

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

SAMARAI ISLANDS ISRA

New Zealand & Pacific Islands Region

SUMMARY

Samarai Islands is located on the southeastern tip of mainland Milne Bay in Papua New Guinea. This area encompasses part of the China Strait, Sariba Island, Sideia Island, Gonu Bara Bara and smaller surrounding islands. Samarai Islands is characterised by fringing coral reefs, intertidal reef flats, seagrass beds, and mangrove forests. The area is influenced by seasonal winds with changing directions influencing the sea surface temperature and the mixed layer depth. Within this area there are: **threatened species** (e.g., Michael's Epaulette Shark *Hemiscyllium michaeli*); **range-restricted species** (Michael's Epaulette Shark); **feeding areas** (Reef Manta Ray *Mobula alfredi*); and **undefined aggregations** (Reef Manta Ray).

CRITERIA

Criterion A - Vulnerability; Criterion B - Range Restricted;
Sub-criterion C2 - Feeding Areas; Sub-criterion C5 - Undefined Aggregations

PAPUA NEW
 GUINEA

0-50 metres

150 km²





DESCRIPTION OF HABITAT

Samarai Islands is located on the southeastern tip of mainland Milne Bay in Papua New Guinea. The area encompasses the surrounding waters of several uninhabited islands, Ito Island, Gonu Bara Bara Island, Samari Island, Deka Deka Island and a portion of the west coast of Sideia Island and the east coast of Sariba Island including part of the China Strait between Milne Bay and the Samarai Islands. The area is characterised by shallow fringing coral reefs surrounding the islands and intertidal reef flats with extensive seagrass beds (Allen et al. 2003; MV Erdmann pers. obs. 2024). The larger islands of Sideia and Sariba have extensive mangrove forests. In much of the area, coral reefs, seagrass beds, and mangroves transition seamlessly into one another, with corals and seagrasses found growing amongst the roots of the mangroves (MV Erdmann pers. obs. 2024).

The China Strait is a productive area formed by a passage ~2 km wide by 7 km long that runs between the mainland of Milne Bay and the Samarai Islands. The area includes two cleaning stations: 'Manta Heaven', a shallow cleaning station located at Sideia Island and a network of five large coral bommies at Gonu Bara Bara Island. 'Manta Heaven' is formed by a sloping fringing reef ~0-4 m depth, with a steep reef slope to 50 m, formed of a single large (~8 m²) patch of *Acropora* branching corals in 1.5-3 m depth water. Gonu Bara Bara Island hosts another cleaning station, formed by a network of coral bommies with a large porites coral bommie sitting at 8 m depth and at least four additional bommies scattered nearby (MV Erdmann pers. obs. 2024).

The area is strongly influenced by seasonal shifting wind conditions. From May–October, winds blow strongly from the southeast to the northwest, sea surface temperature drops, and the mixed layer depth deepens (Allen et al. 2003). From November–April, winds are reduced and blow from the northeast towards the southwest, accompanied by an increase in sea surface temperature, shallowing of the mixed layer depth, and reduced upwelling (Allen et al. 2003).

This Important Shark and Ray Area is benthic and pelagic and is delineated from inshore and surface waters (0 m) to 50 m based on the bathymetry of the area and the habitat used by the Qualifying Species.

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 Vulnerable Michael's Epaulette Shark (VanderWright et al. 2021) and Reef Manta Ray (Marshall et al. 2022).

CRITERION B – RANGE RESTRICTED

Samarai Islands holds the regular and predictable presence of Michael's Epaulette Shark as a resident range-restricted species. This species has been reported from the area since 2006 based on scientific divers' observations (MV Erdmann pers. obs. 2024). Michael's Epaulette Shark is primarily observed on shallow water habitats including coral reefs, seagrass beds, and subtidal mangrove roots within the area (Allen et al. 2016). Samarai Islands is considered one of the 'hotspots' for Michael's Epaulette Shark within its very restricted range (Allen et al. 2016; Vanderwright et al. 2022).

Between 2006–2022, nine dive trips were conducted focusing on manta ray and reef fish biodiversity surveys. Between three to nine Michael’s Epaulette Shark individuals were observed during each of the dive trips within the area (MV Erdmann pers. obs. 2024). Additionally, in November 2023, a total of 14 Michael’s Epaulette Sharks were caught and sampled across several habitat types (seagrass, mangrove, and sandy substrates) during two nights at Sideia Island and Doini Island within the area (J Blakeway & MV Erdmann unpubl. data 2024). Using photo-identification, five males and nine females ranging in size between 41.3–74.8 cm total length (TL) were recorded (J Blakeway unpubl. data 2024). Size-at-birth for the species is less than 20 cm TL (Ebert et al. 2021), indicating these were adult individuals. Further, in interviews conducted at Sideia Island, community members stated that they often catch Michael’s Epaulette Sharks while fishing, highlighting the regular presence of the species in the area (J Blakeway unpubl. data 2024).

Although the home range of Michael’s Epaulette Shark has not been formally investigated, it is believed that all nine species of *Hemiscyllium* have extremely small home range sizes. As benthic dwelling, egg laying sharks, individuals have low dispersal abilities at all life stages and are considered to be highly site specific (Allen et al. 2016; MV Erdmann unpubl. data 2020; VanderWright et al. 2022). Michael’s Epaulette Shark does not occur in any Large Marine Ecosystem and is endemic to the Milne Bay and Oro provinces of Papua New Guinea (VanderWright et al. 2022).

