

# Great Hammerhead Shark

## *Sphyrna mokarran*

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Great Hammerhead Shark. Photo: Frederic Buyle

### Introduction

The Great Hammerhead Shark is the largest species of hammerhead in the world. The Great Hammerhead has a circumglobal distribution between the latitudes of 40°N and 35°S. They are a nomadic, generally solitary and highly migratory species that ranges in tropical and warm temperate seas. They are found throughout the seas around northern Australia and have been recorded occurring as far south as Sydney (34°S).

Globally hammerhead sharks have been targeted for their meat and valuable fins and have suffered serious declines in abundance in many geographic regions around the world.

The Great Hammerhead Shark is listed as a **vulnerable species** in NSW. Heavy penalties exist for harming, possessing, buying or selling Great Hammerhead Sharks, or for harming their habitat (see 'Legal implications').

### Description

Hammerhead sharks can be easily recognized by their unique hammer-shaped head; called a 'cephalofoil'. The exact purpose of the cephalofoil is debated with various theories proposed that it provides hydrodynamic lift, improves vision and manoeuvrability, increases the area and spatial arrangement of sensory organs and can be used for prey manipulation.

The Great Hammerhead has indentations at the centre and either end of the frontal edge of the head. The eyes are positioned at either end of the hammer and the mouth is situated on the underside.

The distinctive head is equipped with highly specialized sensory organs (called ampullae of Lorenzini) which assist in sensing weak electrical emissions omitted by their prey.



*Adult and juvenile Great Hammerheads – note the tall sickle shaped dorsal fin, and rectangular head.  
Photo: Alastair Harry, Fishing & Fisheries Research Centre, James Cook University*

The Great Hammerhead is approximately 50 - 70 cm at birth and attains a maximum length of 6 m although they are more typically recorded at around 4.5 m in Australian waters.

Globally there are nine species of hammerhead sharks, with three species occurring in NSW waters; the Smooth, the Scalloped and the Great Hammerhead Sharks.

While hammerhead sharks are immediately recognisable, it can be difficult to distinguish between species. The Great Hammerhead can be identified from other hammerheads by its relatively straight head profile (as opposed to the strongly arched profiles of Smooth and Scalloped Hammerheads) and the slight indentations on the front margin of its rectangular head (as opposed to the distinctive scalloped indentation found in the centre of the front margin of the Scalloped Hammerhead and the more pronounced notches found on the outer edges of the front margin in Scalloped and Smooth Hammerheads).

The Great Hammerhead has a slender tapered body, which is bronze-pale brown on top, fading to pale beneath but attains a much larger size (up to 6 m) than either the Smooth or Scalloped hammerheads (approx 3.5 m maximum). The Great Hammerhead possesses a tall, distinct and strongly falcate (sickle-shaped) first dorsal fin, with a relatively tall second dorsal fin, and the rear margin of the pelvic fin is strongly concave.

The keen eye will also notice that the height of the second dorsal fin of Great Hammerheads is equal to, or greater than the height of their anal fin, while the reverse situation applies in Smooth and Scalloped Hammerheads.

The species can also be differentiated by the presence of triangular and highly serrated teeth and by the absence of fin markings (Smooth and Scalloped Hammerheads have weakly serrated or smooth teeth and dusky colouring beneath the tips of their pectoral fins).

## Habitat and ecology

The Great Hammerhead is a coastal-pelagic and semi-oceanic species, occurring along coastlines, continental shelves and adjacent drop-offs to about 80 m depth.

In NSW waters Great Hammerheads are most likely to occur north of Sydney and mainly during the warmer months.

The species is typically nomadic in its movements compared to other hammerheads, and migrates to cooler waters in the summer months.

The diet of the Great Hammerhead Shark consists of fish, other sharks, rays, crustaceans, and cephalopods (squid, octopus and cuttlefish). The presence of many demersal species in stomach contents suggests Great Hammerheads are bottom feeders.

In temperate waters females reach sexual maturity at approximately 2.3 m and 8 - 9 years of age. The Great Hammerhead gives birth to 65 cm live young and produce litters of 6 - 33 pups after a gestation period of 11 months. Pups are born in summer between December and January. Females only reproduce every second year, increasing the species vulnerability to population decline.

Females can live to 39 years and males over 31 years old have been recorded.



*Great Hammerheads are usually solitary. Other species of hammerheads in NSW can form schools.  
Photo: Alastair Harry, Fishing & Fisheries Research Centre, James Cook University*

## Hammerhead Sharks

### 1. Scalloped Hammerhead

Medium to large size (up to 3m). Hammer broadly arched and narrow, with notches at either end.

### 2. Great Hammerhead

Grows very large (over 5m). Tall and distinctive sail-like dorsal fin. Hammer straight and wide. Rear edge of pelvic fin strongly concave.



Comparison of Scalloped and Great Hammerhead Sharks.  
Photos and comparison by Alastair Harry, Fishing & Fisheries Research Centre, James Cook University

## Why is the Great Hammerhead Shark threatened?

- Commercial, recreational and shark meshing bather protection fisheries are the primary threat to the Great Hammerhead.
- Great Hammerheads are generally regarded as being a solitary animal, and are unlikely to be abundant wherever they occur.
- Quantifying historical trends in mortality of Great Hammerheads across commercial, recreational and bather protection fisheries is difficult as most hammerhead landings have not been identified to species level due to difficulties with species identification.
- Great Hammerheads have low fecundity as a result of relatively slow growth rates, late onset of sexual maturity and a biennial reproductive cycle; reducing the species recovery potential.
- As a migratory species, Great Hammerheads are subject to fishing pressure in a range of jurisdictions and are targeted for their large, high value fins in some jurisdictions.

## Conservation and recovery actions

- Conduct research into the distribution, biology and ecology of the species.
- Manage fishing and the NSW Shark Meshing (Bather Protection) Program activities to mitigate impacts on the species.
- Develop cooperative management and research partnerships with other jurisdictions to ensure sustainable management of Great Hammerheads across jurisdictions.
- Develop educational and advisory materials to improve species identification of Great Hammerheads and to raise community awareness of their threatened status.
- Implement the Commercial Fisheries Threatened and Protected Species Interaction Reporting arrangements.
- Develop advisory materials on the best ways to release any incidentally caught Great Hammerheads with least possible harm.
- **Report any sightings of the species on the NSW DPI 24 hour automated message-taking service by calling (02) 4916 3877.**

## Legal implications

It is illegal to catch and keep, buy, sell, possess or harm the Great Hammerhead Shark (or any other threatened species in NSW) without a specific permit, licence or other appropriate approval, and significant penalties apply. For vulnerable species these penalties can include fines of up to \$55,000 and up to 1 year in prison.

There can also be significant penalties for causing damage to the habitat of a threatened species without approval.

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.

Strategies to be adopted for promoting the recovery of the Great Hammerhead Shark to a position of viability in nature must be set out in the NSW DPI Priorities Action Statement.

A recovery plan may be prepared in accordance with the provisions of the *Fisheries Management Act 1994* to promote the recovery of the species to a position of viability in nature.

## Bibliography and further reading

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Commercial fishing is one of the primary threatening processes for Great Hammerheads globally.  
Photo: Alastair Harry, Fishing & Fisheries Research Centre, James Cook University.

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## For further information

NSW DPI has produced an identification guide for sharks and rays for use by commercial fishers. This publication is available on-line at the NSW DPI website: [www.dpi.nsw.gov.au](http://www.dpi.nsw.gov.au)

Contact the NSW DPI Threatened Species Section:

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