

Fisheries science update – April 2022

Shark depredation



Recreational, charter and commercial fishers in Western Australia (WA) are reporting significant increases in shark depredation (bite-offs), particularly in the Gascoyne and Pilbara regions.

Shark depredation is an issue across Northern Australia, with similar reports in Queensland and the Northern Territory. Managing shark depredation is complex, and WA is leading the country in research to better inform our management decisions.

Recent research by the Department of Primary Industries and Regional Development's (DPIRD) has found that:

- a range of shark species are responsible for bite-offs, including blacktip, dusky, milk, pigeye, sandbar and tiger sharks;
- the probability of sharks taking fish is reduced by 65 per cent when using deterrents;
- sharks arrive within 15-30 minutes of fishing commencing, so moving spots helps decrease shark bite-offs; and
- depredation rates are higher in areas where more people are fishing, for example, close to boat ramps.

What is shark depredation?

- Shark depredation (bite-offs) occurs when a shark partially or completely consumes a fish caught by fishing gear before it can be landed.
- Shark bite-offs can have detrimental economic and social impacts on commercial, charter and recreational fishers across WA.
- Developing mitigation measures against shark bite-offs is complex as a number of factors are at play.



As a commercial, charter and recreational fisher there are ways you can mitigate shark bite-offs including moving fishing spots, using deterrent devices and avoiding known hotspots.

What shark depredation research has been done in WA?

DPIRD has participated in a number of science projects to better understand and address shark depredation across the State. The science shows that:

- Shark depredation occurred on approximately 40% of recreational fishing trips in the Ningaloo Marine Park and Exmouth Gulf. Depredation rates were higher in areas with greater fishing activity such as in close proximity to boat ramps (Mitchell et al. 2018).
- Charter fishers lost 9% of fish caught to depredation in the Gascoyne Bioregion (Mitchell et al. 2019).
- 52% of surveyed commercial, charter and recreational fishers encountered depredation.

Losing fish to depredation below or at the surface was highest for pelagic or demersal species while line fishing in the North Coast and Gascoyne Bioregions (Ryan et al. 2019).

- DNA swabs of bite marks in fish shows blacktip, dusky, milk, pigeye, sandbar, and tiger sharks are responsible for depredation in the Gascoyne and West Coast Bioregions (Fotadar et al. 2019).

DPIRD manages shark depredation in line with the latest research and technology. It's important to remember that mitigation measures need to be considered in the context of recovering shark populations and sustainable use of WA's aquatic resources.



DPIRD researchers heading out to study deterrent devices and their effectiveness.

What was the Recreational Fishing Initiatives Fund (RFIF) project?

- DPIRD recently completed a RFIF project 'Testing deterrents to mitigate shark depredation in line fisheries across WA'.
- This was a world-first study to independently test the effectiveness of three shark deterrent devices: magnetic (Sharkbanz); electronic (Ocean Guardian Fish01); and acoustic (SharkStopper).
- Underwater cameras attached to fishing lines were used to assess how sharks reacted to devices during fishing.
- A total of 180 hours of video footage was taken and analysed at locations from Exmouth to the Montebello Islands.
- 1,340 charter and recreational fishers were also surveyed to understand how they mitigate shark depredation.

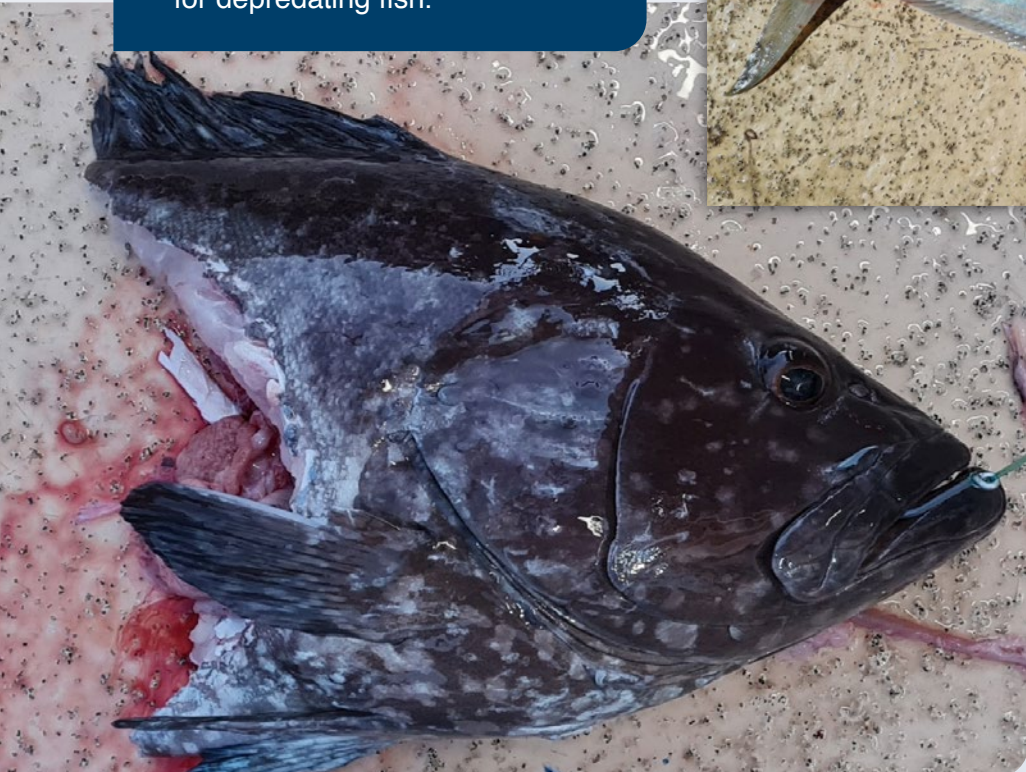
Anecdotal findings:

