallic pale to dark blue, grey, or purplish brown dorsally and on fins, changing to white ventrally at the level of the pectoral and pelvic fins, but not extending over fins.

Size

Males mature: 265–275cm.
Females mature: 280–290cm.
Maximum size: 259–376cm.
Birth size: 160–190cm.



Alopias pelagicus

Caudal fin at least as long as body length

5 Gills

Anal fin

SHARK

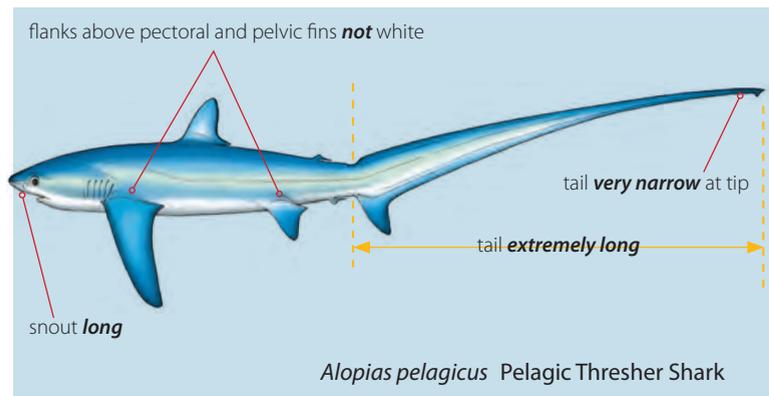
57

SIMILAR SPECIES

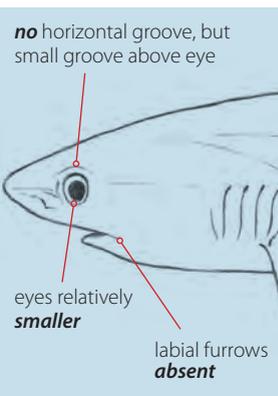
Head without deep grooves extending along each side of head, but small groove only above eye region, eyes moderately large; first dorsal fin about equidistant or slightly closer to pectoral fins, small second dorsal fin just behind

free rear tip of anal fin, extremely long tail very narrow at tip; colour above the flanks of the pectoral and pelvic fins, not white.

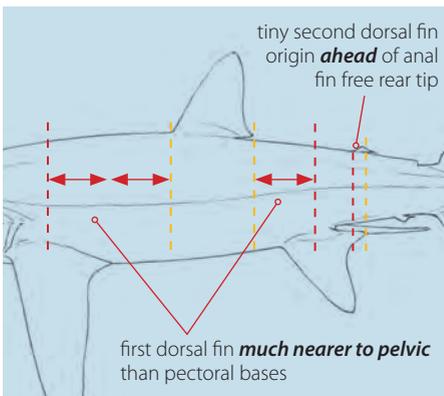
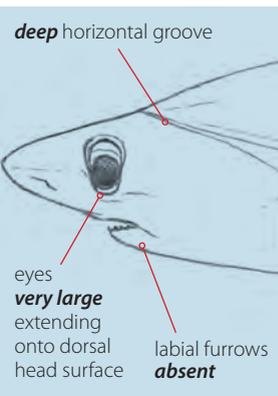
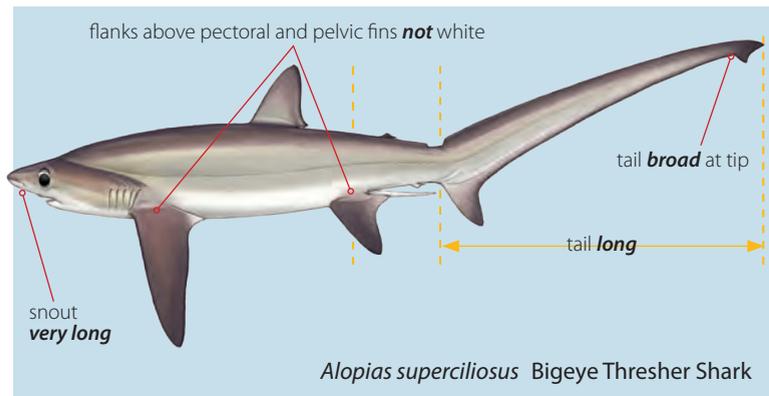
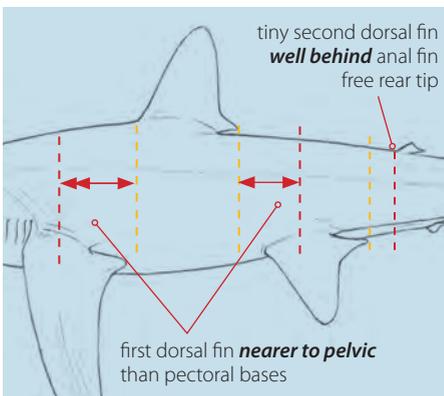
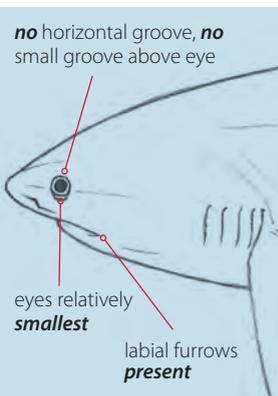
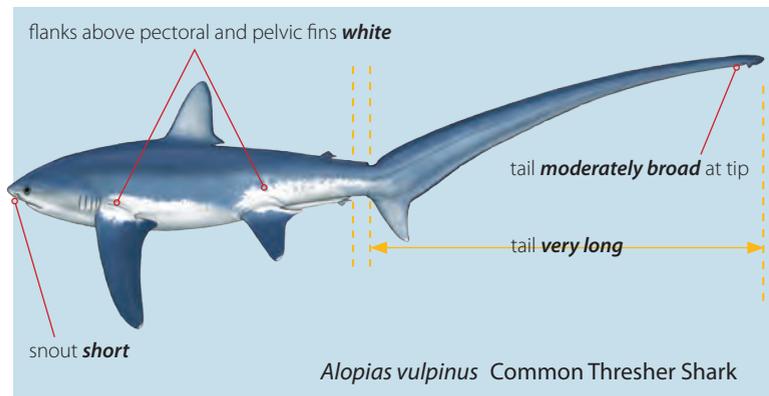
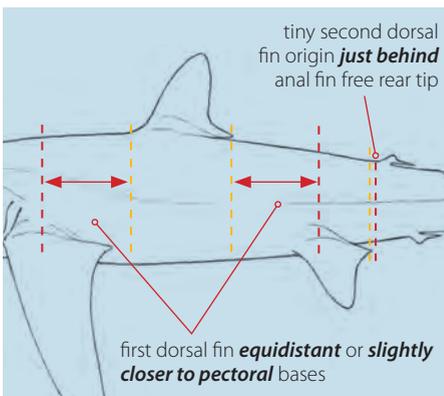
Colour on flanks above pectorals and pelvics and fin shapes



Lateral view of head



Dorsal fins positions



Alopias superciliosus

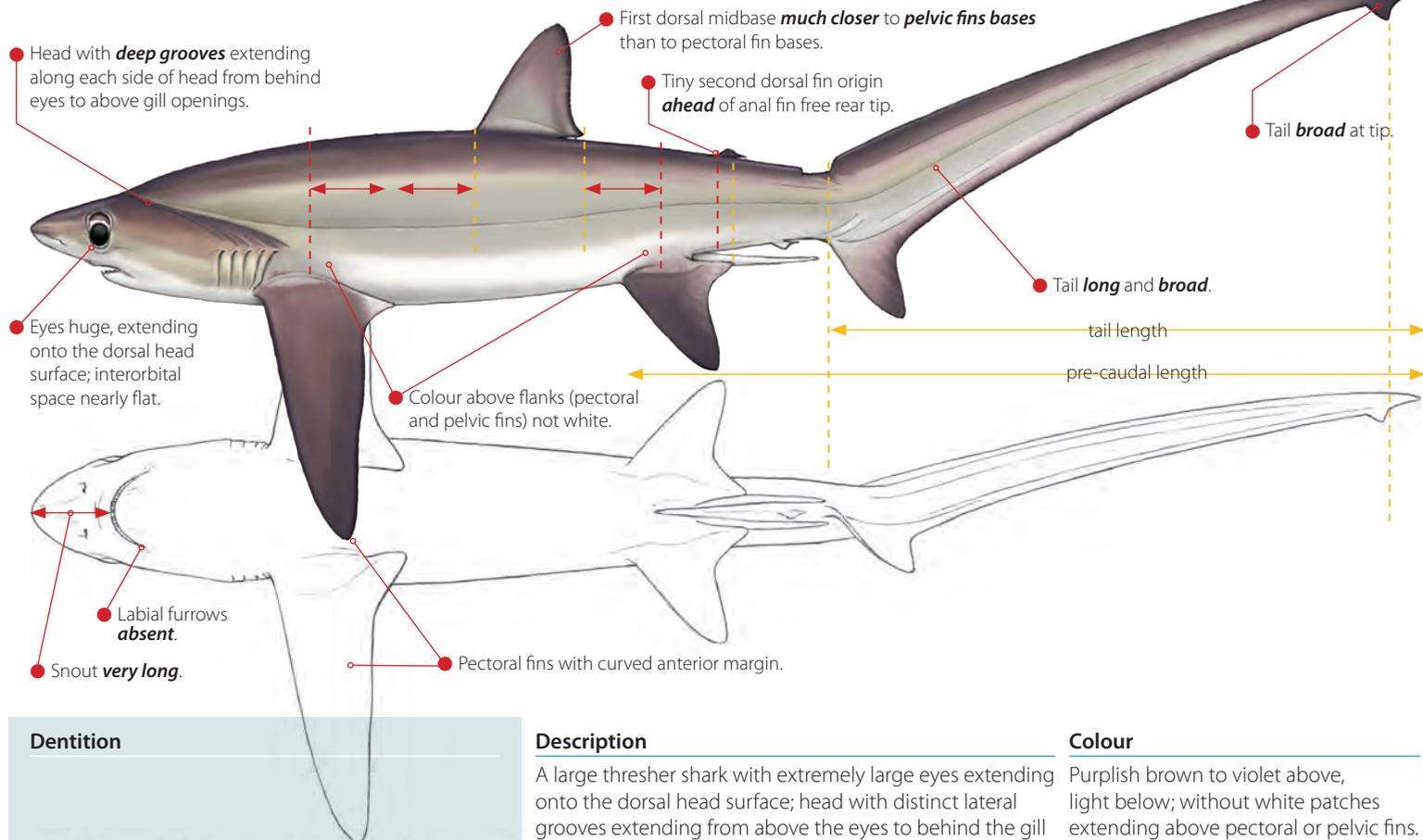
(Lowe, 1841)

