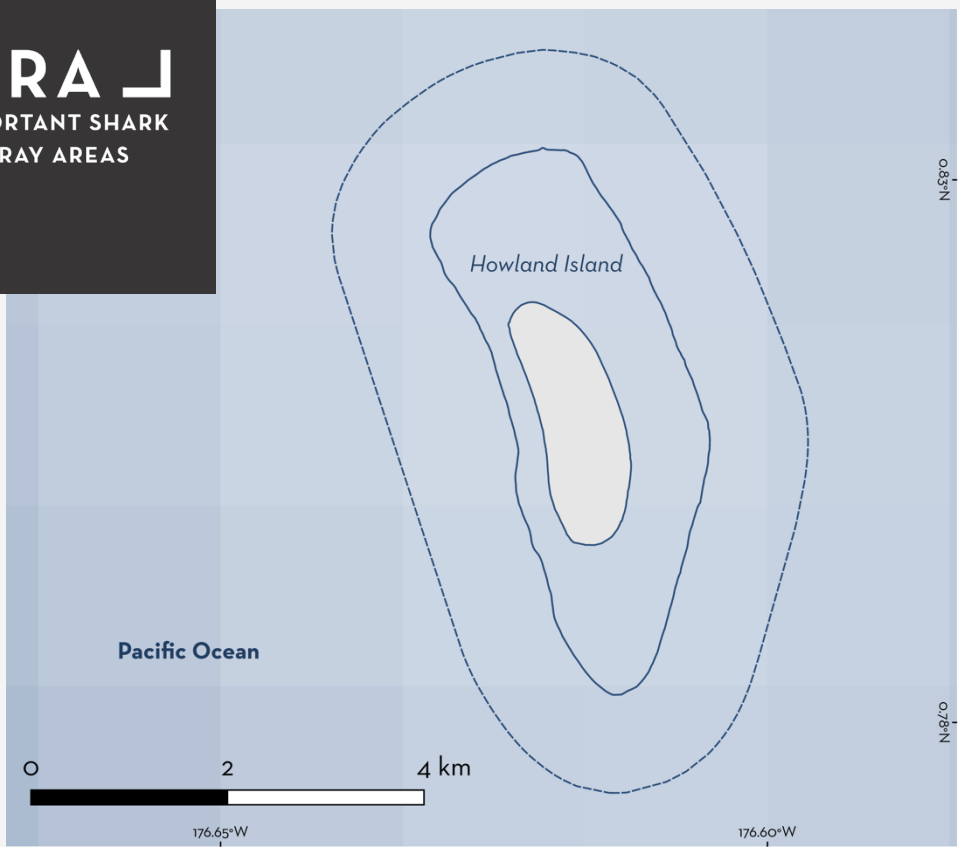
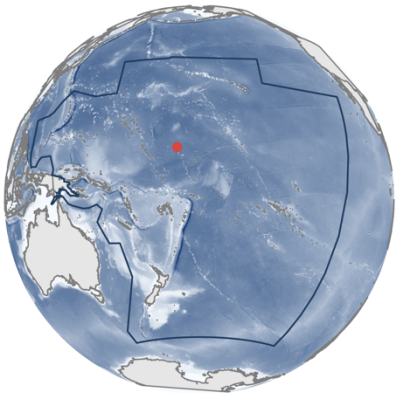
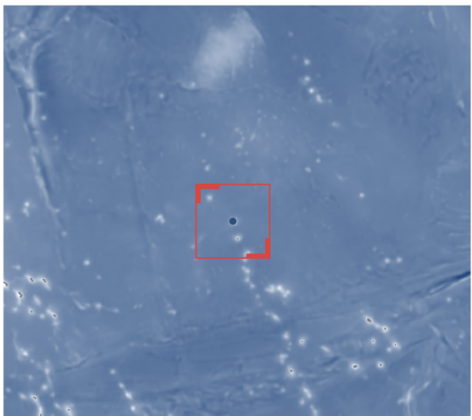
ISRA
IMPORTANT SHARK AND RAY AREAS







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

HOWLAND ISLAND ISRA

New Zealand & Pacific Islands Region

SUMMARY

Howland Island is located in the central equatorial Pacific Ocean and forms part of the Phoenix Islands group. This uninhabited coral reef platform is a territory of the United States of America. The area encompasses the narrow fringing reef with a steep slope surrounding the island, with a benthic habitat dominated by hard coral and crustose coralline algae. The area overlaps with two marine protected areas, one Ecologically or Biologically Significant Marine Area, and two Key Biodiversity Areas. Within this area there are: **threatened species, reproductive areas**, and **undefined aggregations** (Grey Reef Shark *Carcharhinus amblyrhynchos*).

CRITERIA

Criterion A – Vulnerability; Sub-criterion C1 – Reproductive Areas; Sub-criterion C5 – Undefined Aggregations

HOWLAND ISLAND

0–280 metres

7.11 km²

DESCRIPTION OF HABITAT

Howland Island is located in the central equatorial Pacific Ocean and is part of the Phoenix Islands group. This low-lying, uninhabited coral reef platform is a territory of the United States of America (Brainard et al. 2019). The island is influenced by the westward-flowing South Equatorial Current at the surface and the opposing eastward-flowing subsurface Equatorial Undercurrent. This dynamic interaction, along with wind-driven equatorial upwelling and topographic upwelling from the Equatorial Undercurrent, contributes to the area's high productivity (Brainard et al. 2019). The island's marine environment features a narrow fringing reef with steep slopes and a broad, shallow reef terrace on the east side. The benthic habitat is dominated by hard coral and crustose coralline algae (Brainard et al. 2019).

