

FACTSHEET

Greynurse Shark (*Carcharias taurus*)

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Photo by Justin Gilligan

Introduction

Greynurse Sharks are a large shark native to subtropical to cool temperate waters. Once abundant, their reduced populations are now restricted to Australia, the east coasts of North and South America and South Africa. In Australia there are two separate and genetically-distinct populations on the east and west coasts.

Despite their fierce appearance, Greynurse Sharks are not a threat to divers or swimmers unless provoked. Their placid nature, combined with their occupation of shallow inshore reef areas, has allowed diving with Greynurse Sharks to become the focus of an ecotourism industry.

Concern about the conservation status of Greynurse Sharks was raised in the 1980s, resulting in the species becoming protected in NSW in 1984. The population of Greynurse Sharks in NSW has declined to the point where they are now listed as a **critically endangered species** under the *Fisheries Management Act 1994*. The east coast population of Greynurse Sharks is also listed as a critically endangered species under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

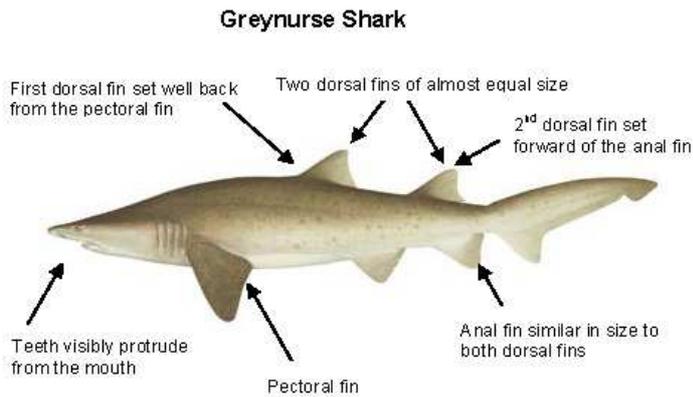
There are heavy penalties for harming, possessing, buying or selling Greynurse Sharks, or for harming their habitat. Special rules apply for fishing and diving in critical habitat sites (see 'Legal implications').

Description

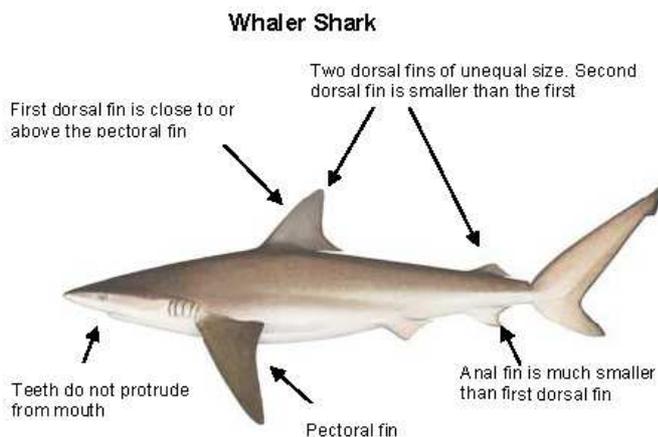
Greynurse Sharks have large, stout bodies that are tapered at each end. They have a short, pointed snout and small eyes. The upper surface of Greynurse Sharks is grey-brown or bronze coloured, and the underside is pale white.

Juveniles often have dark spots of varying sizes on the lower half of the body and the caudal (tail) fin. These spots fade as the shark becomes larger, but often persist on adults.

Greynurse Sharks have sometimes been confused with Whaler Sharks by fishers; however, there are key anatomical features that may be used to identify Greynurse Sharks. They have two distinctive large dorsal (top) fins of similar size. The first dorsal fin is set well back from the pectoral (side) fins situated behind the gill slits. The anal fin is similar in size to both dorsal fins. The mouth extends beyond the front of the eye, and the long awl-like teeth visibly protrude from the mouth. Greynurse Sharks are born around 1.0 m in length and grow to a maximum length of 3.2 m.



Grey Nurse Sharks are coloured grey-brown or bronze on the upper parts of their body, with a pale white underbelly. Brownish spots occur on the upper body and tail fin, and are most prominent in juveniles. They differ from whaler sharks in that their awl-like teeth visibly protrude from the mouth. The two dorsal fins and anal fin are of almost equal size, and the first dorsal fin is set well back from the pectoral fins. The second dorsal fin is set forward of the anal fin.



