

Blue lines indicate the area meeting the ISRA Criteria; dashed lines indicate the suggested buffer for use in the development of appropriate place-based conservation measures

FISH ROCK & GREEN ISLAND ISRA

Australia and Southeast Indian Ocean Region

SUMMARY

Fish Rock & Green Island is located on the mid-north coast of New South Wales, Australia. The area is comprised of two main dive sites: Fish Rock and Green Island. Fish Rock has a large cave through a rocky pinnacle with both sites are surrounded by rocky reefs. The area is influenced by the East Australian Current. Within this area there are: **threatened species** (e.g., Sand Tiger Shark *Carcharias taurus*); **resting areas** (Sand Tiger Shark); and **undefined aggregations** (Scalloped Hammerhead *Sphyrna lewini*).

CRITERIA

Criterion A - Vulnerability; Sub-criterion C3 - Resting Areas; Sub-criterion C5 - Undefined Aggregations

— AUSTRALIA —

— 0-42 metres —

— 5.59 km² —





DESCRIPTION OF HABITAT

Fish Rock & Green Island is located on the mid-north coast of New South Wales, Australia. The area is comprised of two main dive sites: Fish Rock and Green Island. Fish Rock is a rocky pinnacle surrounded by rocky reef which lies ~2 km southeast of Smokey Cape at South West Rocks. It has an ocean cave running 125 m through the rock, with the shallow entrance at a depth of 12 m and the deep entrance at a depth of 24 m (South West Rocks Dive Centre 2025). Green Island is located just north of Smokey Cape and is only a short distance from shore. Rocky reef surrounds the island descending to maximum depths of 18 m.

Fish Rock & Green Island is influenced by the East Australian Current, the poleward flowing western boundary current of the South Pacific Gyre (Suthers et al. 2011). Current flow is strongest in the austral summer, and the formation of eddies along this coastline also fluctuates seasonally (Ridgway & Hill 2009).

This Important Shark and Ray Area is benthic and pelagic and is delineated from inshore and surface waters (0 m) to 42 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A - VULNERABILITY

Two Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occur in the area. These are the Critically Endangered Sand Tiger Shark (Rigby et al. 2025) and Scalloped Hammerhead (Rigby et al. 2019).

SUB-CRITERION C3 - RESTING AREAS

Fish Rock & Green Island is an important resting area for one shark species.

There are multiple lines of evidence to support Sand Tiger Sharks regularly and predictably using Fish Rock & Green Island for resting. Data sources include submissions from a citizen science photo-identification database (Sharkbook 2025) and scientific surveys and acoustic tracking conducted by the New South Wales (NSW) Department of Primary Industries and Regional Development (Bradford et al. 2025; Otway & Loudon 2025).

Between 2004-2025, a total of 3,630 Sand Tiger Shark sightings were submitted from citizen scientists in the area (Spot a Shark unpubl. data 2025). From these sightings, 700 individuals were identified using photo-identification, with many individuals observed over multiple years (some >10 years). Sightings of Sand Tiger Sharks were year-round at Fish Rock, with a bimodal peak in sightings between January-March and June-July each year. Recreational divers report a range of 2-33 individuals observed per dive (S Han-de-Beaux unpubl. data 2025). Most of the sharks were visually assessed as adults based on their size with an almost equal split between males and females. Age-at-maturity for Sand Tiger Sharks is 190-200 cm total (TL) for males and 220-230 cm TL for females (Ebert et al. 2021). Courtship and mating behaviours have been anecdotally reported from this site, however, most observations are of sharks resting in the gutters between the rocky reefs of the area (S Han-de-Beaux unpubl. data 2025). At Fish Rock, up to 100 Sand Tiger Sharks have been recorded on a single dive, and at Green Island up to 20 Sand Tiger Sharks have been recorded on a single dive (D Harasti pers. obs. 2025; B Loudon pers. comms. 2025). At Fish Rock, they are primarily seen in the

shark gutter on the southern side of the rock, however, they can be seen occurring all around the area.