Bigeye Thresher Shark

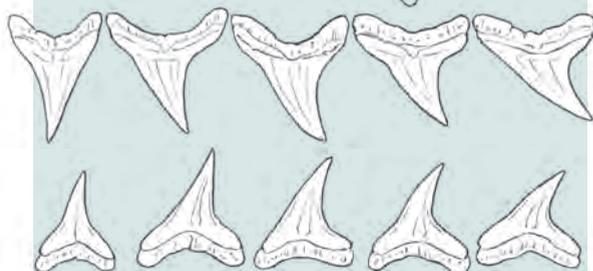
Renard à Gros Yeux

VU

LL



Dentition



Teeth approximately actual size.

Teeth large, with a long slender, smooth-edged cusp, no lateral cusplets, similar in both jaws; no intermediate teeth.

Tooth rows: upper 19–27, lower 19–24.

Description

A large thresher shark with extremely large eyes extending onto the dorsal head surface; head with distinct lateral grooves extending from above the eyes to behind the gill slits (appearing helmet-like); labial furrows absent; pectoral fins with curved anterior margin and broadly tipped at the apices; tail broad at fin tip.



© NOAA Fisheries, USA

Colour

Purplish brown to violet above, light below; without white patches extending above pectoral or pelvic fins.

Size

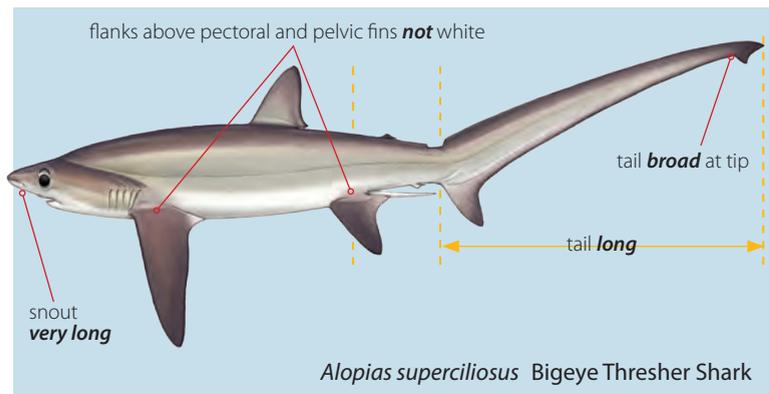
Males mature: 270–290cm.
Females mature: 330–360cm.
Maximum size: 410–490cm.
Birth size: 130–140cm.



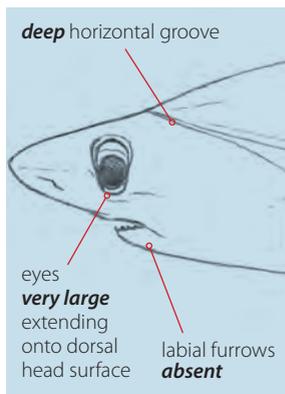
SIMILAR SPECIES

Head with deep grooves extending along each side of head, eyes huge extending onto the dorsal surface of the head; first dorsal fin midbase closer to pelvic fin bases than to pectoral fin bases, small second dorsal fin over free rear

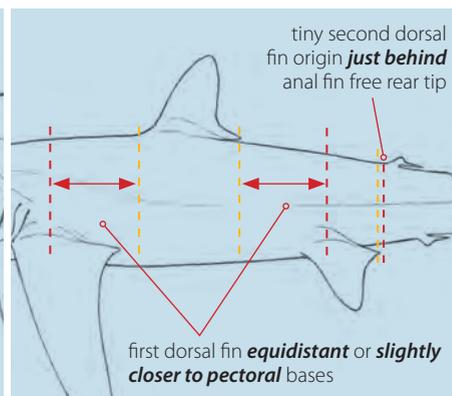
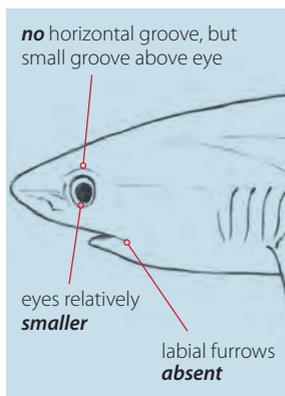
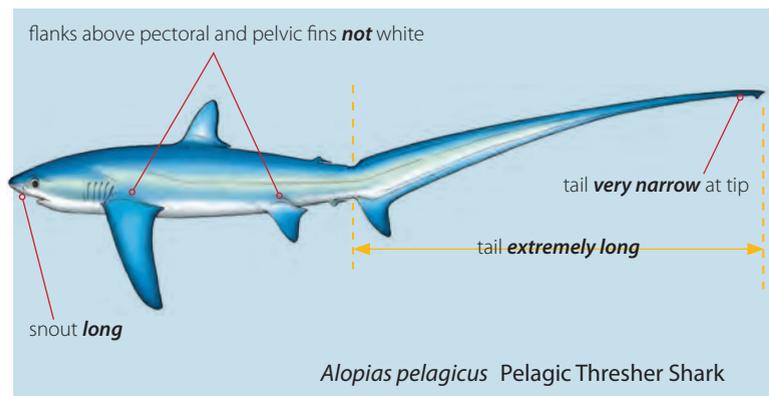
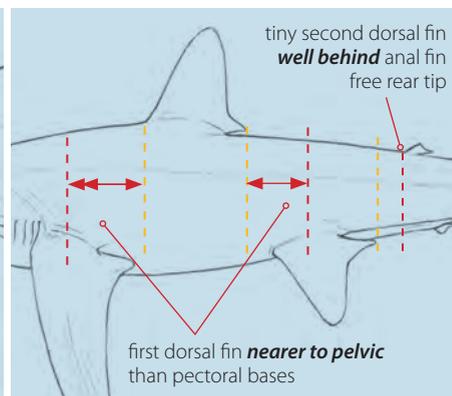
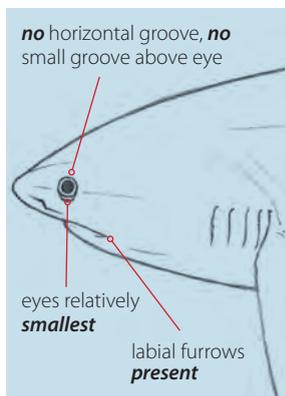
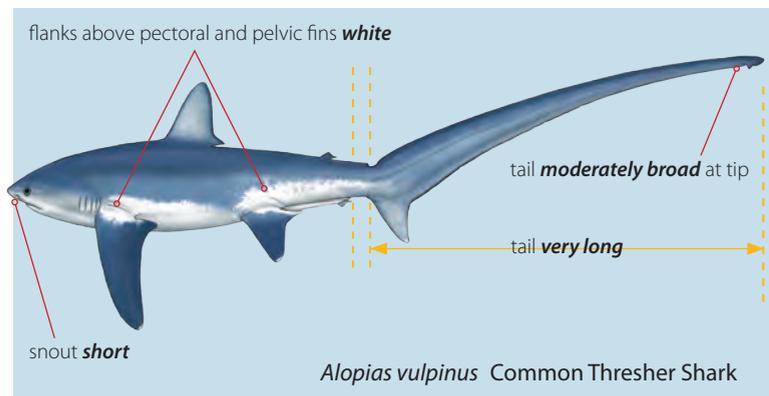
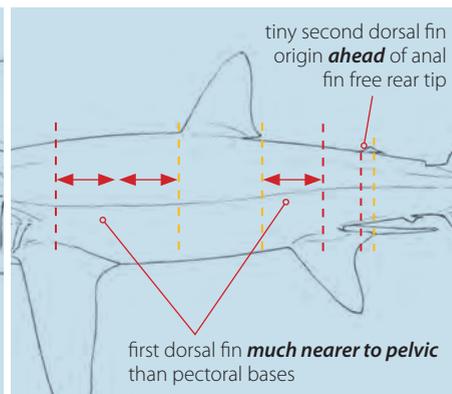
Colour on flanks above pectorals and pelvics and fin shapes



