New recreational fishing management arrangements for dogfish (deep water sharks) to assist with rebuilding Harrisson's and Southern Dogfish populations

Frequently Asked Questions

What are dogfish and where do they occur?

Dogfish are a group of deepwater shark species found in most of the world's oceans. They are small to medium sized sharks and tend to stay in cooler, lower depths most of the time. In NSW they inhabit the outer-continental shelf and slope depths.

Southern Dogfish occur on the upper continental slope in NSW waters north to at least Crowdy Head and at depths of between 250 and 800m. Harrisson's Dogfish also occur on the upper slope in NSW waters at depths of between 250 and 1000m. The maximum length of Harrisson's and Southern Dogfish is about 110cm. Other dogfish species grow to a smaller or similar maximum length and occur on the outer shelf and upper slope in NSW waters in depths between 150 and 650m.

Many Australian dogfishes are believed to be endemic (i.e. found only in Australian waters), and their slow growth rates, low reproductive rates and extended time to reach sexual maturity make them particularly susceptible to over-exploitation. In particular, both Harrisson's Dogfish (*C. harrissoni*) and Southern Dogfish (*C. zeehaani*) have been considerably depleted in their range of distribution.

Dogfish species are not commonly targeted by most recreational fishers but may occasionally be caught as a bycatch when fishers are targeting other more highly valued species such as Banded Rockcod (Bar Cod), Blue-eye Trevalla (Blue-eye Cod) and Gemfish. Most dogfish are thought to be released by recreational fishers as incidental bycatch.

What are the new fishing rules for dogfish in NSW?

A fishing closure has been implemented to prohibit the take of both Harrisson's and Southern Dogfish (i.e. zero bag and possession limit) by recreational and commercial fishers. The recreational bag limit for all other dogfish and gulper shark species has been reduced from five to a combined bag limit of two. Some additional commercial fishing area closures restricting certain fishing methods have also been implemented.

Why are these new fishing rules for dogfish being implemented?

Studies by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) have indicated that the east coast populations of Harrisson's and Southern Dogfish are at only 10% of their unfished biomass. Much of the depletion was caused over several decades by the Commonwealth Trawl Sector where the majority of trawl activity was within the core depth ranges of these species.

Most of the remnant populations are now found on the seamounts off the NSW coast, and in NSW-managed waters between Wollongong and Port Macquarie.

Harrisson's, Southern and Endeavour Dogfish were previously nominated for listing under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). A number of targeted commercial fishing area closures were subsequently implemented by the Australian Fisheries Management Authority (AFMA) in 2010 in waters where it has jurisdiction as part of its 'Upper-slope dogfish management strategy' to assist with the rebuilding of dogfish populations. NSW DPI also implemented a complementary closure to certain commercial fishing methods in an area off Sydney in April 2011.

However later in 2011 the Commonwealth Department of Sustainability, Environment, Water, Populations and Communities reviewed the area closures in place and considered these closures were not sufficient to ensure the recovery of the relevant dogfish species. Since that time, the Commonwealth Environment Minister decided not to list the Endeavour Dogfish as a threatened species, however additional protection measures are still needed to address the significant depletion of Harrisson's and Southern Dogfish populations.

Both NSW DPI and the Australian Fisheries Management Authority (AFMA) have been working together on collaborative strategies to address the risks posed by each jurisdiction's fisheries on Harrisson's and Southern Dogfish. The AFMA Upper-Slope Dogfish Management Strategy has since been further strengthened to promote the recovery of Harrisson's and Southern Dogfish. While the new strategy relates primarily to Harrisson's and Southern Dogfish, it also provides additional protection to Endeavour Dogfish and Greeneye Spurdogs.

The new fishing rules as part of the NSW strategy prohibit the take of Harrisson's and Southern Dogfish by commercial and recreational fishers. Some additional commercial fishing area closures restricting certain fishing methods have also been implemented (for more detail go to: www.dpi.nsw.gov.au).