- Species involved in depredation included blacktip, dusky, grey reef, pigeye, sandbar, sicklefin lemon and silvertip sharks.
- Competition between sharks may reduce effectiveness of deterrents.
- Large cods were also responsible for depredating fish.

What did the RFIF project find?

- The most common way fishers avoid or minimise depredation is by moving spots.
- Emperors, snapper, trevally and cod were commonly depredated fish.
- The study found that:
 - Deterrents do not stop sharks entering the fishing area.
 - Deterrents reduce the likelihood of depredation occurring by 65 per cent and increase the chance of landing fish that are hooked.
 - Depredation becomes increasingly worse over time if you remain at a fishing spot, whether a deterrent is used or not.
 - Deterrents do not prevent sharks arriving at a fishing spot any later than when not using a deterrent.
 - Deterrents provide more time to get fish to the surface.

The shark deterrent project was made possible by the WA Government's Recreational Fishing Initiatives Fund.



Tips and tricks to avoid shark depredation

Increasing reports of depredation is a sign of recovering shark stocks. Some ways you can mitigate bite-offs:

- If depredation starts to occur, move fishing spots immediately. Science has shown once it starts it'll only get worse.
- Consider using deterrent devices to increase your probability of landing a fish.
- Avoid areas known to be depredation hotspots. Sharks have been known to 'learn' where to get a feed.
- Use lures and jigs instead of bait.
- Avoid catch and release fishing.
- Don't clean fish at sea, bring your fish waste back to land for composting.

Where to next?

Future research opportunities include:

- Testing deterrent effectiveness for pelagic fishing and fishing in deep water.
- Collecting more refined data on shark depredation rates.
- Investigating if depredation alters sharks eating habits.

Management:

- DPIRD is working with other Australian jurisdictions on new research opportunities and ways to manage shark depredation.
- DPIRD continues to work with Recfishwest and WAFIC to improve education and community understanding of shark depredation.



How are shark stocks managed in Western Australia?

DPIRD works with the commercial and recreational fishing sectors, conservation organisations and other jurisdictions to sustainably manage WA's commercial shark fisheries.

Sustainable management of WA's dusky and sandbar sharks relies on fishing juveniles in the temperate waters of the West Coast and South Coast Bioregions and protecting adult breeding populations that migrate to the State's north.

The Temperate Shark Resource includes over 50 species of sharks and rays which have been in recovery since the mid-1990s when some of the key species were found to be over exploited. The current recovery strategy includes:

- large effort reductions in the commercial Temperate Shark Fisheries;
- the closure of most of the commercial Northern Shark Fisheries to protect adult breeding populations; and
- a maximum size limit for certain shark species to ensure vulnerable species are protected as adults.

Did you know?

- Recreational fishers can catch up to three sharks as part of their large pelagic finfish bag limit.
- There is a maximum size limit of 70 cm (inter dorsal fin length) for whaler sharks in the West Coast and South Coast Bioregions.



Did you know?

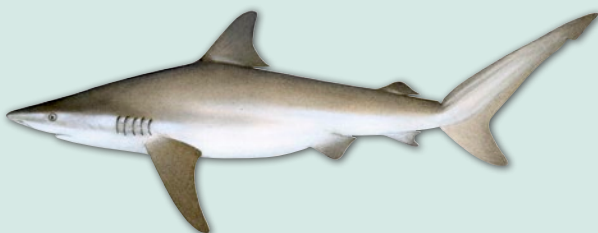
- The Temperate Shark Fisheries operate in the West Coast and South Coast Bioregions of WA.
- Commercial fishers mainly catch gummy, dusky, whiskery, and sandbar sharks.
- In 2018/19 commercial fishers landed 838 tonnes of sharks and rays, the majority of which is sold to local retailers, fish and chip shops and restaurants as a source of locally caught seafood.