Lateral view of head



Dorsal fins positions



Alopias vulpinus

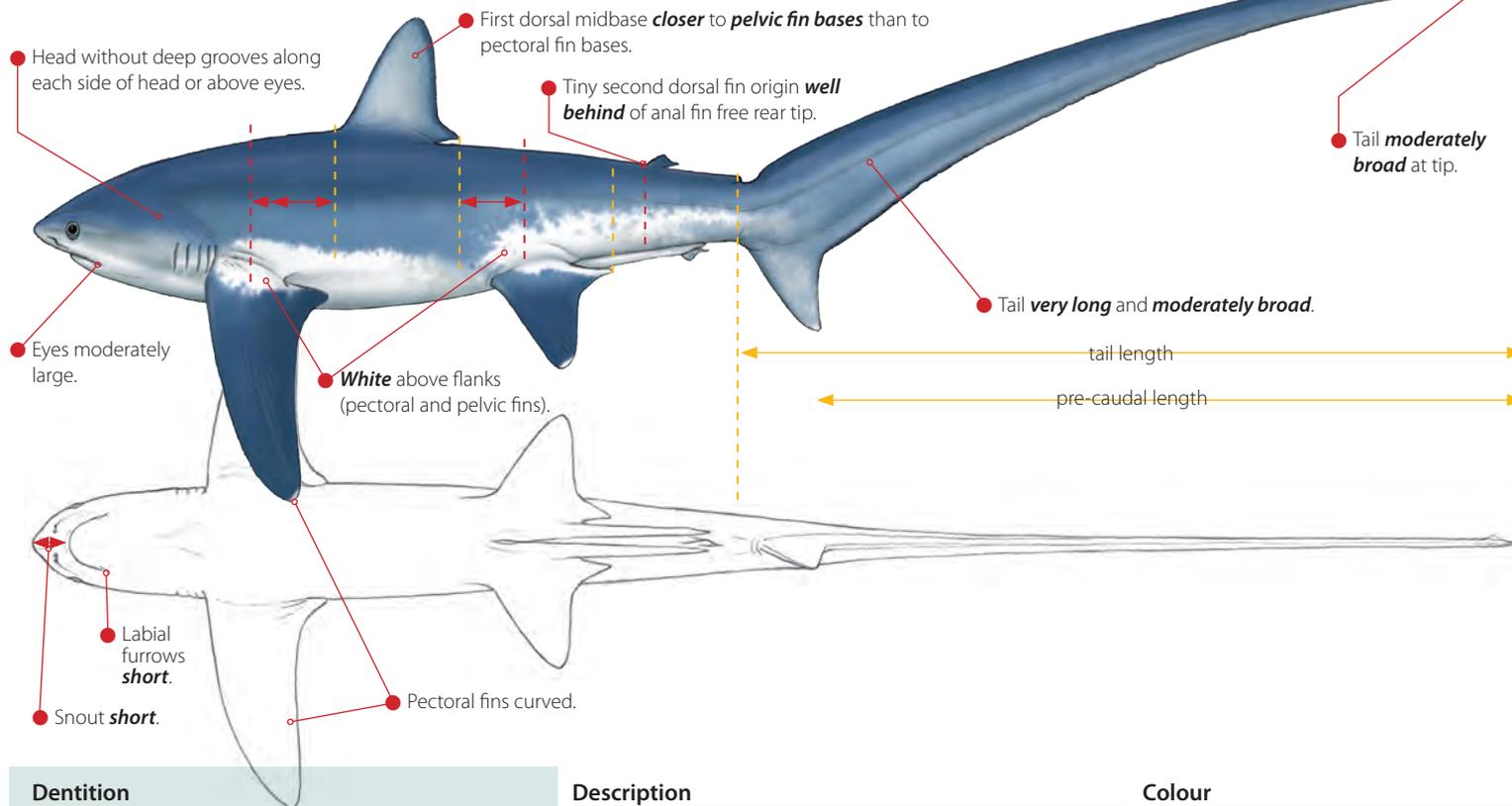
(Bonnaterre, 1788)

Common Thresher Shark

Renard

VU

LL



Alopias vulpinus

Caudal fin at least as long as body length

Dentition



Teeth approximately actual size.

Teeth relatively small, with a single smooth-edged, slightly oblique, triangular cusp; intermediate tooth rows usually present.

Tooth counts: upper 32–52, lower 25–51.

Description

Largest of the thresher sharks, with distinctive white over pectoral and pelvic fins; head broad, without deep grooves extending along each side; labial furrows present; eye moderately large, but not extending onto head; first dorsal fin closer to pectoral fins; pectoral fins curved, with curved anterior margins and pointed tips; tail tip moderately broad.



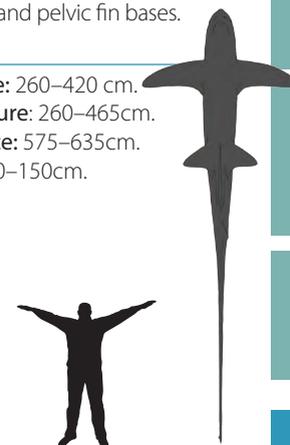
© NOAA Fisheries, USA

Colour

Upper body surface silvery to bluish grey or dark grey, ventral surface white, with conspicuous white patches extending over pectoral and pelvic fin bases.

Size

Males mature: 260–420 cm.
Females mature: 260–465 cm.
Maximum size: 575–635 cm.
Birth size: 120–150 cm.



5 Gills

Anal fin

SHARK

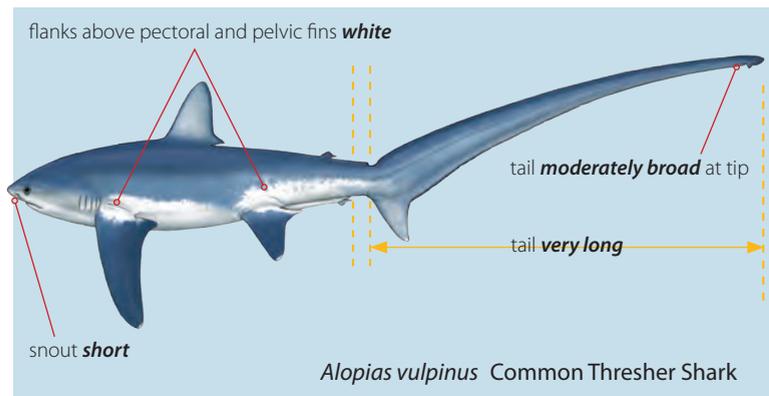
61

SIMILAR SPECIES

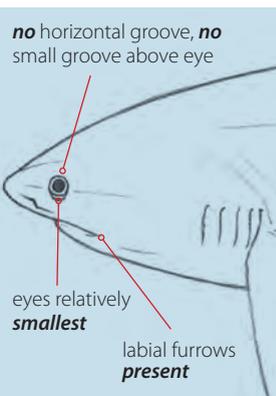
Head without deep grooves along each side; eyes moderately large; first dorsal fin closer to pectoral fins, small second dorsal fin well behind free rear tip of

anal fin, very long tail moderately broad at tip; white above the flanks of the pectoral and pelvic fins.

