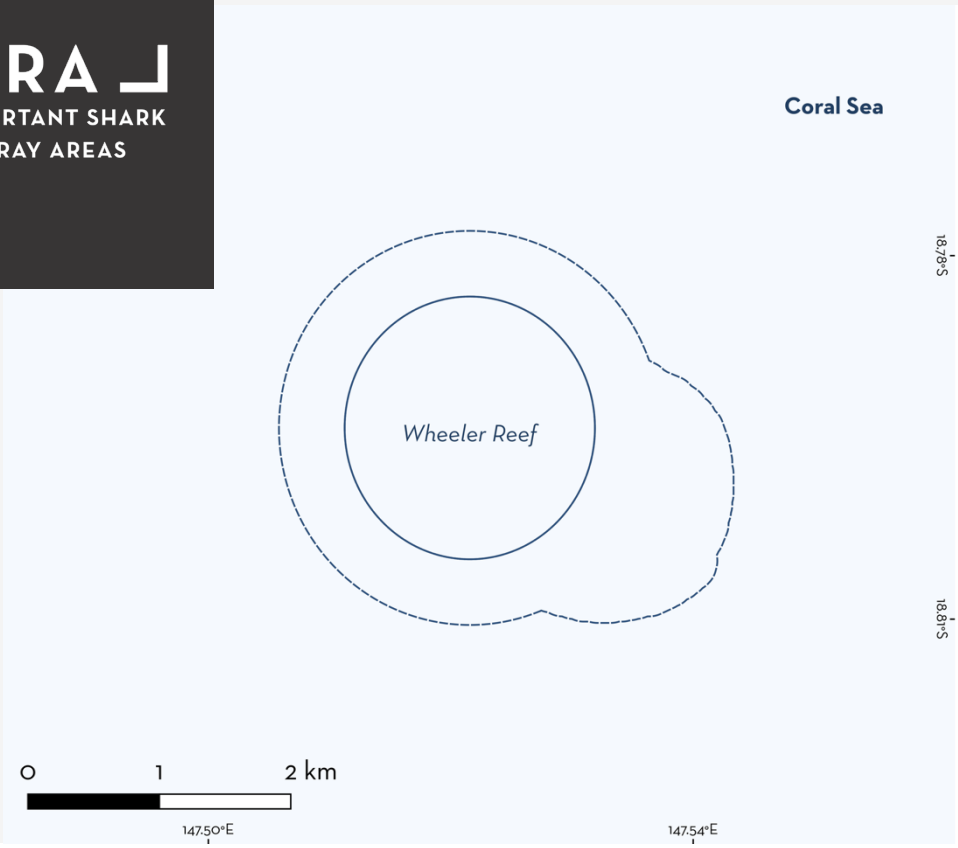
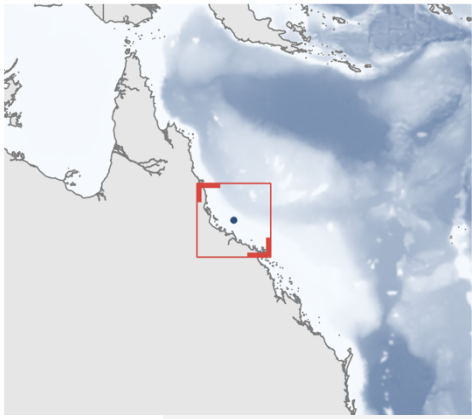
ISRA
IMPORTANT SHARK AND RAY AREAS





*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*

## WHEELER REEF ISRA

**Australia and Southeast Indian Ocean Region**

**AUSTRALIA**

**0–50 metres**

**3.0 km²**

## SUMMARY

Wheeler Reef is located on the Great Barrier Reef in Queensland, Australia. The area is situated ~90 km off Townsville. It comprises a section of a small reef that is part of a group of mid-shelf reefs separated by ~40–60 m deep channels. The habitat is characterised by a coral reef slope, reef flat, and back reef. It is mainly influenced by east to southeasterly trade winds that drive a general northward flow. The area overlaps with the Great Barrier Reef Marine Park. Within this area there are: **threatened species** and **undefined aggregations** (Grey Reef Shark *Carcharhinus amblyrhynchos*).

## CRITERIA

**Criterion A – Vulnerability; Sub-criterion C5 – Undefined Aggregations**

## DESCRIPTION OF HABITAT

Wheeler Reef is located on the Great Barrier Reef, Queensland, Australia. The area is situated ~90 km off Townsville. It comprises a section of the 2.9 km² Wheeler Reef, which is part of a group of mid-shelf reefs that includes Lodestone, Helix, and Glow Reefs, among others. These reefs are separated by wide channels with a depth of ~40–60 m. The habitat is characterised by a coral reef slope, reef flat, and back reef (Espinoza et al. 2015). Coral cover is high and dominated by *Acropora* spp.