The strategy also takes account of the inherent vulnerability of other dogfish species given their general biology and life history (e.g. slow growth rate, low fecundity, etc.). To provide additional protection for these other dogfish species, the recreational bag limit for these species has also been reduced from five to a combined limit of two.

Were any alternative arrangements considered?

Yes. One such option proposed by the Commonwealth included a series of deep water area fishing closures (e.g. one large area was near Browns Mountain off Sydney). These proposed closures areas would have involved zero take for all dogfish species but also all other fish, including highly desirable species such as Banded Rockcod (Bar Cod), Blue-eye Trevalla (Blue-eye Cod) and Gemfish. This proposal would have had significant impacts on recreational and charter fishing in NSW.

A zero take for Harrisson's Dogfish and Southern Dogfish and a reduced combined bag limit for other dogfish species were considered the most suitable arrangement for recreational fishers, which would impact on the activities of few anglers.

However, anglers need to take a keen interest in this issue and do their part by learning how to identify the different dogfish species, move away from an area if you

incidentally catch a Harrisson's or Southern Dogfish while fishing for other species, and to release any such individuals taken immediately and with the greatest care possible.

What do these dogfish species look like?

Dogfish species guides are included at the end of this document. The primary distinguishing features of each species are highlighted in orange. To obtain water-resistant copies of these guides, please contact NSW DPI on (02) 9741 4712 or email: fisheries.recoveryprograms@dpi.nsw.gov.au.

These guides have been extracted from the NSW DPI publication titled 'Identifying sharks and rays.' The full publication can be found at: www.dpi.nsw.gov.au/fisheries/commercial/fisheries/otl-fishery/identifying-sharks-and-rays.

What if I am unsure about identifying different dogfish species?

If you catch a dogfish and are unsure about what species you have caught, DPI encourages you release it carefully and immediately.

Some tips on how to maximise a fish's survival when catching and releasing fish include:

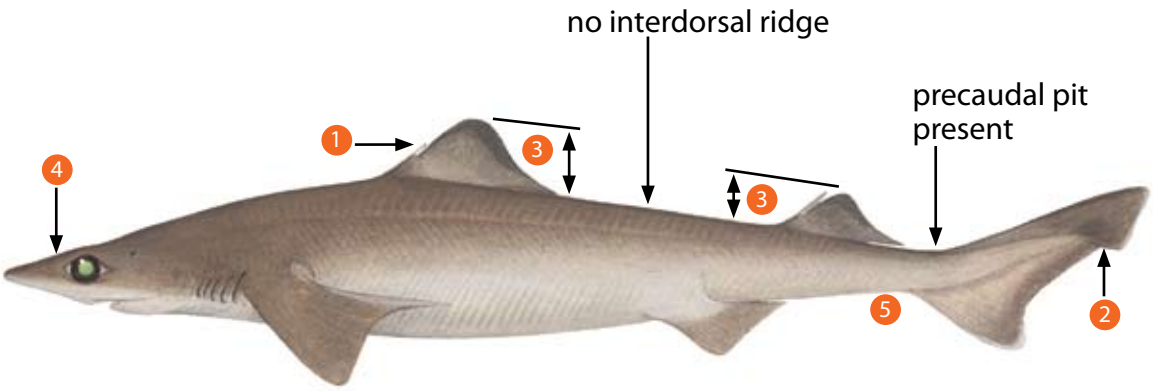
- If the fish is hooked deeply, cut the line as close as possible to the fish's mouth rather than removing the hook. Remove hooks from mouth-hooked fish.
- Minimise the length of time the fish is out of the water
- Ideally unhook fish while it is still in the water
- Try to remove hooks and release fish as quickly as possible
- The use of needle-nosed pliers or hook retrieving devices can greatly reduce time spent unhooking
- Use methods and rigs that increase the frequency of mouth hooked fish
- Use fish-friendly landing nets with soft knotless mesh. Knotted landing nets may damage the fish's scales, skin, eyes and fins
- Handle fish firmly and carefully. Avoid dropping fish onto the bottom of boats and other hard surfaces.
- Use wet hands or wet gloves when handling fish to minimise damage to its skin.
- A smooth, wet surface or vinyl covered foam is the most suitable surface to place fish on in order to remove hooks. Remember, many surfaces, especially metal, can become very hot in the sun.
- Do not hold fish by the gills or the eyes.
- Take care to revive fish upon release if they appear exhausted (struggling to hold themselves upright and/or unable to swim away)
- Gently hold or push the fish through the water so that it obtains a good flow of water over its gills. If there is any water current, hold the fish upright facing towards the current until it starts to show signs of recovery.