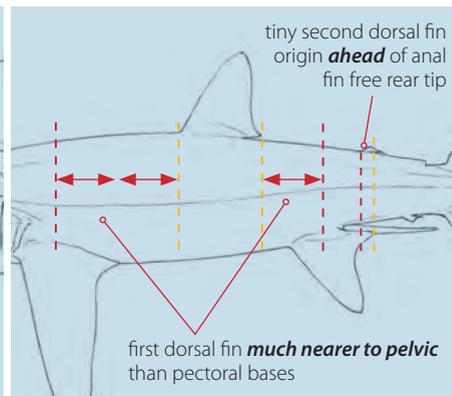
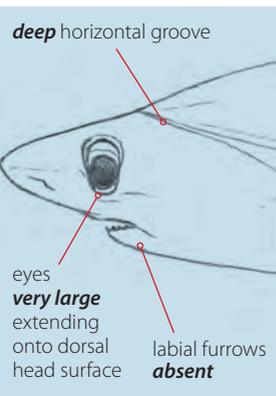
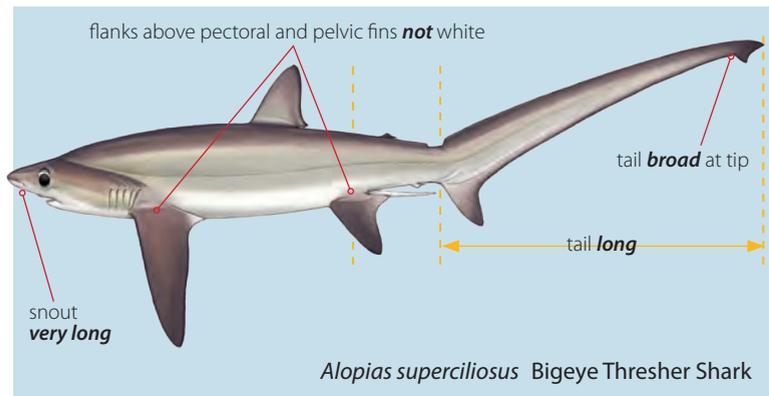
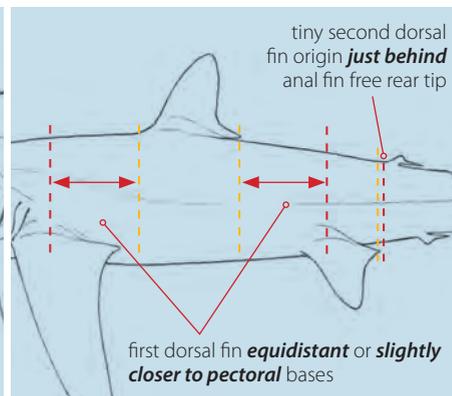
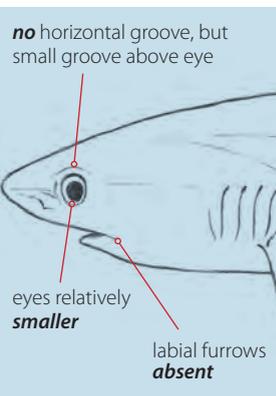
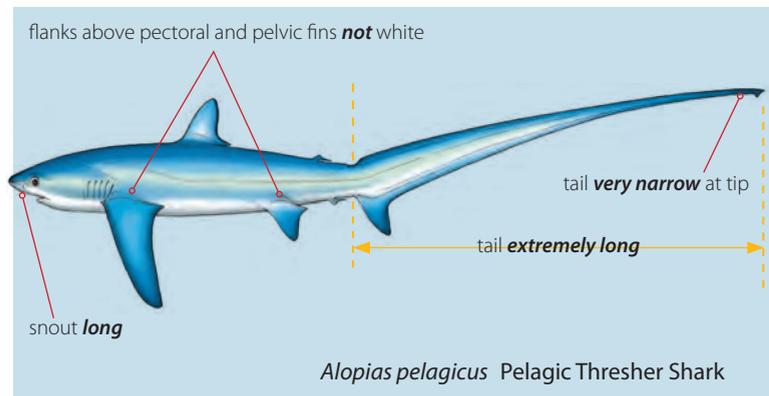
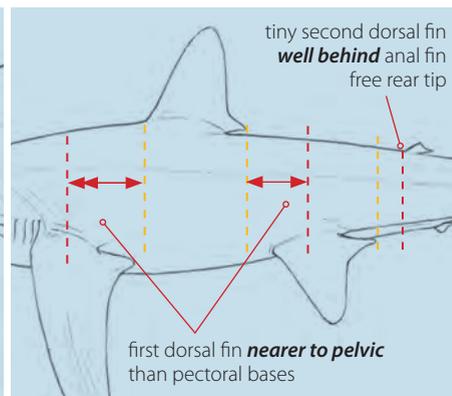
Colour on flanks above pectorals and pelvics and fin shapes



Lateral view of head



Dorsal fins positions



Odontaspis ferox

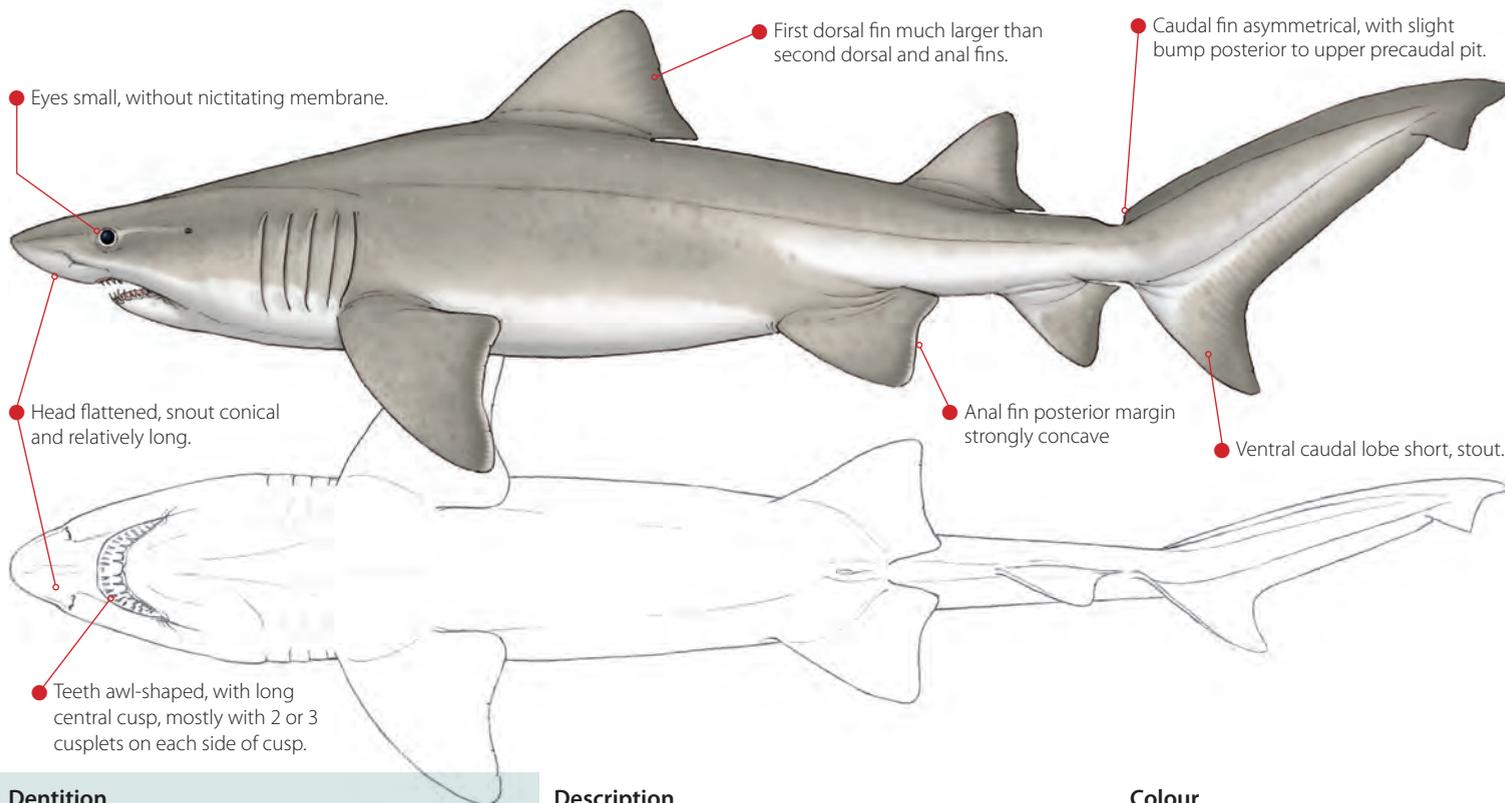
(Risso, 1810)

Smalltooth Sandtiger

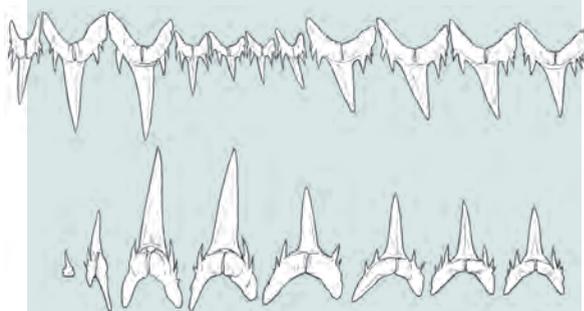
Requin féroce

VU

LL



Dentition



Teeth approximately actual size.

Teeth are prominent, awl-shaped, long and narrow with a central cusp flanked by two or three smaller cusplets on each side.

Tooth counts: upper jaw 46–56, lower jaw 36–48.

Description

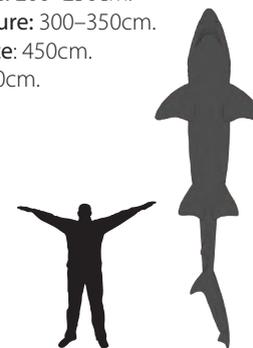
A large, stout-bodied shark with a conical to slightly flattened snout, a long mouth extending past the eyes, a first dorsal fin that originates over the pectoral fins free rear tips, and is much larger than the second dorsal and anal fins.

Colour

Grey or grey-brown above, lighter below, often with darker (reddish) spots on sides but without a white-tipped first dorsal fin.

Size

Males mature: 200–250cm.
Females mature: 300–350cm.
Maximum size: 450cm.
Birth size: 100cm.



