

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

PENRHYN ATOLL ISRA

New Zealand & Pacific Islands Region

SUMMARY

Penrhyn Atoll is located in the northern group of the Cook Islands in the south Pacific Ocean. It is the largest atoll in the Cook Islands and includes 18 major islets. It is characterised by a coral reef that surrounds a lagoon. Omaka Reef comprises a slope, including hard coral and macroalgae and is influenced by a low current. Within this area there are: **threatened species** (e.g., Blacktip Reef Shark *Carcharhinus melanopterus*) and **undefined aggregations** (e.g., Grey Reef Shark *Carcharhinus amblyrhynchos*).

CRITERIA

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

—	—
COOK ISLANDS	
—	—
0-80 metres	
—	—
209.9 km²	
—	—





DESCRIPTION OF HABITAT

Penrhyn Atoll is located in the northern group of the Cook Islands in the south Pacific Ocean. This area, also known as Tongareva, is the largest atoll in the Cook Islands and includes 18 major islets (National Geographic 2024). The area is characterised by a coral reef that surrounds a lagoon (Britannica 2024). Omaka Reef, found in this area, comprises a slope that includes hard coral and macroalgae (J Cramp unpubl. data. 2024). The dry season is between June–December (Island on Map 2024). The area is influenced by the South Equatorial Current.

This Important Shark and Ray Area is benthopelagic and is delineated from inshore and surface waters (0 m) to 80 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 Endangered Grey Reef Shark (Simpfendorfer et al. 2020a) and the Vulnerable Blacktip Reef Shark (Simpfendorfer et al. 2020b).

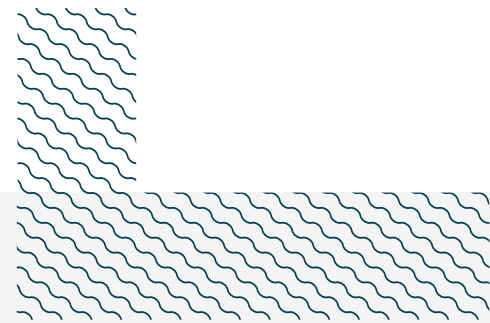
SUB-CRITERION C₅ – UNDEFINED AGGREGATIONS

Penrhyn Atoll is an important area for undefined aggregations of two shark species.

Penrhyn Atoll has some of the highest known concentrations of sharks within the Cook Islands and is known locally as ‘Shark Island’ (J Cramp pers. obs. 2024). Baited Remote Underwater Video Station (BRUVS) surveys were deployed in the area in 2018–2019 (n = 123) and 2023 (n = 108). Sharks and rays were recorded on 112 deployments in 2018–2019, and in 98 deployments in 2023 (V Udyawer pers. obs. 2024). These surveys recorded aggregations of mature Grey Reef Sharks and Blacktip Reef Sharks and were determined by the maximum number of individuals observed in a single frame of the video (MaxN; Simpfendorfer et al. 2023; J Cramp unpubl. data 2024; V Udyawer pers. obs. 2024). Aggregations of both species have been observed outside of baited surveys, for example in dive surveys submersible dives on the National Geographic Pristine Seas ARGO vessel in 2023 (V Udyawer pers. obs. 2024).

Grey Reef Sharks were recorded in 75 instances between 5.1–33.6 m depth, from BRUVS in 2018 (February, April, and August) and 2019 (February, April, September, and October) (Simpfendorfer et al. 2023). In 2023, Grey Reef Sharks were recorded on 70.4% (n = 69) of BRUVS deployments, between 7–41.8 m depth (J Cramp unpubl. data. 2024). Aggregations of 3–17 Grey Reef Sharks were recorded (mean = 5.5 individuals) in 26 instances between 8.4–31.5 m depth in low current conditions, across multiple days in April 2018 and February 2019. Most of the aggregations (n = 23) were recorded at Omoka Reef. The other three aggregations were observed at the North Lagoon site in this area. Of the 49 instances with maxN = 1 or 2 Grey Reef Sharks, 31 were at Omoka Reef and 18 were at North Lagoon (Simpfendorfer et al. 2023). The 2023 BRUVS survey was conducted in June in both the Northern Lagoon and Omoka Reef sites. Aggregations of 3–21 Grey Reef Sharks were recorded on 10 instances, all at Omoka Reef within this area (J Cramp unpubl. data 2024). Based on these BRUVS and longstanding local ecological knowledge, these aggregations are larger and more regularly observed in this area than other locations within the Cook Islands (Simpfendorfer et al. 2023; J Cramp & V Udyawer pers. obs. 2024). Further information is required to determine the nature and function of these aggregations.