More information on catch and release can be found at: www.dpi.nsw.gov.au/fisheries/recreational/info/catch-and-release

Southern dogfish

(Centrophorus zeehaani)

NSW DPI code: SHK-21



Distinguishing features

- No interdorsal ridge
- No distinct black tips on fins

1. Prominent spines extending from 1st and 2nd dorsal fin origins
2. Trailing edge of tail with notch (or flap) – i.e. not smoothly rounded
3. Height of 2nd dorsal fin at least two-thirds that of the 1st dorsal fin
4. Small white spot in the middle of the upper surface of the snout

- Distance from snout tip to front corner of eye equal or slightly less than distance from front corner of eye to the spiracle

5. No anal fin

Colouration

- Upper body light brown in adults, grey in juveniles; pale underside
- Tips and trailing edges of dorsal fins can be dark, but much less so in adults
- Usually a small white spot in the middle of the upper surface of the snout

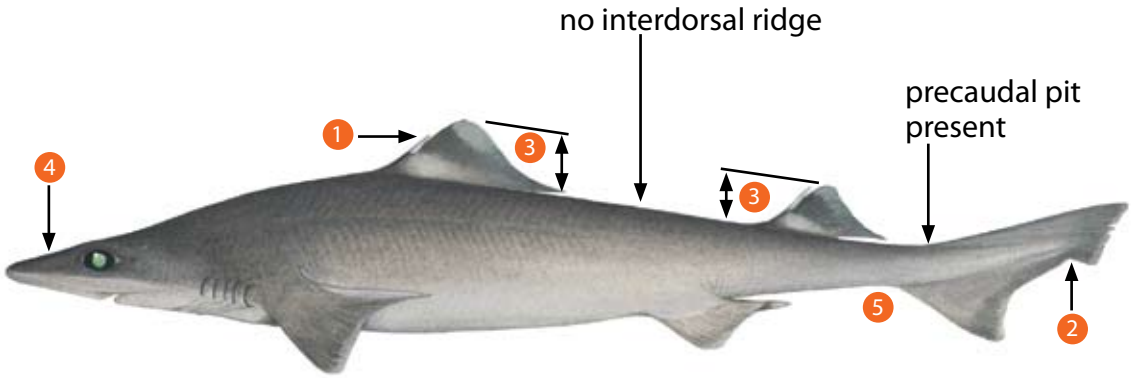
Size & Distribution

- Born ~ 40 cm; males max. ~ 90 cm; females max. ~110 cm
- Demersal on upper slope in NSW waters north to at least Crowdy Head, and at depths of between 250 and 800 m

Harrisson's dogfish

(Centrophorus harrissoni)

NSW DPI code: SHK-22



Distinguishing features

- No interdorsal ridge
- No distinct black tips on fins

1. Prominent spines extending from 1st and 2nd dorsal fin origins
2. Trailing edge of tail with notch (or flap) – i.e. not smoothly rounded
3. Height of 2nd dorsal fin at least two-thirds that of the 1st dorsal fin
4. No small white spot in middle of upper surface of snout

- Distance from the snout tip to the front corner of eye noticeably greater (about 1.4 x) than the distance from front corner of the eye to the spiracle