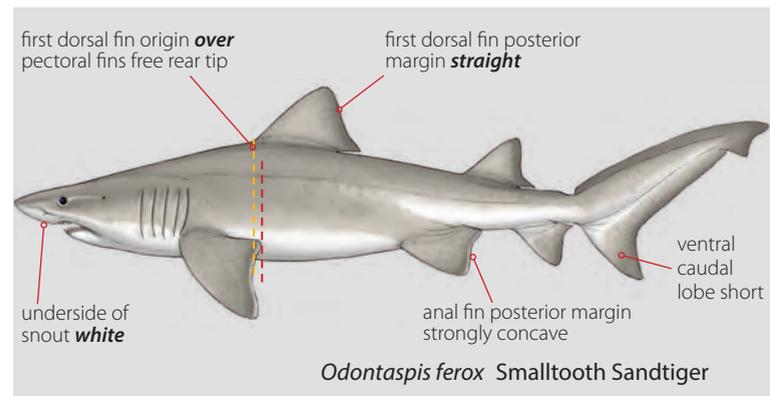
© Hsu Hua Hsun

SIMILAR SPECIES

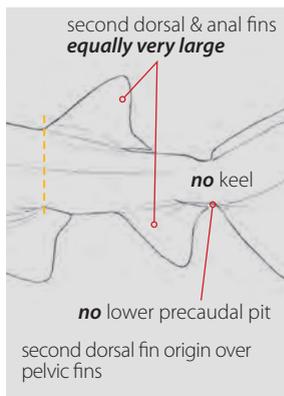
A large, stout-bodied shark; bulbous, conical snout; first dorsal fin closer to pectoral than pelvic fins and much larger than second dorsal and anal fins; a

small bump in front of upper caudal pit; greyish, sometimes with red spots on sides; protruding teeth which are awl-shaped.

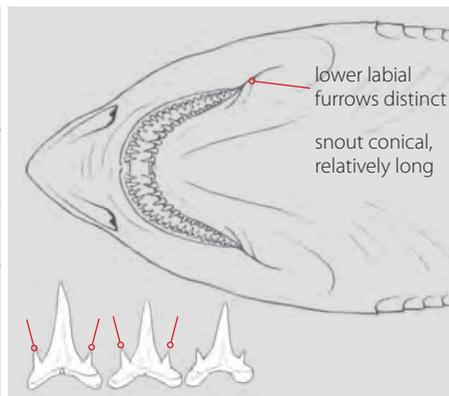
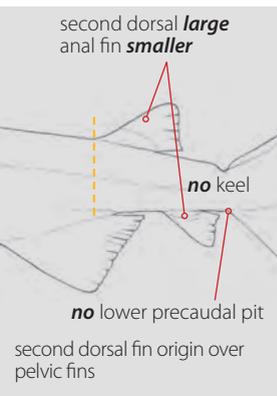
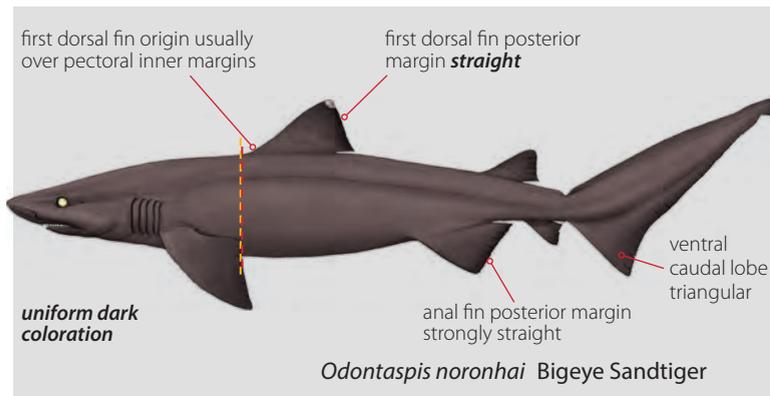
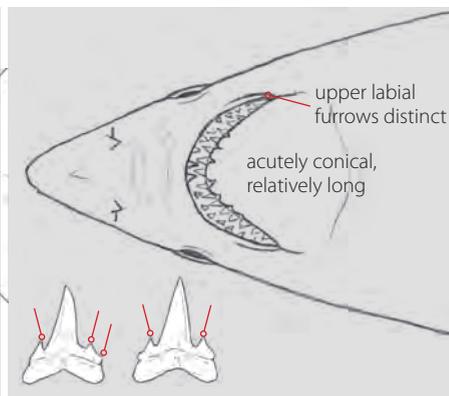
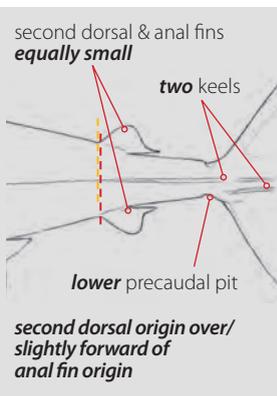
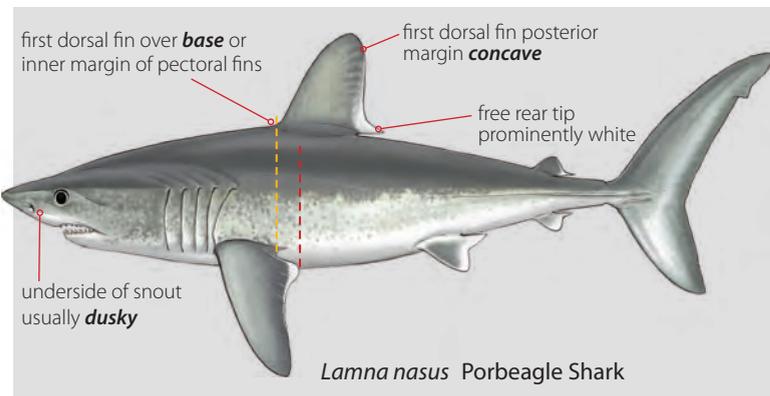
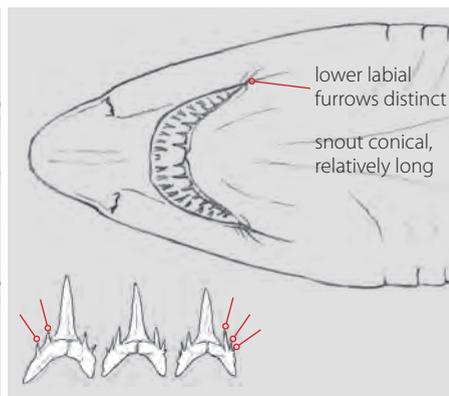
Colour, first dorsal fin position and first dorsal, anal and caudal fins shape



Second dorsal & pelvic fins



Ventral view of heads and teeth



Odontaspis noronhai

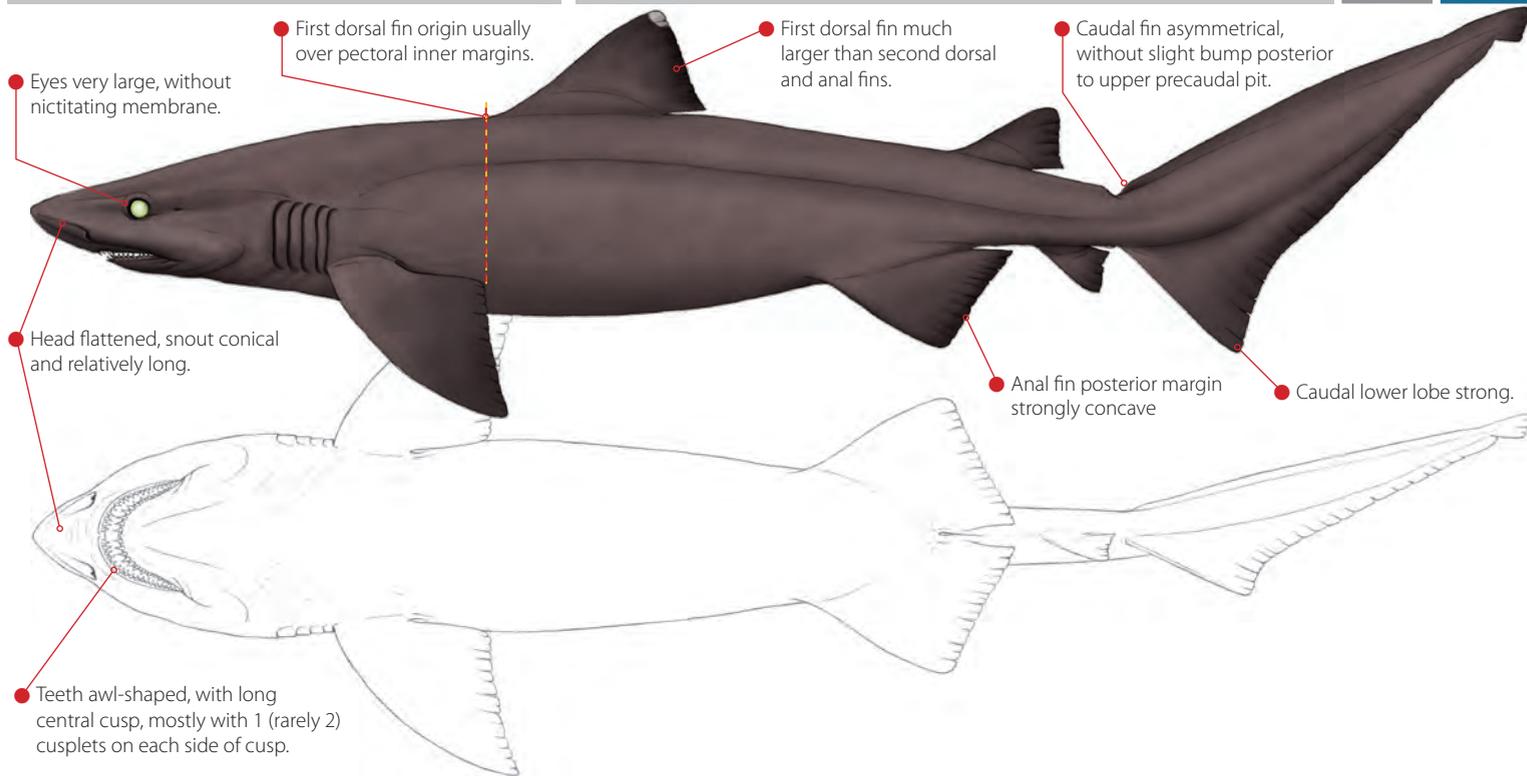
Maul, 1955

Bigeye Sandtiger Shark

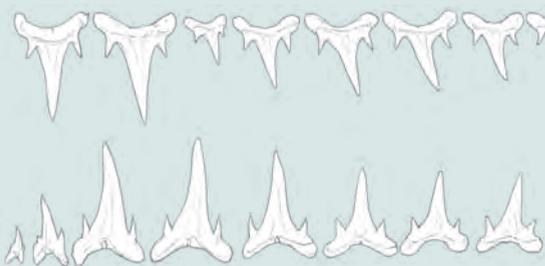
Requin noronhai

DD

LL



Dentition



Teeth approximately actual size.