SUB-CRITERION C2 – FEEDING AREAS

Samarai Islands is an important feeding area for one ray species.

Between 2006–2022, snorkelling and drone surveys using photo-identification and citizen science observations were conducted in the area, resulting in 52 sightings of Reef Manta Rays (MV Erdmann pers. obs. 2022). Reef Manta Ray regularly aggregate in the area, with feeding behaviour observed in 60% (n = 31) of all observations, with a maximum of 14 individuals feeding at the same time (MV Erdmann pers. obs. 2022).

Additionally, feeding behaviour has been anecdotally observed since the early 2000s in the area by recreational divers including the crew of liveaboard vessels (MV Chertan & The Golden Dawn pers. comm. 2024). Specific sites within the area where Reef Manta Ray feeding activity has been observed include the waters between Gonu Bara Bara and Doini islands, around Ito Island, and in the Strait between Sideia and Sariba Islands.

The observed feeding aggregations in this area may be linked to the high concentrations of zooplankton. The area is in close proximity to the China Strait which connects the Coral Sea in the south to Milne Bay and the Solomon Sea to the north and influences the flow of currents and therefore plankton availability (Allen et al. 2003).

SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

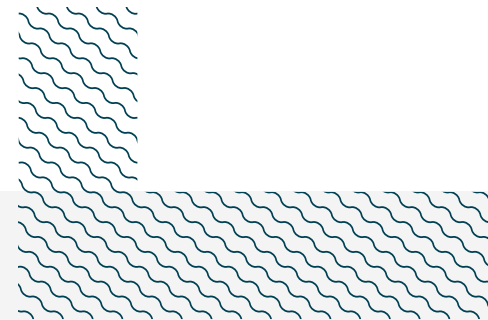
Samarai Islands is an important area for undefined aggregations of one ray species.

The area is a year-round aggregation site for Reef Manta Rays and includes two cleaning stations (MV Erdmann pers. obs. 2022). Between 2016–2018, 38 snorkelling and diving surveys (32 days of survey effort) were conducted focusing on the cleaning stations in the area, and photo-identification recorded a total of 75 sightings of 61 individuals (MV Erdmann pers. obs. 2018). Numerous additional sightings were observed by drone (but not photo-identified). Cleaning behaviour was observed in 100% (n = 38) of these surveys (MV Erdmann pers. obs. 2018). Aggregations of up to eight Reef Manta Rays have been observed by drone utilising ‘Manta Heaven’

at a given time and 12 individuals were recorded by photo identification in a single day (MV Erdmann pers. obs. 2024). At least two aggregations of ten or more Reef Manta Rays were observed in the area in December 2016 (n = 1) and May 2018 (n = 1). One courtship train was observed involving four individuals at the cleaning station (MV Erdmann pers. obs. 2024). From a total of 61 individuals, 13 were resighted in the area between 2016–2018 with a minimum of one day between sightings to a maximum period of ~2 years (MV Erdmann pers. obs. 2024). The disc widths of sighted individuals were estimated between 240–400 cm, with 55 determined to be adults. Slightly more females were identified than males, with 33 females, 24 males, and four unsexed individuals.

Additionally, nine Reef Manta Rays were tagged with SPLASH-10-Fastloc GPS satellite tags in May 2016, December 2016, and May 2018 (tracking duration 4–180 days; MV Erdmann pers. obs. 2024). Tagged Reef Manta Rays showed residency to the area, with three individuals resighted at their tagging locations after 18–24 months post-tagging (MV Erdmann pers. obs. 2024). Connectivity between the Samarai Islands where ‘Manta Heaven’ is located and Gonu Bara Bara Island within the area was evidenced by movements of Reef Manta Rays (n = 3) with photo-identification and satellite tags in 2016–2018 (MV Erdmann pers. obs. 2024).

No seasonality has been identified for this location using a combination of outputs including tags, diver observations, and local knowledge.



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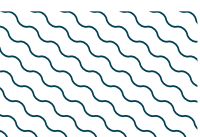
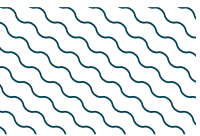
QUALIFYING SPECIES

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>Hemiscyllium michaeli</i>	Michael's Epaulette Shark	VU	0-20	X	X								
RAYs													
<i>Mobula alfredi</i>	Reef Manta Ray	VU	0-711	X			X			X			

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
<i>Carcharinus amblyrhynchos</i>	Grey Reef Shark	EN
<i>Carcharinus melanopterus</i>	Blacktip Reef Shark	VU
<i>Eucrossorhinus dasypogon</i>	Tasselled Wobbegong	LC
<i>Stegostoma tigrinum</i>	Indo-Pacific Leopard Shark	EN
<i>Triaenodon obesus</i>	Whitetip Reef Shark	VU
RAYS		
<i>Aetobatus ocellatus</i>	Spotted Eagle Ray	EN
<i>Taeniura lymma</i>	Bluespotted Lagoon Ray	LC
<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.





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