5. No anal fin

Colouration

- Light-greyish or brownish upper body; pale underside
- Tail mostly greyish with a slightly darker posterior half of tail-flaps
- Upper front of dorsal fins with dark patch; less obvious in adults
- Often a dark smudge around the bases of dorsal fins

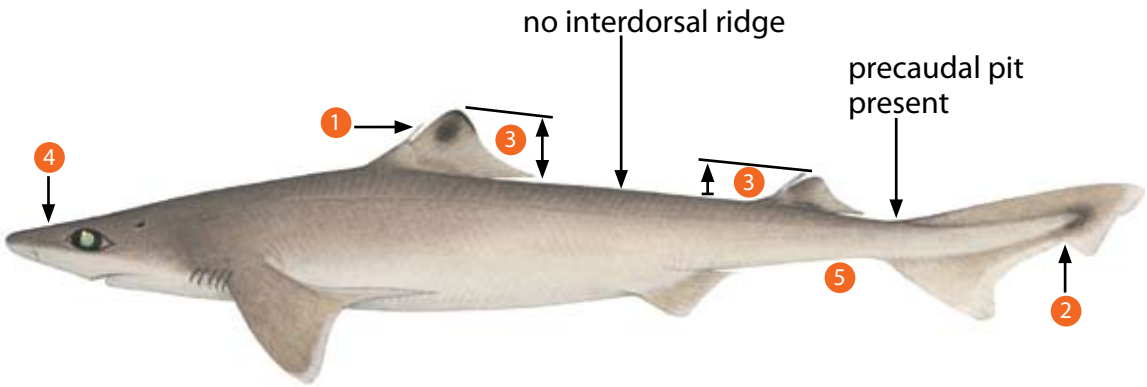
Size & Distribution

- Born ~ 40 cm; males max. ~ 95 cm; females max. ~ 110 cm.
- Demersal on upper slope in NSW waters north to at least Coffs Harbour, and at depths of between 250 and 1000 m

Endeavour dogfish

(Centrophorus moluccensis)

NSW DPI code: SHK-23



Distinguishing features

- No interdorsal ridge
- No distinct black tips on fins

1. Prominent spines extending from 1st and 2nd dorsal fin origins
2. Trailing edge of tail with notch (or flap) – i.e. not smoothly rounded
3. Height of 2nd dorsal fin about half that of the 1st dorsal fin
4. No small white spot in middle of upper surface of snout -
5. No anal fin -

Colouration

- Light-greyish or brownish upper body; pale underside
- Tail mostly greyish with a pale trailing edge
- Smaller individuals with dark blotches near the tip of the 1st dorsal fin

Size & Distribution

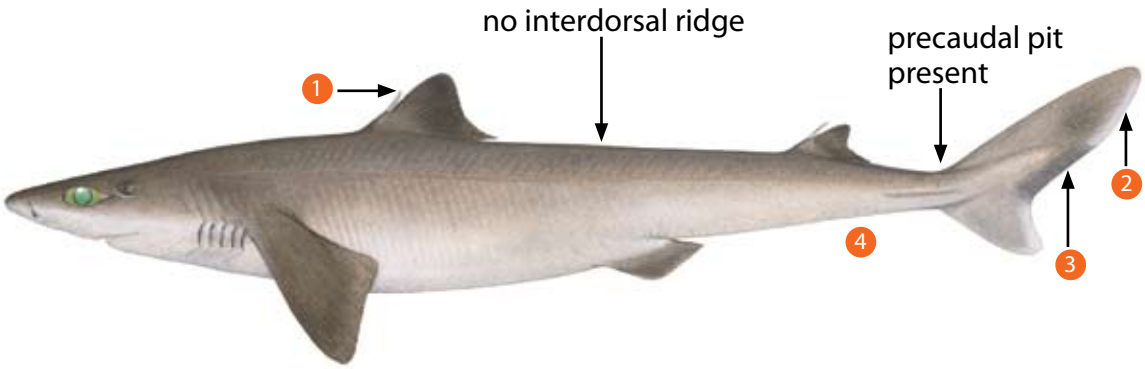
- Born ~ 40 cm; males max. ~ 85 cm; females max. ~ 95 cm
- Demersal on outer shelf and upper slope in NSW waters at between 150 and 650 m depth