Whaler Sharks may be coloured blue, grey or bronze on the upper parts of their body, with a creamy white underbelly. They differ from Grey Nurse Sharks by having dorsal fins of unequal size, and teeth that do not protrude from the mouth. The first dorsal fin is much larger than the second dorsal fin, and is located above the posterior edge of the pectoral fin. The second dorsal fin is located directly above the anal fin, unlike that of the Grey Nurse Shark.

Comparison of Grey Nurse Sharks to Whaler Sharks

Habitat and ecology

- Grey Nurse Sharks are found predominantly in inshore coastal waters.
- They have been recorded at various depths, but spend almost 75 % of their time in waters less than 40 m in depth. On some occasions, individual sharks swim to deeper depths. The deepest depth recorded in NSW DPI tracking of Grey Nurse Sharks is 232 m.
- Grey Nurse Sharks congregate at a number of sites along the coast of NSW and southern Queensland. These sites have rocky reef with gravel or sand filled gutters, overhangs or caves and are termed aggregation sites.
- Aggregation sites that are occupied by larger numbers of Grey Nurse Sharks for many months in a year are referred to as key aggregation sites.
- When occupying aggregation sites, individuals spend most of their time in close proximity to the rocky reef, gutter or cave, but may undertake excursions of varying lengths of time away from the site. During these excursions individuals have been recorded swimming up to 1300 m away from the aggregation site.
- The duration of occupation of aggregation sites and the localised movements by individual sharks varies between sites and depends on gender, sexual maturity, and the stage in the reproductive cycle.
- Grey Nurse Sharks migrate between aggregation sites. In NSW, tagged sharks have been recorded moving over 800 km between sites in relatively short periods of time, and show site fidelity by returning to the same sites in consecutive years.
- The species is active during the day and at night, and feeds on a wide range of bony fishes, small sharks and rays.
- Mating occurs in spring, and pregnant females migrate north to southern Queensland where they spend about 6 months at aggregation sites away from sexually mature males.
- The pregnant females migrate south to NSW waters in winter and give birth in late winter and early spring at various sites.
- Grey Nurse Sharks reproduce very slowly and a sexually mature female produces a maximum of two pups every two years, with a 1 to 1 sex ratio, on average. This is due to their unusual

reproductive strategy that involves intra-uterine cannibalism.

- After mating, the female releases numerous eggs into her two uteri where they start to develop. By the time the embryos are 10 cm long they have a functioning set of jaws and teeth and begin eating their siblings within the same uterus. The intra-uterine cannibalistic phase ceases when only one developing embryo remains in each uterus. The 2 remaining embryos then continue their development by eating eggs ovulated by their mother.
- After a 9–12 month gestation period, the two pups are born at lengths of 1–1.2 m and each weighs about 8 kg.
- The mother then enters a 1-year resting phase, during which time she replenishes her energy reserves in readiness for the next breeding event.
- As a result of this two-yearly (biennial) reproductive cycle, Greynurse Sharks have a very low reproductive rate, and therefore a low potential for the population to recover from the currently estimated 1500 individuals.
- Recent Australian and international research indicates that sexual maturity is reached in about 7 years for males, and approximately 12 years for females, at respective lengths of around 2.1 m and 2.6 m.
- The late onset of sexual maturity and low reproductive rate makes the species extremely vulnerable to human-induced pressures.

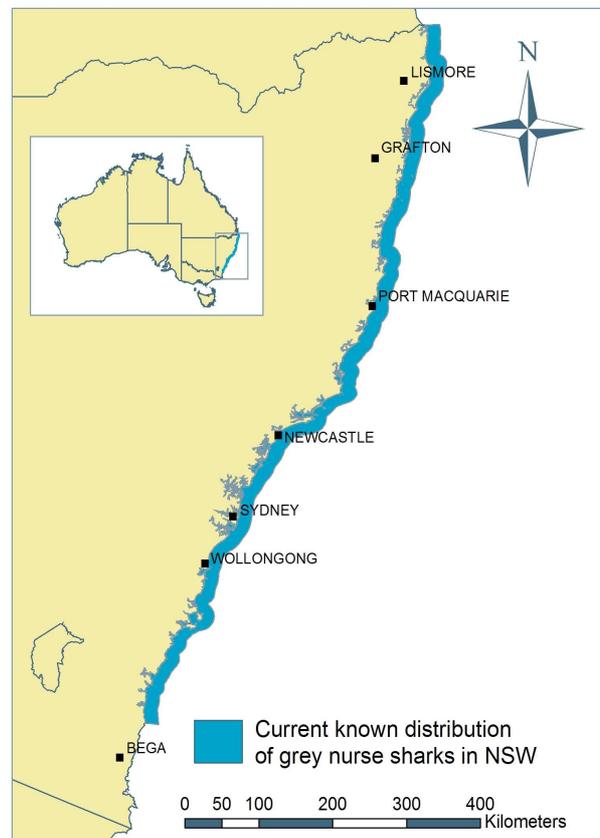
Why are Greynurse Sharks threatened?