Teeth are prominent, awl-shaped, long and narrow with a central cusp flanked by one smaller cusplets on each side.

Tooth counts: upper jaw 34–43, lower jaw 37–46.

Description

A large, bulky shark with a long bulbously conical snout; eyes very large without nictitating eyelids, mouth long and extending behind eyes; anal fin and second dorsal fin smaller than first dorsal fin; first dorsal fin closer to pectoral fins than to pelvic fins, upper precaudal pit present but lateral keels absent from caudal peduncle, caudal fin asymmetrical but with a strong lower lobe.



© Ryan Downie, CSIRO.

Colour

Uniformly black, chocolate brown or dark reddish brown, without dark spots on sides of body; fins black, first dorsal fin often with a white blotch at tip.

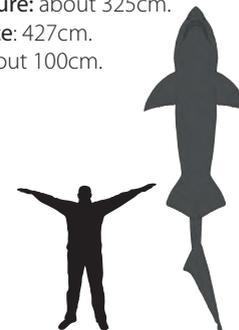
Size

Males mature: 325–340cm.

Females mature: about 325cm.

Maximum size: 427cm.

Birth size: about 100cm.

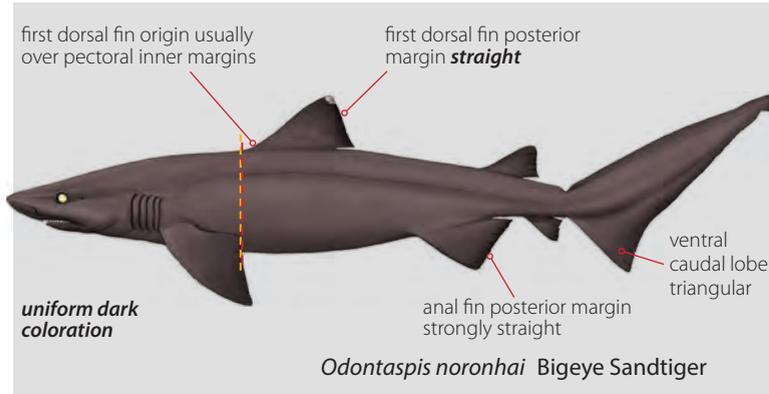


SIMILAR SPECIES

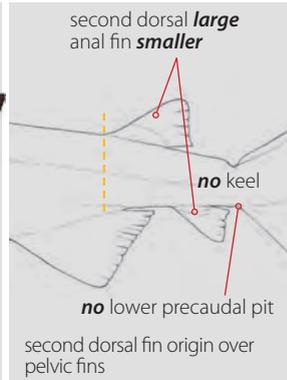
First dorsal fin much larger than second dorsal and anal fins, upper precaudal pit without a bump; uniform black to dark reddish brown without spots on

sides, first dorsal fin tip usually white-tipped.

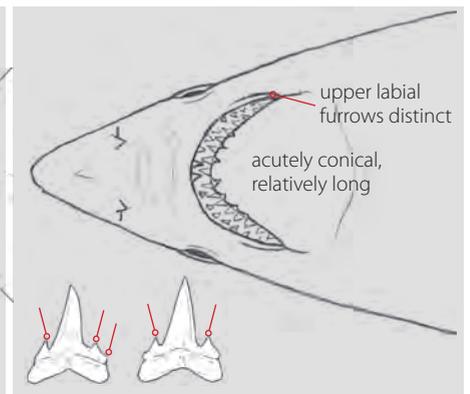
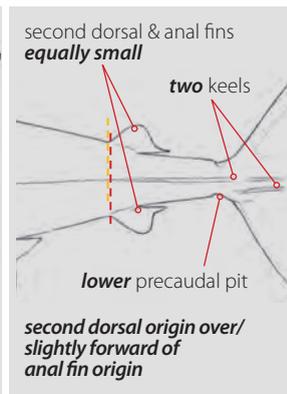
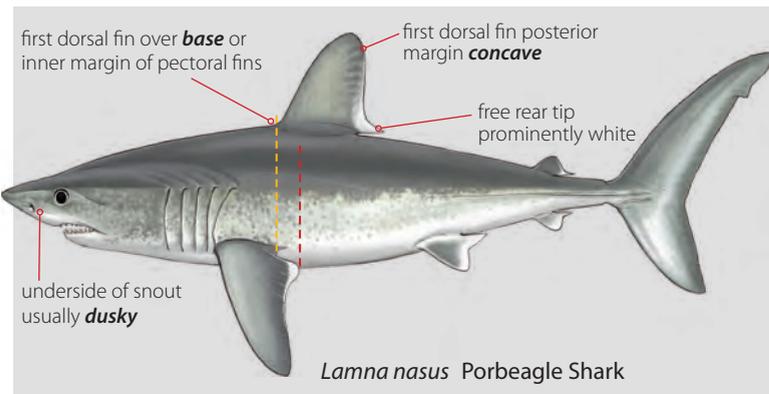
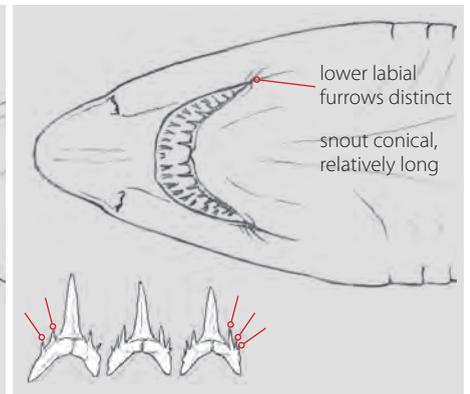
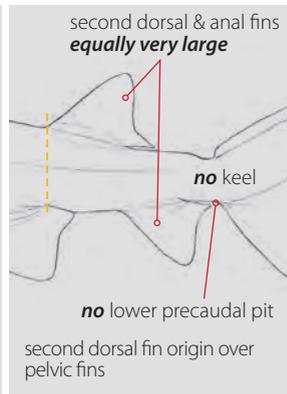
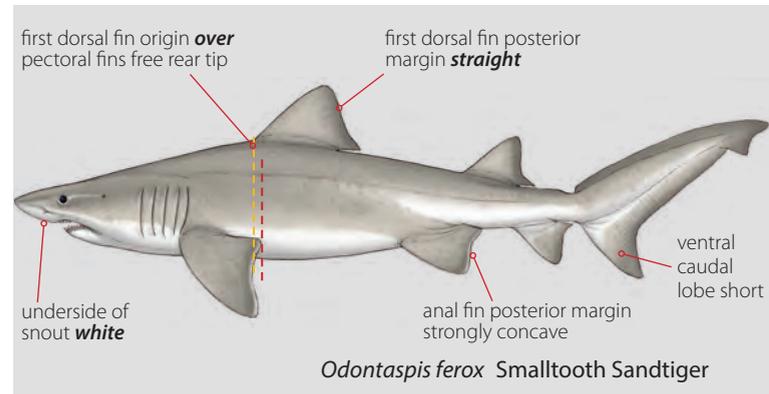
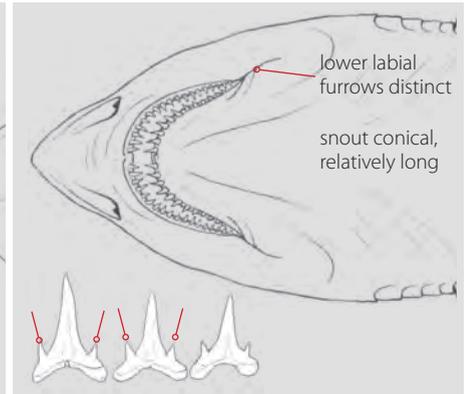
Colour, first dorsal fin position and first dorsal, anal and caudal fins shape