Dark-tailed dogfishes

NSW DPI code: SHK-19

Greeneye dogfish - *Squalus choloroculus*
Northern greeneye dogfish - *Squalus montalbani*
Eastern longnose dogfish - *Squalus grahami*

This example:
Northern greeneye dogfish



Distinguishing features

- No interdorsal ridge
- No distinct black tips on fins

1. Prominent spines extending from 1st and 2nd dorsal fin origins
2. Trailing edge of tail smoothly rounded and without sub-apical notch
3. Obvious but smudgy dark patch on the tail and at the centre of its trailing edge
4. Slender-bodied shark; anal fin absent

- Dorsal fins grey and commonly with slightly darker tip and trailing edge

Colouration

- Dark grey upper body; pale to white underside
- Tail mostly greyish with a broad darkish area along the centre the trailing edge
- Tips of upper and lower lobes of tail whitish

Size & Distribution

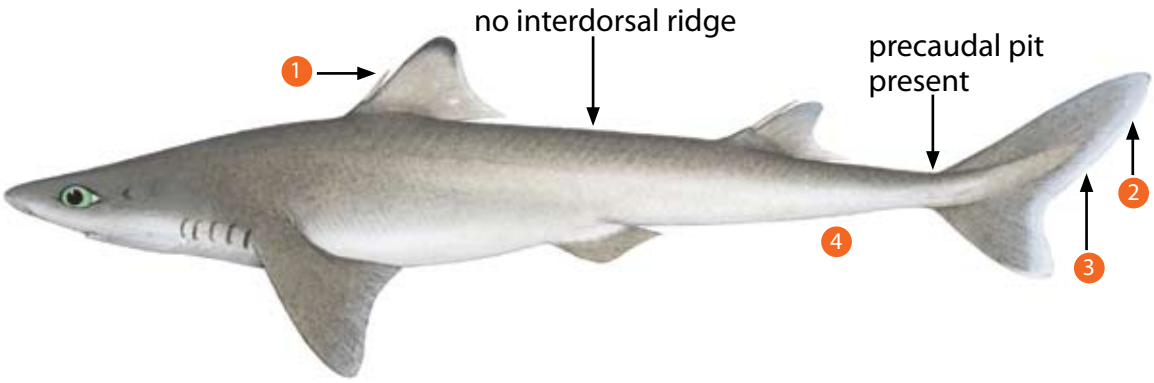
- Born ~ 20 cm; max. ~ 110 cm
- Demersal on outer shelf and upper slope in NSW waters at between 150 and 600 m depth

White-tailed dogfishes

Spiky dogfish - *Squalus megalops*
Eastern highfin dogfish - *Squalus albifrons*

NSW DPI code: SHK-20

This example:
Spiky dogfish



Distinguishing features

- No interdorsal ridge
- No distinct black tips on fins

1. Prominent spines extending from 1st and 2nd dorsal fin origins
2. Trailing edge of tail smoothly rounded and without sub-apical notch
3. No dark patch on the tail – entire trailing edge of tail pale or white
4. Slender-bodied shark; anal fin absent