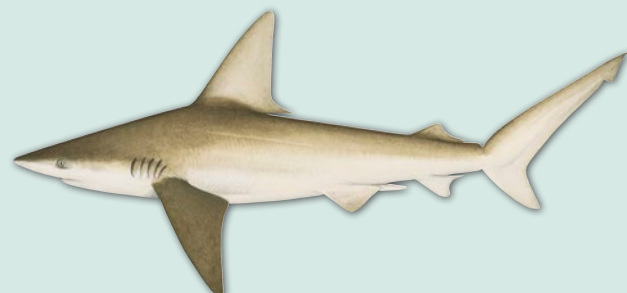
Whiskery shark
Furgaleus macki



Gummy shark
Mustelus antarcticus

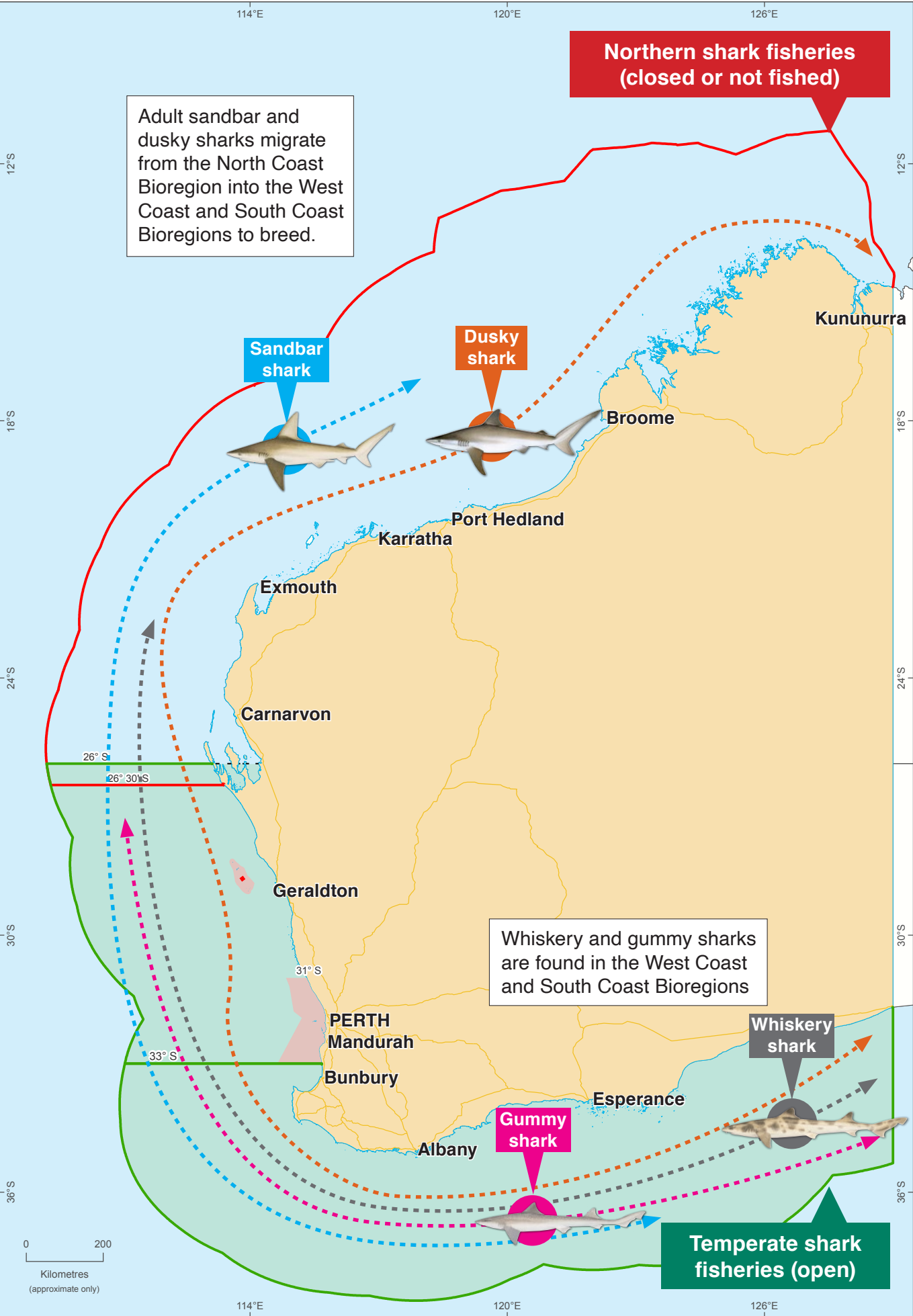


Dusky whaler shark
Carcharhinus obscurus



Sandbar shark
Carcharhinus plumbeus

Shark movement in Western Australia



References

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