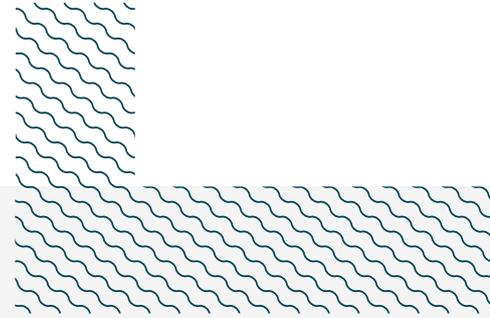
Between 2011–2021, 10-year acoustic transmitters were used to track sharks and determine their preferred habitats based on residency rates (Otway & Loudon 2025), and this information was used to determine aggregation sites. Nineteen Sand Tiger Shark aggregation sites were highlighted in eastern Australia, including this area (Bradford et al. 2025). Sand Tiger Shark aggregations were defined as a site where five or more Sand Tiger Sharks are seen aggregating either continuously or on a predictable seasonal cycle, and all were classified as resting areas for the species based on behavioural observations and habitat use at these sites. Sand Tiger Sharks were reported at Fish Rock year-round and at Green Island from autumn to summer. Between 2011–2021, all of the 31 tagged individuals were detected at Fish Rock (622,871 detections) and 22 individuals were detected at Green Island (5,056 detections; Bradford et al. 2025). Observed residence periods lasted up to 304 days at Fish Rock and seven days at Green Island (Otway & Loudon 2025). Adult males were most prevalent in autumn/winter coinciding with the annual northerly migration to Queensland waters (Bradford et al. 2025). Juvenile and non-reproductive females were prevalent over autumn/spring prior to migrating north to mate. Pregnant Sand Tiger Sharks (assessed based on distended abdomens) occupied the site in autumn/winter for further gestation over 4–5 months before migrating south in late winter to pup (Bradford et al. 2025). Sand Tiger Sharks at Fish Rock were observed swimming close to the seabed at a mean depth of 25.1 m (range: 2.7–41.8 m) and 15.5 m (range: 1.8–20.9 m) at Green Island. The sharks exhibited a diurnal usage pattern in the area, spending more time at the sites during the day (Otway & Loudon 2025).

The diel patterns in behaviour that the sharks exhibit at these sites is characteristic of Sand Tiger Sharks resting during the day and being active at night (presumably for foraging) (D Harasti pers. obs. 2025). Hovering and milling are also characteristic behaviours of resting Sand Tiger Sharks and comprise the majority of swimming behaviours observed at their main aggregation sites on Australia's east coast (Smith et al. 2015). When hovering, sharks face into the water current and their tail beats allow them to maintain a stationary position, whereas milling involves slow movements and directional changes generally confined to a particular area within a gutter (Smith et al. 2015).

SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Fish Rock & Green Island is an important area for undefined aggregations of one shark species.

Between 2005–2025, almost daily (depending on weather) recreational dives were conducted at Fish Rock within this area (South West Rocks Dive Centre unpubl. data 2025). Since 2005, seasonal Scalloped Hammerhead aggregations have been observed at this site during spring/summer (October–January) (K Hitchins pers. obs. 2025). Sightings of aggregations have been more regular since 2015, with almost daily sightings of aggregations during this season. On average, ~20–30 individuals are observed swimming together in mid-water. The numbers observed are heavily dependent on water clarity, with observations ranging between 2–100+ individuals, generally observed on the edge of diver visibility (K Hitchins pers. obs. 2025). Sightings since 2005 have been reported from ~mid-October to ~mid-January, however, since ~2022 there is an apparent earlier start to the season, with observations from September through to December (K Hitchins pers. obs. 2025). It is hypothesised that the seasonality of sightings of Scalloped Hammerheads at Fish Rock coincides with seasonal upwellings in the broader northern New South Wales region in response to the strengthening EAC (Ridgway & Hill 2009). In addition, there are anecdotal reports of Scalloped Hammerheads foraging on Yellowtail Kingfish *Seriola lalandi*, bonito (Scombridae spp.), and Mackerel Tuna *Euthynnus affinis* at Fish Rock (K Hitchins pers. obs. 2025), however, more information is needed to understand the nature and function of these aggregations.



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We acknowledge the Traditional Owners of Country throughout Australia and recognise the continuing connection to land, waters, and culture. We pay our respects to Elders past, present, and emerging.

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QUALIFYING SPECIES

Scientific Name	Common Name	IUCN Red List Category/ EPBC Act	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met									
				A	B	C1	C2	C3	C4	C5	D1	D2	
SHARKS													
<i>Carcharias taurus</i>	Sand Tiger Shark (Grey Nurse Shark)	CR/CR*	0-232	X				X					
<i>Sphyrna lewini</i>	Scalloped Hammerhead	CR/CD	0-1,043	X						X			

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
<i>Heterodontus portusjacksoni</i>	Port Jackson Shark	LC
<i>Orectolobus halei</i>	Banded Wobbegong	LC
<i>Orectolobus maculatus</i>	Spotted Wobbegong	LC
<i>Stegostoma tigrinum</i>	Indo-Pacific Leopard Shark	EN
RAYS		
<i>Aetobatus ocellatus</i>	Spotted Eagle Ray	EN
<i>Rhinoptera neglecta</i>	Australian Cownose Ray	DD
<i>Taeniurops meyeri</i>	Blotched Fantail Ray	VU

IUCN Red List of Threatened Species Categories are available by searching species names at www.iucnredlist.org Abbreviations refer to: CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern; DD, Data Deficient.

Australian Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) categories are available at: <https://www.dcceew.gov.au/environment/epbc/our-role/approved-lists> Abbreviations refer to: CR, Critically Endangered; EN, Endangered; VU, Vulnerable; CD, Conservation Dependent.

**Status for east coast population*





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