- Upper margins of dorsal fins may be slightly dark

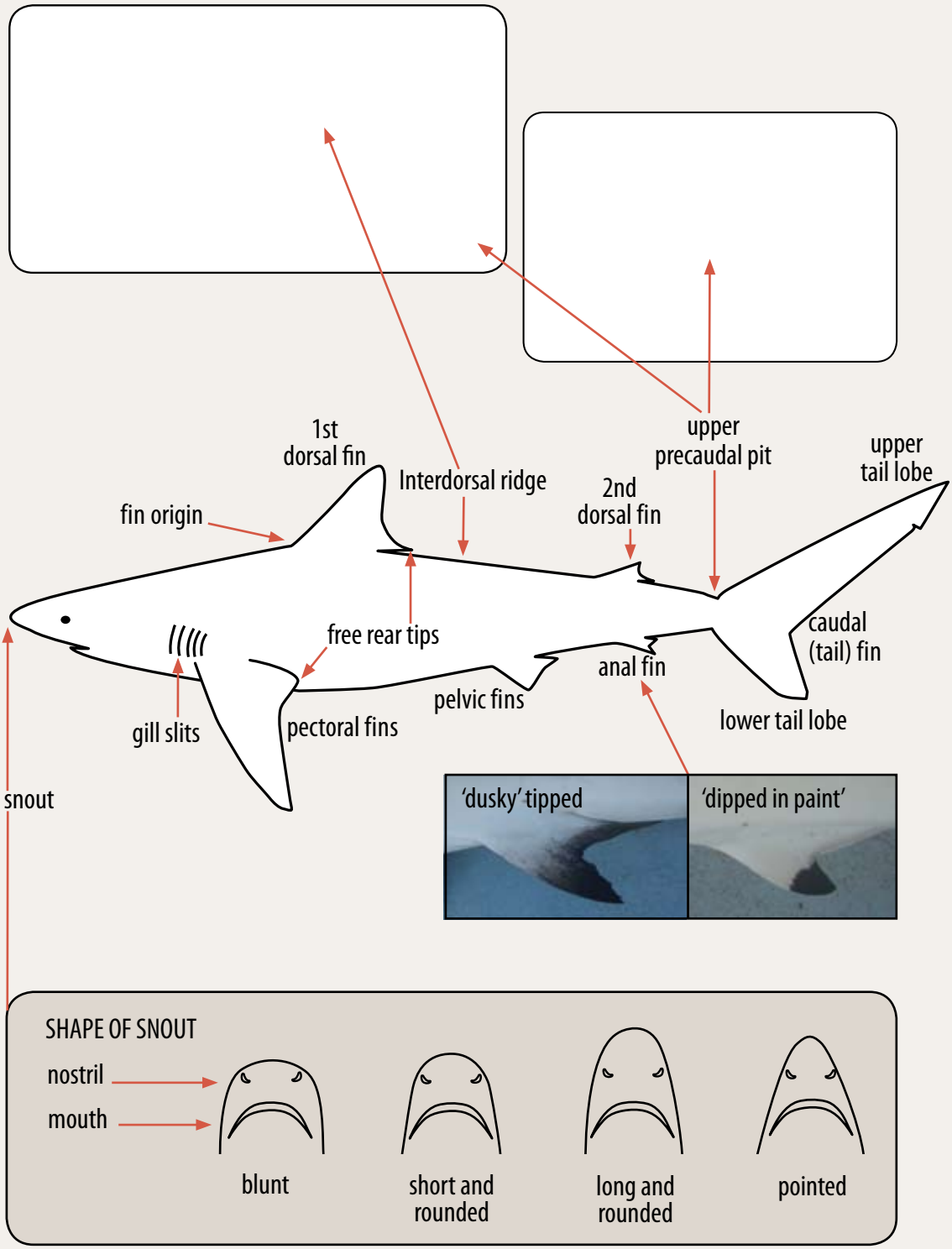
Colouration

- Pale-greyish to brownish upper body; pale/white underside
- Tail mostly greyish with a white or very pale trailing edge