- Hook and line fishing in areas important for the survival of threatened species has been identified as a key threatening process affecting Greynurse Sharks.
- Accidental hooking on commercial and recreational fishing gear can result in internal injuries and death.
- Historical declines in numbers due to targeted fishing and hunting.
- Capture in beach safety (shark) mesh nets.
- Illegal capture for sale of the fins.
- The species' very low potential for population recovery.

Conservation and recovery actions

- Maintain existing bans on taking Greynurse Sharks in NSW, Queensland and Commonwealth waters.
- Reduce the impact of beach safety (shark) meshing activities.

- Educate fishers on how to identify Greynurse Sharks and why reducing the impacts of fishing is so important.
- Reduce the risk of accidental hooking at critical habitat and key aggregation sites.
- Reduce diving impacts by complying with the national Code of Conduct for Diving with Greynurse Sharks.
- Reduce the impacts from NSW commercial fisheries identified as high risk to Greynurse Sharks including:
 - Mandatory use of circle hooks for all unattended line fishing methods (non-offset circle hooks in waters < 92 m), to reduce gut and oesophageal hooking;
 - Prohibiting wire trace on bottom setlines in all waters within 3 nautical miles of the coast, and within buffer zones of all Greynurse Shark critical habitats and key aggregation sites;
 - Mandatory reporting of threatened species interactions;
 - Implementing closures for high-risk ocean trap and line gear around critical habitat and key aggregation sites.
- Implement the Protected, Threatened and Pest Species Sighting Program: Report any sightings of the species on the NSW DPI 24-hour automated message-taking service by calling (02) 4916 3877.



Distribution of Greynurse Sharks in NSW

Review of protection measures

Recent scientific results have shown that some fishing methods such as fishing with artificial lures have a much lower risk of hooking Greynurse Sharks than fishing with bait. In 2011-2012, a major review of Greynurse Shark protection was undertaken in NSW. The review concluded with new fishing and diving rules at several critical habitat and key aggregation sites. For full details see www.dpi.nsw.gov.au

Legal implications

It is illegal to catch and keep, buy, sell, possess or harm Greynurse Sharks (or any other threatened species in NSW) without a specific permit, licence, or other appropriate approval – significant penalties apply. For critically endangered species, these penalties can include fines of up to \$220,000 and up to two years in prison. There can also be significant penalties for causing damage to the habitat or critical habitat of a threatened species without approval.

Special rules apply at Greynurse Shark critical habitat and key aggregation sites at:

- Julian Rocks near Byron Bay
- North and South Solitary Island near Coffs Harbour
- Green Island and Fish Rock (mid-north coast)
- Mermaid Reef (mid-north coast)
- The Pinnacle near Forster
- Big Seal and Little Seal at Seal Rocks
- Little Broughton Island near Port Stephens
- Magic Point near Maroubra
- The Tollgate Islands at Batemans Bay
- Montague Island near Narooma

For more information on the location of these sites, or for fishing rules, check with your local NSW DPI office or website at www.dpi.nsw.gov.au/fisheries

SCUBA divers should also comply with the National Code of Conduct for Diving with Greynurse Sharks. Significant penalties apply for interfering with Greynurse Sharks, including harassing, chasing, tagging, marking, feeding or using shark repelling devices.

The impacts of developments or activities that require consent or approval in accordance with the

Environmental Planning and Assessment Act 1979 must be assessed and considered by consent or determining authorities. Where such actions are likely to result in a significant impact on a threatened species or its habitat, a detailed species impact statement must be prepared. A species impact statement is mandatory to assess the impact of any development or activity within critical habitat that requires approval under the *Environmental Planning and Assessment Act 1979*.

Strategies to be adopted for promoting the recovery of Greynurse Sharks are set out in the NSW DPI Priorities Action Statement. For full details see www.dpi.nsw.gov.au

Bibliography and further reading

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Otway NM, Parker PC 2000. *The biology, ecology, distribution and abundance, and identification of marine protected areas for the conservation of threatened Grey Nurse Sharks in south east Australian waters*, NSW Fisheries Final Report Series No. 19, NSW Fisheries, Sydney, Australia, 132 pp.

For further information

See the NSW DPI website: www.dpi.nsw.gov.au

Contact the NSW DPI Threatened Species Unit:
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