

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

## VOSTOK ISRA

### New Zealand & Pacific Islands Region

#### SUMMARY

Vostok is located in the southern Line Islands in Kiribati in the central Pacific Ocean. This uninhabited and remote island is part of a seamount chain that extends 4,800 km. The region has some of the highest coral coverages reported globally. Within this area there are: **threatened species** and **undefined aggregations** (Grey Reef Shark *Carcharhinus amblyrhynchos*).

#### CRITERIA

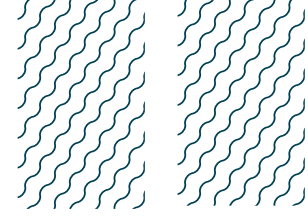
**Criterion A - Vulnerability; Sub-criterion C5 - Undefined Aggregations**

KIRIBATI

0-70 metres

1.57 km<sup>2</sup>





## DESCRIPTION OF HABITAT

Vostok is located in the Southern Line Islands in Kiribati in the central Pacific Ocean. The southern Line Islands are composed of five islands (Flint, Vostok, Millennium, Starbuck, and Malden) that are part of a seamount chain consisting of a series of ridges and seamounts that extend 4,800 km across the central Pacific basin (Keating 1992). The seamounts rise abruptly from a sea floor >5,000 m deep. The islands are influenced by the South Equatorial Current and by easterly trade winds (Maragos et al. 2008). The Southern Line Islands reside near the transition zone between the western warm pool and the equatorial cold-tongue (Friedlander et al. 2022). Sea surface temperatures, ocean currents, precipitation, and primary productivity in the region are highly variable between years due to the El Niño Southern Oscillation (Friedlander et al. 2022).

The nearest neighbouring islands to Vostok are Flint Island, 158 km south-southeast, and Millennium, 230 km to the east. The island is 1.3 km in length with a triangular shape. The average coral cover is high in this area (52.7%) and is reported to be among the highest levels of coral cover globally (Friedlander et al. 2022). The stony corals *Montipora* and *Pocillopora* spp. account for most of this coral cover with reefs being healthy and diverse for this region (National Geographic 2009; Friedlander et al. 2022).

This Important Shark and Ray Area is benthopelagic and is delineated from inshore and surface waters (0 m) to 70 m based on the depth range of Qualifying Species in 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

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

Aggregations of Grey Reef Sharks are regularly observed in this area, as documented by underwater visual censuses and baited remote underwater video station (BRUVS) surveys (National Geographic 2009; Friedlander et al. 2022).

Two expeditions were undertaken in the Southern Line Islands (National Geographic 2009; Friedlander et al. 2022). Between 27 March–5 May 2009, underwater visual censuses were conducted by a team of paired divers at ~15 m depth at 29 sites in this area (National Geographic 2009). Between 9–20 October 2021, similar surveys were undertaken at 17 sites in this area (Friedlander et al. 2022). Each site was surveyed using three transects separated by ~10 m. During each survey, divers counted and measured (average total length [TL] was visually estimated) all sharks observed along three fixed-length (25 m) corridor transects. Additionally, during the expedition in October 2021, BRUVS were deployed and the maximum number of individuals in a single video frame (MaxN) was recorded for each taxon (Friedlander et al. 2022). Mid-water BRUVS were deployed at 10 survey sites in the area at a depth of 10 m and ranged from 500 m to 5 km from shore (Friedlander et al. 2022). Further, BRUVS were deployed in mesophotic reefs at nine survey

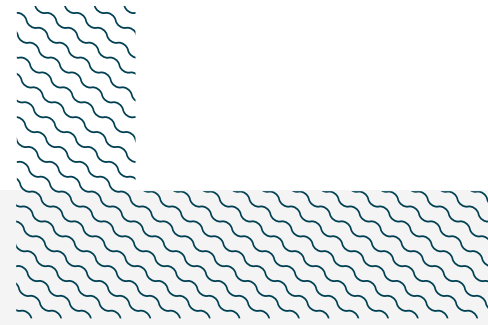
sites in this area at depths between 50–65 m and in habitats from plate coral reefs to rubble/sand slopes (Friedlander et al. 2022).

In 2009, total fish biomass estimated in the underwater visual censuses ranged between 2.1–5.8 tonnes per 0.01 km<sup>2</sup> for the five islands assessed in the southern Line Islands (Flint, Vostok, Starbuck, Malden, and Millennium). Vostok had a biomass of ~4 t per 0.01 km<sup>2</sup>. This area is among the top seven highest fish biomass ever reported globally (National Geographic 2009). Top predators, including sharks and other fishes (e.g., Twinspot Snapper *Lutjanus bohar*, trevally *Caranx* spp.), accounted for most of the biomass (~70%). The most abundant top predators were Grey Reef Sharks (National Geographic 2009). Fish biomass was highest on the windward side of islands or near the island tips, where dominant currents form eddies and enhance water motion.

The underwater visual censuses showed that the Grey Reef Shark was the first-ranked top predator species with an average of 16.7 (SD = ±44.7) individuals per 0.01 km<sup>2</sup> (Pristine Seas unpubl. data 2022). Maximum values were recorded from four surveys with 100 sharks per 0.01 km<sup>2</sup>, and in one survey with 200 individuals per 0.01 km<sup>2</sup> (Pristine Seas unpubl. data 2022).

In five surveys, Grey Reef Sharks had body sizes that ranged between 53–153 cm TL, with an average of 98 cm TL (Pristine Seas unpubl. data 2022). Considering the size-at-maturity (120–142 cm TL for females, 130–145 cm TL for males), and the size-at-birth (45–64 cm TL) for this species (Ebert et al. 2021), individuals were mostly neonates, young-of-the-year, and juveniles. This area could be an important reproductive area for this species, however, further information is needed to confirm the function and nature of these aggregations.

Data from BRUVS surveys conducted in mesophotic reefs indicated that Grey Reef Sharks had a maximum MaxN of 13 and an average of 3.3 individuals per frame (Pristine Seas unpubl. data 2022).



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Alan M Friedlander (National Geographic Society; University of Hawaii), Tooreka Taatoa (Ministry of Fisheries & Marine Resources Development), and Adriana Gonzalez Pestana (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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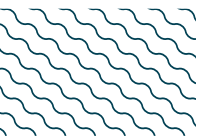
## QUALIFYING SPECIES

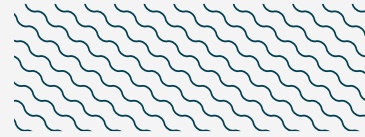
| Scientific Name                   | Common Name     | IUCN Red List Category | Global Depth Range (m) | ISRA Criteria/Sub-criteria Met |   |    |    |    |    |    |    |    |  |
|-----------------------------------|-----------------|------------------------|------------------------|--------------------------------|---|----|----|----|----|----|----|----|--|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

## SUPPORTING SPECIES

| Scientific Name                  | Common Name         | IUCN Red List Category |
|----------------------------------|---------------------|------------------------|
| SHARKS                           |                     |                        |
| <i>Carcharhinus melanopterus</i> | Blacktip Reef Shark | VU                     |

*IUCN Red List of Threatened Species Categories are available by searching species names at [www.iucnredlist.org](http://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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