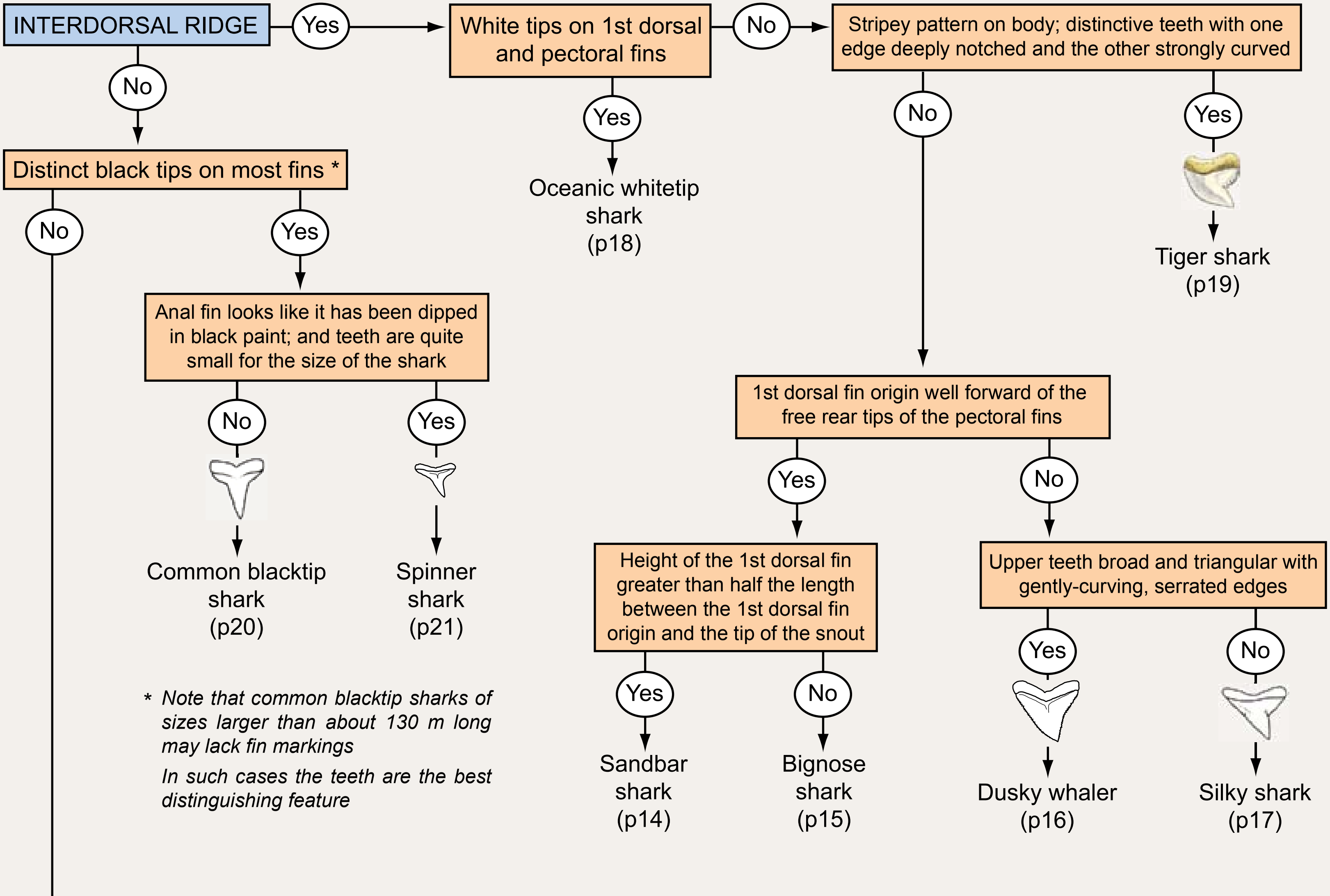
Size & Distribution

- Born ~ 20 cm; max. ~ 90 cm
- Demersal on outer shelf and upper slope in NSW waters at between 150 and 400 m depth