The area overlaps with the Howland Island National Wildlife Refuge and the Pacific Remote Islands Marine National Monument (UNEP-WCMC & IUCN 2024), the Equatorial High-Productivity Zone Ecologically and Biologically Marine Significant Area (EBSA; CBD 2024), and the Howland and Baker Marine Key Biodiversity Area (KBA) and the Howland Island KBA (KBA 2024 a, b).

This Important Shark and Ray Area is delineated from surface waters (0 m) to 280 m based on the depth range of the Qualifying Species.

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 C1 – REPRODUCTIVE AREAS

Howland Island is an important reproductive area for one shark species.

Aggregations of neonates and young-of-the-year (YOY) Grey Reef Sharks are observed in the area. Long-term National Oceanic and Atmospheric Administration (NOAA) Coral Reef Ecosystem Program (CREP) surveys support that this species gathers around the island regularly and predictably. There is contemporary and historical evidence of these observations recorded through towed-diver surveys (TDS) and stationary point count (SPC) surveys between 2001 and 2023 (Brainard et al. 2019).

The TDS method involves two divers being towed behind a boat along a ~2.2 km track. At a depth of ~15 m, the divers recorded the number, size (total length, TL), and species of fish larger than 50 cm TL within a belt-transect extending 5 m on either side and 10 m in front of them, from the bottom to the surface (total area surveyed = 20,000 km^2) (Brainard et al. 2019). In SPC surveys, two divers conduct simultaneous count of all fishes in adjacent visually estimated 15-m-diameter cylindrical plots extending from the substrate to the limits of vertical visibility. The SPC survey is a comprehensive small-scale survey approach that covers small areas of the reef (~3.5–6 km^2), thus, aggregations, and rare and patchily distributed species are not well surveyed. During these surveys estimated size (TL) was recorded as (Brainard et al. 2019).

In total, 717 Grey Reef Sharks were recorded aggregating in Howland Island in groups of three or more individuals, over 186 surveys (SPC and TDS), and 30 out-of-survey records. Of these, 168

(23.4%) were determined to be neonate or YOY. Overall, 99 neonates (13.8%), measuring ≤65 cm total length (TL), and 69 YOY (9.6%), measuring ≤80 cm TL were recorded. Size-at-birth for this species is 45–64 cm TL (Ebert et al. 2021), with an estimated growth of up to 14.69 cm/year in the Pacific Ocean (Bradley et al. 2017). On 24 occasions, aggregations of up to 28 neonates and YOY (<80 cm TL) were recorded over multiple years during NOAA expeditions (CREP PIFSC 2017a, b, c, d, e, f; PIFSC 2024). Thirteen of these aggregations comprised only neonates and YOY sharks, with nine aggregations of 3–20 individuals (average 9.1 individuals; SD = 8.1) in 2010, and nine aggregations of 3–20 individuals in 2010, and four aggregations of 3–28 individuals (average 10.3 individuals; SD = 11.9) in 2023, highlighting the importance of the area for the reproduction of this species.

SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Howland Island is an important area for undefined aggregations of one shark species.

Between 2001–2023, 55 TDS (2001 = 2; 2002 = 3; 2004 = 8; 2006 = 6; 2008 = 7; 2010 = 10 ; 2012 = 9; 2015 = 5; 2017 = 5), and 131 SPC surveys (2008 = 10; 2010 = 16; 2012 = 39; 2015 = 35; 2023 = 31) were conducted in the area (CREP PIFSC 2017a, b, c, d, e, f; PIFSC 2024). Grey Reef Sharks were the most observed shark species, with sightings in 96% of the TDS, and 39.2% of the SPC. In total, 83 aggregations of three animals or more were recorded during the surveys (TDS and SPC) (63 aggregations), and 'off survey' (20 aggregations). These undefined aggregations are additional to the neonate and YOY aggregations for reproduction.

The largest aggregations were recorded from 2006 with 35 individuals (100 cm TL) and 2004 with 33 individuals (88–125 cm TL). There were records of aggregations every year the area was surveyed, with three aggregations of 3–5 individuals (63–90 cm TL) in 2001; 13 aggregations of 3–8 individuals (63–225 cm TL) in 2002; 24 aggregations of 3–33 individuals (63–175 cm TL) in 2004; 14 aggregations of 3–35 individuals (88–175 cm TL) in 2006; 10 aggregations of 3–22 individuals (100–140 cm TL) in 2008; 12 aggregations of 3–22 individuals (50–120 cm TL) in 2010; five aggregations of 3–5 individuals (105–170 cm TL) in 2012; three aggregations of 3–4 individuals (105–160 cm TL) in 2015; five aggregations of 3–8 individuals (105–135 cm TL) in 2017; and 11 aggregations (60–200 cm TL) in 2023 (CREP PIFSC 2017a, b, c, d, e, f; PIFSC 2024).

These observations include animals all measuring between 50–225 cm TL, with most of the aggregations corresponding to juveniles (size at maturity for this species 130–145 cm TL for males, and 120–142 cm TL for females [Ebert et al. 2021]). Further information is required to determine the function and nature of these aggregations.

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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				X		

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Carcharhinus galapagensis	Galapagos Shark	LC
Carcharhinus melanopterus	Blacktip Reef Shark	VU
Sphyrna lewini	Scalloped Hammerhead	CR
Triaenodon obesus	Whitetip Reef Shark	VU
RAYS		
Aetobatus ocellatus	Spotted Eagle Ray	EN
Mobula alfredi	Reef Manta Ray	VU
Taeniura meyeni	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.

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