Second dorsal & pelvic fins



Ventral view of heads and teeth

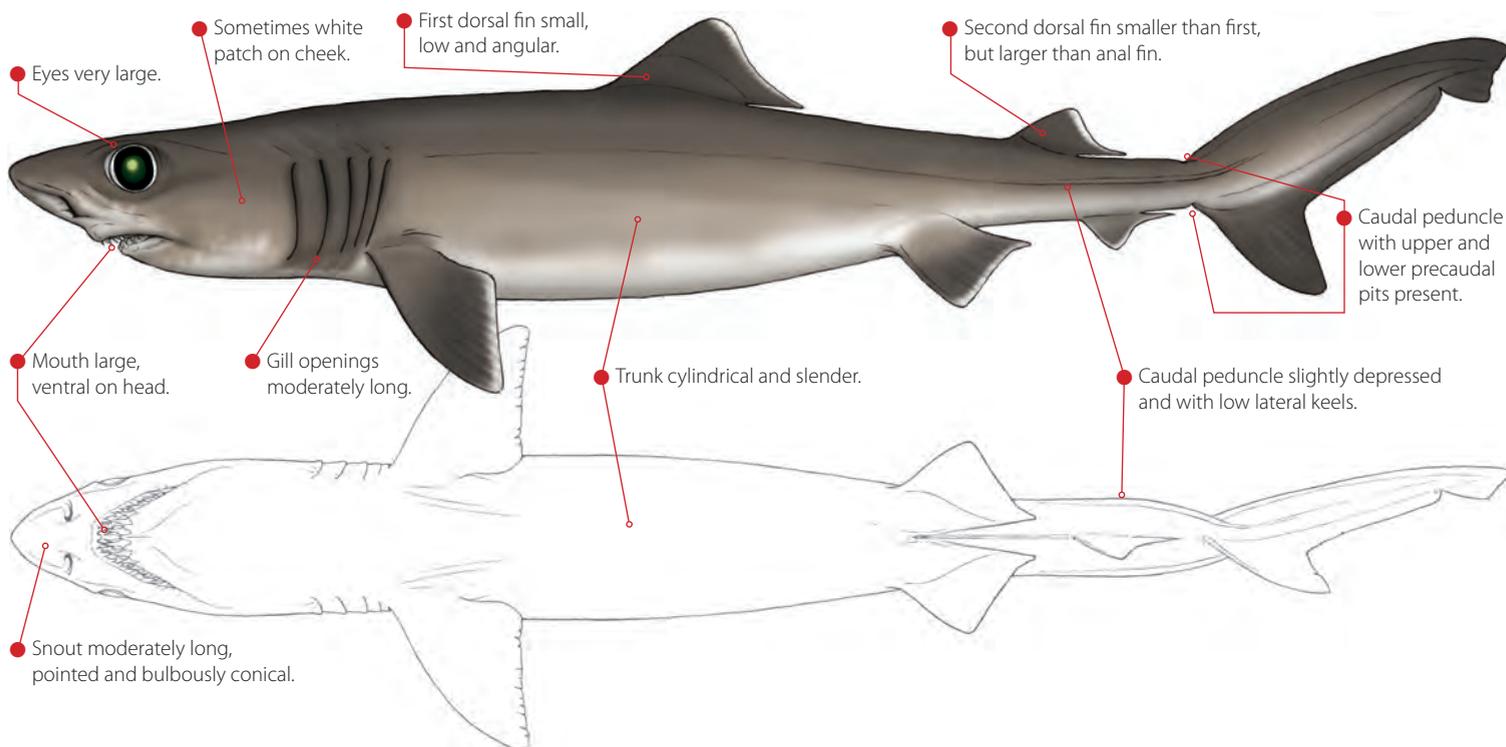


Pseudocarcharias kamoharai
(Matsubara, 1936)

Crocodile Shark
Requin crocodile

NT

LL



Dentition



Teeth approximately actual size.

Teeth large, anteriors narrow and awl-like.

Tooth counts: upper jaw 26–29, lower jaw 21–26.

Description

A small, very distinctive oceanic shark, with huge eyes lacking nictitating eyelids, long gill slits, slender, spindle-shaped body, long-cusped prominent teeth in a long angular mouth with highly protrusible jaws, small pectoral fins, two small spineless dorsal fins and an anal fin; low keels and precaudal pits on the caudal peduncle, an asymmetrical caudal fin with a long lower lobe.



© David A. Ebert

Colour

Grey to grey-brown above, lighter ventrally, and with light-edged fins; some individuals with a lighter spot on the checks.

Size

Males mature: 75–80cm.

Females mature: 85–100cm.

Maximum size: 122cm.

Birth size: 40–50cm.

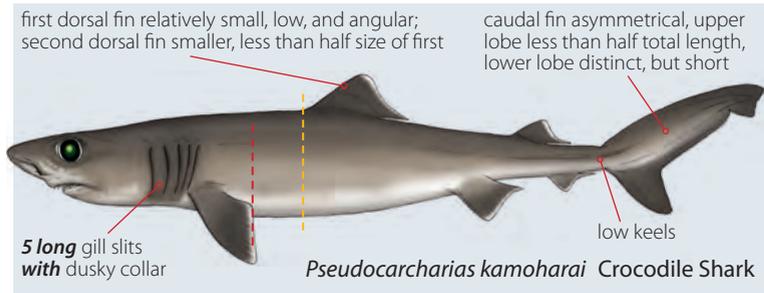


SIMILAR SPECIES

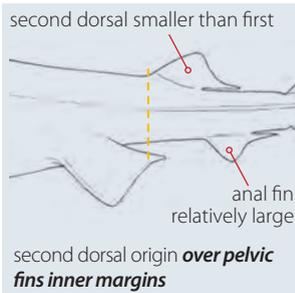
A relatively small, less than 1.3m total length, spindle-shaped shark; large eyes; relatively small pectoral fins, caudal fin is asymmetrical, upper and lower

precaudal pits; dark brown or greyish above, lighter below, some with white spots or blotches on cheeks; long spiky teeth.

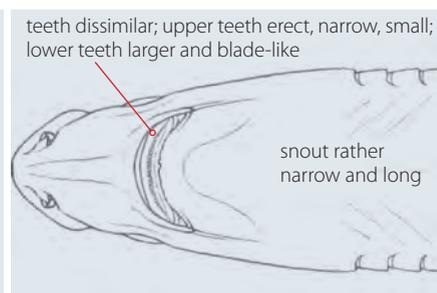
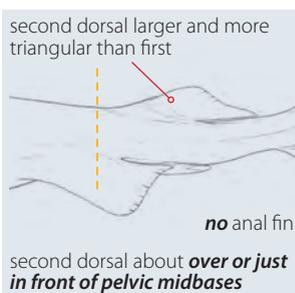
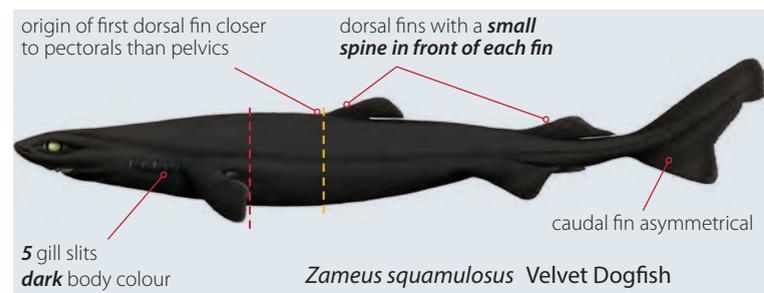
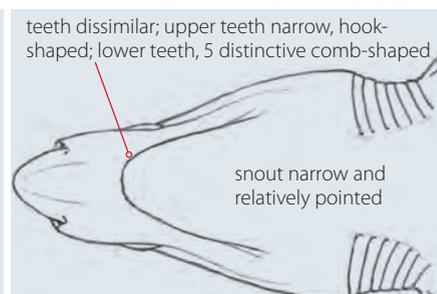
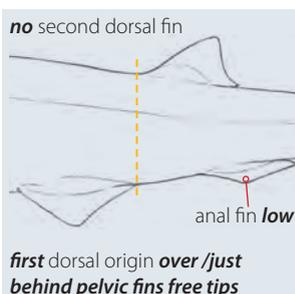
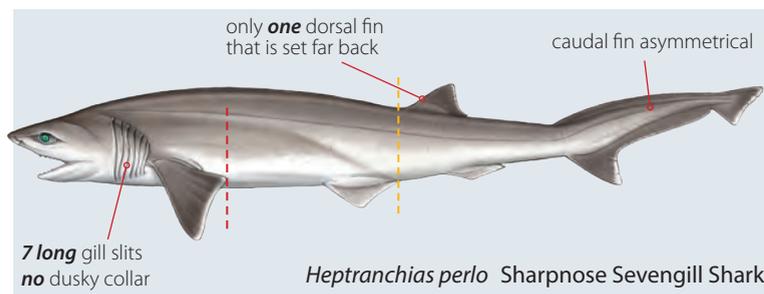
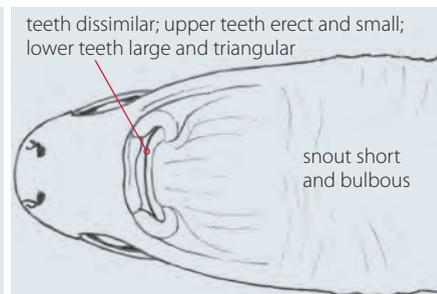
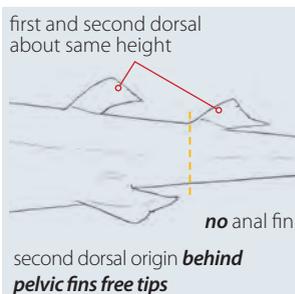
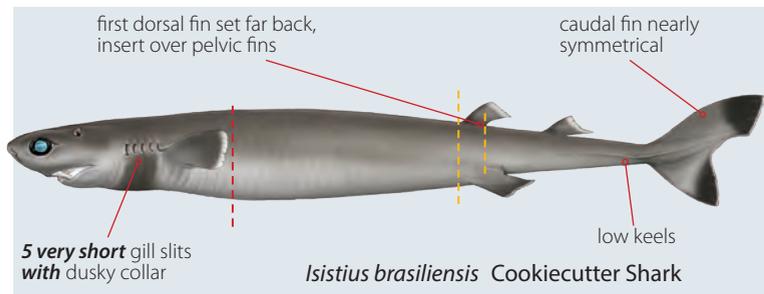
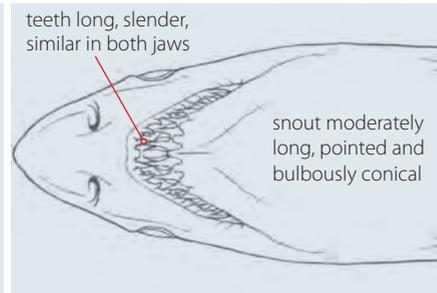
Colour, first dorsal fin position and first dorsal and caudal fins shape