Identifying parts of the shark

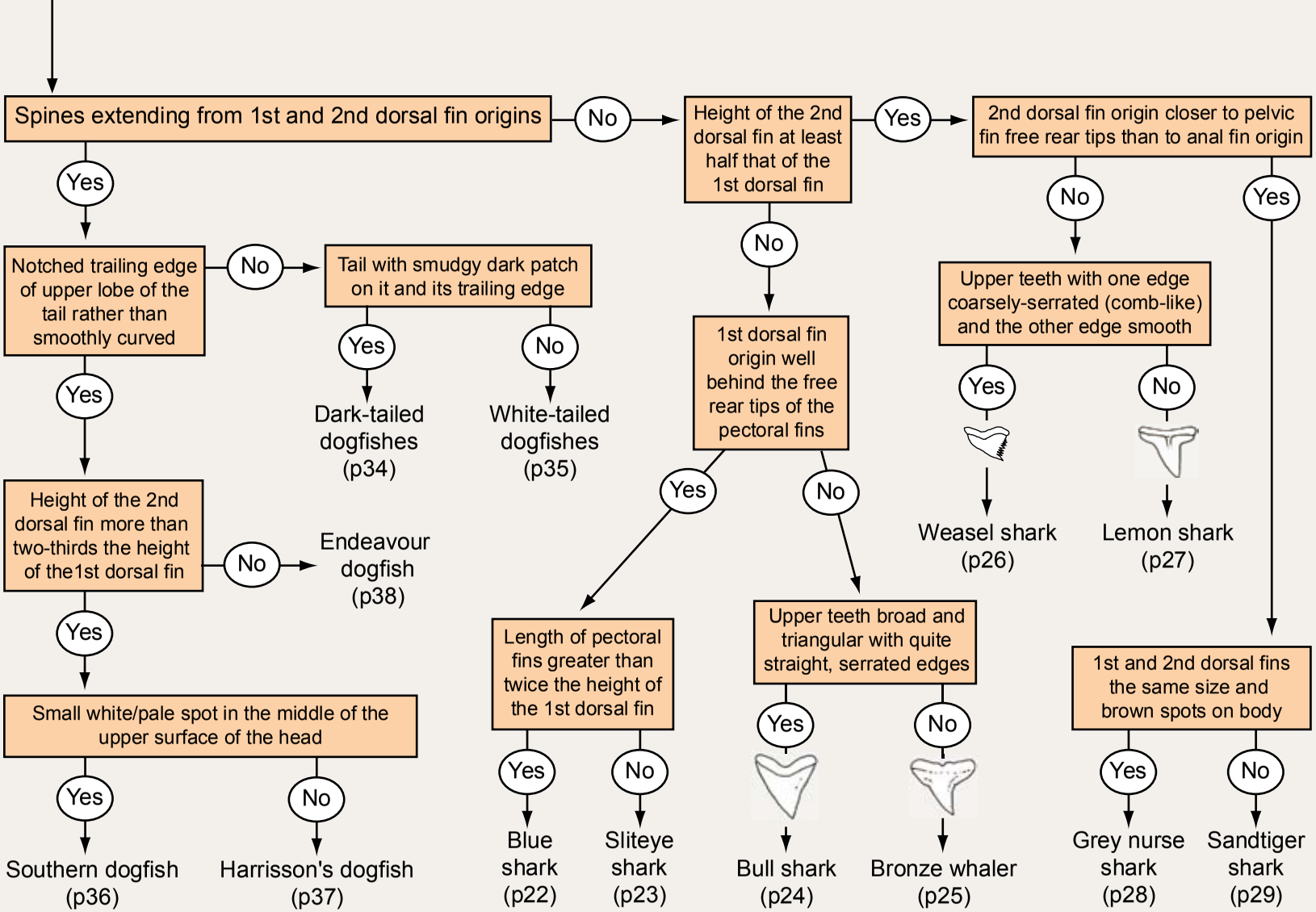


KEY 1: Whaler sharks and other sharks of similar appearance to whalers – upper precaudal pit present



* *Note that common blacktip sharks of sizes larger than about 130 m long may lack fin markings*

In such cases the teeth are the best distinguishing feature



KEY 1 continued