Blacktip Reef Sharks were recorded in 105 instances between 3.6–36.6 m depth, from BRUVS in 2018 (April and August) and 2019 (February, April, September, and October) (Simpfendorfer et al. 2023). In 2023, Blacktip Reef Sharks were recorded on 86.7% (n = 85 instances) of deployments, between 6–41.8 m depth (J Cramp unpubl. data. 2024). Blacktip Reef Shark aggregations (three or more individuals) were recorded on over half of the sightings (n = 58 instances), between 3.6–30.3 m depth in 2018–2019 and 17% of the sightings (n = 15 instances), between 8.0–22.9 m depth in 2023. All but one of the aggregations recorded in 2018–2019 and 2023 were recorded in low current conditions. Blacktip Reef Shark aggregations were recorded across multiple days in all months that the species was recorded on the BRUVS: in 2018 (April and August), 2019 (February, April, September, and October), and 2023 (June). Aggregations of 3–13 Blacktip Reef Shark individuals were recorded (mean = 4.7 individuals). Observations of Blacktip Reef Shark aggregations were fairly evenly split between Omoka Reef (n = 32 instances) and North Lagoon (n = 26). In 2023, aggregations between 3–6 Blacktip Reef Sharks (mean = 3.6 individuals) were recorded. All but two sightings were at the North Lagoon site in this area (J Cramp unpubl. data 2024). This was consistent with the 47 instances of 1–2 Blacktip Reef Sharks as MaxN, where 27 were at Omoka Reef and 20 were at North Lagoon (Simpfendorfer et al. 2023). Based on BRUVS and longstanding ecological knowledge, these aggregations are larger and more regularly observed in this area than in other locations within the Cook Islands (Simpfendorfer et al. 2023; J Cramp & V Udyawer pers. obs. 2024). Local ecological knowledge from fishers and locals on Penrhyn Atoll have noted regular, seasonal aggregations of this species within the North Lagoon, and along the main passages in the north of the atoll (Taruaia and Siki Rangi Passages) (V Udyawer pers. obs. 2024). Further, there is photographic evidence of neonate Blacktip Reef Sharks within the lagoon. However, further information is required to determine the regularity and predictability of the observations as well as the nature and function of these aggregations.



Acknowledgments

Jessica Cramp (Sharks Pacific), Vinay Udyawer (Sharks Pacific), and Ryan Charles (IUCN SSC Shark Specialist Group – ISRA Project) contributed and consolidated information included in this factsheet. We thank all participants of the 2024 ISRA Region 10 – New Zealand and Pacific Islands workshop for their contributions to this process.

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Suggested citation

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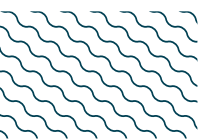
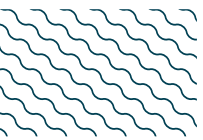
QUALIFYING SPECIES

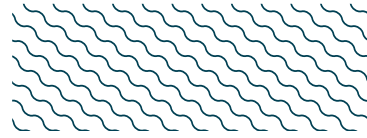
Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				A	B	C1	C2	C3	C4	C5	D1	D2
SHARKS												
<i>Carcharhinus amblyrhynchos</i>	Grey Reef Shark	EN	0-280	X						X		
<i>Carcharhinus melanopterus</i>	Blacktip Reef Shark	VU	0-100	X						X		

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
<i>Carcharhinus albimarginatus</i>	Silvertip Shark	VU
<i>Carcharhinus falciformis</i>	Silky Shark	VU
<i>Carcharhinus longimanus</i>	Oceanic Whitetip Shark	CR
<i>Nebrius ferrugineus</i>	Tawny Nurse Shark	VU
<i>Triaenodon obesus</i>	Whitetip Reef Shark	VU
RAYS		
<i>Aetobatus ocellatus</i>	Spotted Eagle Ray	EN
<i>Mobula alfredi</i>	Reef Manta Ray	VU

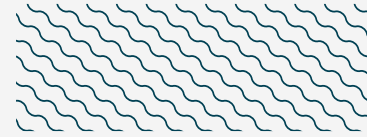
IUCN Red List of Threatened Species Categories are available by searching species names at www.iucnredlist.org Abbreviations refer to: CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern; DD, Data Deficient.





SUPPORTING INFORMATION

There are additional indications that Penrhyn Atoll may be an important area for undefined aggregations of two shark species and one ray species. Aggregations of Tawny Nurse Sharks have been recorded from BRUVS in Omoka and Te Tautua Passages. Further information is required to determine the regularity and predictability of the observations, and the presence of aggregations independent of bait. Groups of up to 12 Silvertip Sharks have been recorded from BRUVS, with solitary animals only being recorded on 15% of total sightings from BRUVS in the area. Also, Taruia Passage is used by Reef Manta Ray as a cleaning station (J Cramp & V Udyawer pers. obs. 2024). However, further information is required to determine the regularity and predictability of the observations, and the importance of this area for these species.



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