This area is influenced by east to southeasterly trade winds and waves, by seasonal cyclones, and by coastal counter currents. The South Equatorial Current and East Australian Current are strongest along the shelf edge, but in mid-shelf waters their influence is dampened by the Great Barrier Reef, with a predominant northward flow in this area driven by the trade winds (Choukroun et al. 2010).

Wheeler Reef overlaps with the Great Barrier Reef Marine Park – Marine National Park Zone (UNEP-WCMC & IUCN 2025).

This Important Shark and Ray Area is benthic and pelagic and is delineated from 0–50 m based on the bathymetry of the area.

# ISRA CRITERIA

## CRITERION A – VULNERABILITY

One Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occurs in the area. This is the Endangered Grey Reef Shark (Simpfendorfer et al. 2020).

## SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Wheeler Reef is an important area for undefined aggregations of one shark species.

Passive acoustic telemetry data show that Grey Reef Sharks regularly aggregate in this area (Espinoza et al. 2015; M Espinoza unpubl. data 2025). A total of 40 Grey Reef Sharks (20 females, 20 males) were tagged with internal acoustic transmitters in the broader region around Wheeler (n = 7), Lodestone (n = 13), Helix (n = 10), Glow (n = 5), and other reefs (n = 5) between January 2012 and August 2013 (Espinoza et al. 2015). Their size ranged from 52–142 cm fork length (FL), and included 10 immature and 10 mature males, and six immature and 14 mature females. Of these, five females and two males were detected on the receivers in this area, with records between April 2013 to April 2014. Aggregations were defined as three or more tagged individuals detected at a receiver within five minutes. Aggregations in consecutive 5-minute bins were grouped into an event, and its duration was calculated.

There were ~240,000 detections recorded at this reef, but three receivers had few detections (0.8, 1.4, and 9.3%, respectively) and recorded only sporadic aggregations. These were excluded and the remaining two receiver locations were used to define the boundary of the area. There were 6,732 five-minute bins with aggregations recorded within the area, grouped into 4,543 aggregation events that lasted between 0.2–159 min (mean = 5.6 min). Aggregations comprised 3–6 individuals (mean = 3.2 individuals) or 43–86% of the seven tagged Grey Reef Sharks that were detected in this area. There was a seasonal signal, with more aggregations, aggregations persisting longer, and more individuals in aggregations during May–August. This was partly driven by mature females being

detected less frequently during October–February, potentially related to mating and parturition outside the receiver array. Aggregations were recorded on 342 of 359 monitoring days (95%). Combined, the data show that specific locations in the northwest of this small reef (i.e., this area) regularly host aggregations of Grey Reef Sharks that last up to ~2.5 h. Only three of 11 reefs with receivers in this study off Townsville had significant aggregations of Grey Reef Sharks. Additionally, only 14 of 40 Grey Reef Sharks tagged in this group of reefs were detected at reefs other than their home reef, generally only spending a few hours to days before returning to their home reef. At Wheeler Reef specifically, no individual was detected at other reefs. This highlights their high residency and site fidelity, and the individual importance of Wheeler Reef (Espinoza et al. 2015; M Espinoza unpubl. data 2025). More information is required to understand the nature and function of these aggregations.

**Acknowledgments**

Mario Espinoza (Universidad de Costa Rica) and Christoph A Rohner (IUCN SSC Shark Specialist Group – ISRA Project) contributed and consolidated information included in this factsheet. We thank all participants of the 2025 ISRA Region 08 – Australia and Southeast Indian Ocean workshop for their contributions to this process.

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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**Suggested citation**

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## QUALIFYING SPECIES

| Scientific Name | Common Name | IUCN Red List Category | Global Depth Range (m) | ISRA Criteria/Sub-criteria Met | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A | B | C1 | C2 | C3 | C4 | C5 | D1 | D2 |
| **SHARKS** | | | | | | | | | | | | |
| *Carcharhinus amblyrhynchos* | Grey Reef Shark | EN | 0–280 | X | | | | | | X | | |

## SUPPORTING SPECIES

| Scientific Name | Common Name | IUCN Red List Category |
|---|---|---|
| **SHARKS** | | |
| *Carcharhinus melanopterus* | Blacktip Reef Shark | VU |
| *Triaenodon obesus* | Whitetip Reef Shark | 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.*

## REFERENCES

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