Second dorsal & anal fins



Ventral view of heads and teeth



Rhincodon typus

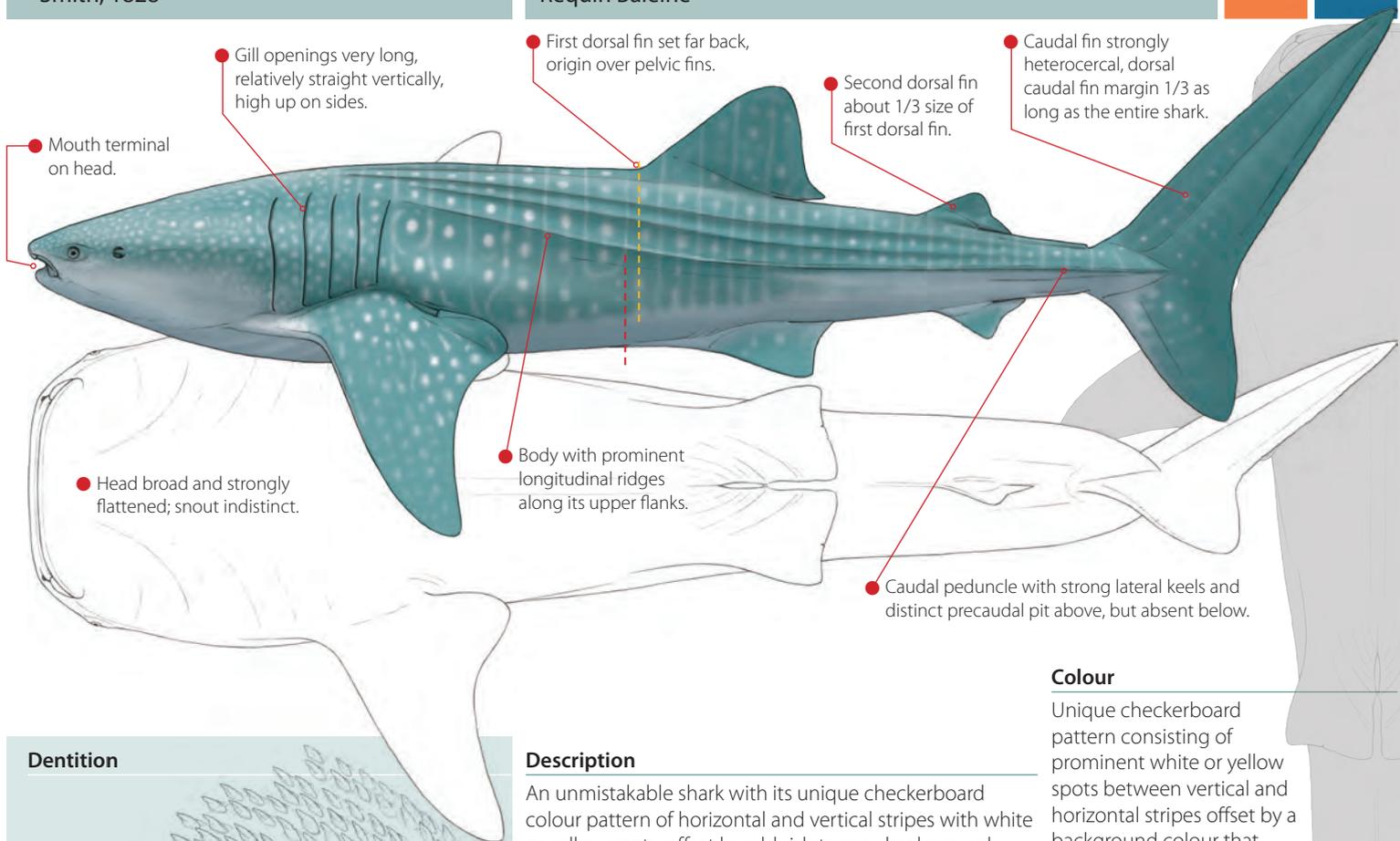
Smith, 1828

Whale Shark

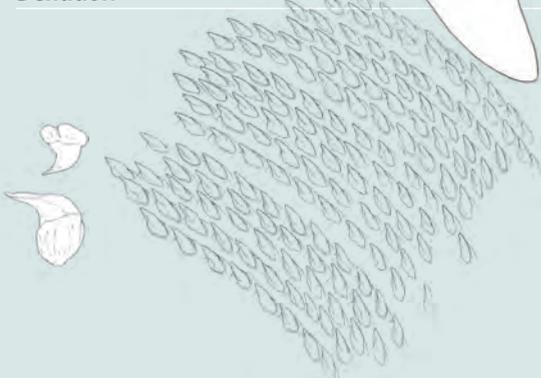
Requin Baleine

VU

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Dentition



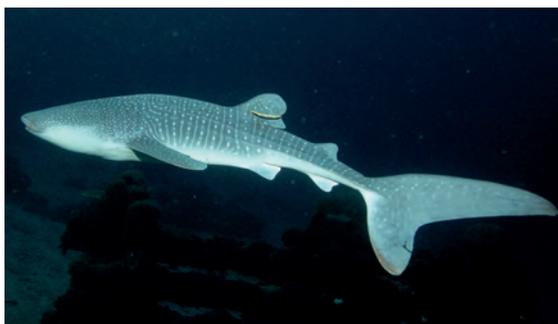
Teeth approximately actual size.

Teeth similar in upper and lower jaws, minute, hook-shaped.

Tooth counts: 300 or more rows on upper and lower jaws.

Description

An unmistakable shark with its unique checkerboard colour pattern of horizontal and vertical stripes with white or yellow spots, offset by a bluish to grey background colour, a broad flattened head, wide terminal mouth, long vertical gill slits, prominent longitudinal ridges on its back and large semi-crescent caudal fin.



© Hong-Ming Yu (AirFish Diving Center, Taiwan)

Colour

Unique checkerboard pattern consisting of prominent white or yellow spots between vertical and horizontal stripes offset by a background colour that ranges from dark grey to bluish or brown above, becoming white below.

Size

Males mature: 800–900cm.
Females mature: about 1000cm.
Maximum size: 1800cm.
Birth size: 55–65cm.



Rhincodon typus

Checkerboard patterning

5 Gills

Anal fin

SHARK

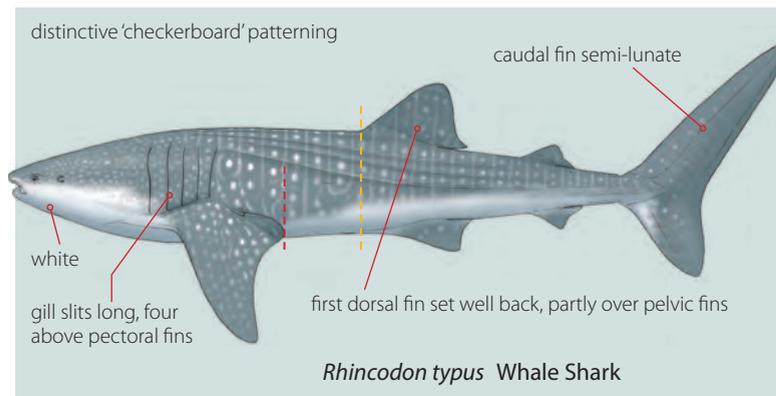
69

SIMILAR SPECIES

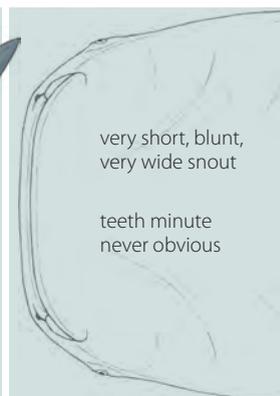
A giant shark, to over 10m total length, with prominent keels along sides of body; large terminal mouth, broad, square-shaped head with very large

gill openings that do not extend over head or across throat; prominent checkerboard patterned body colour.

Gill slits, snout coloration, first dorsal and caudal fins



Ventral view of head



Second dorsal and anal fins

