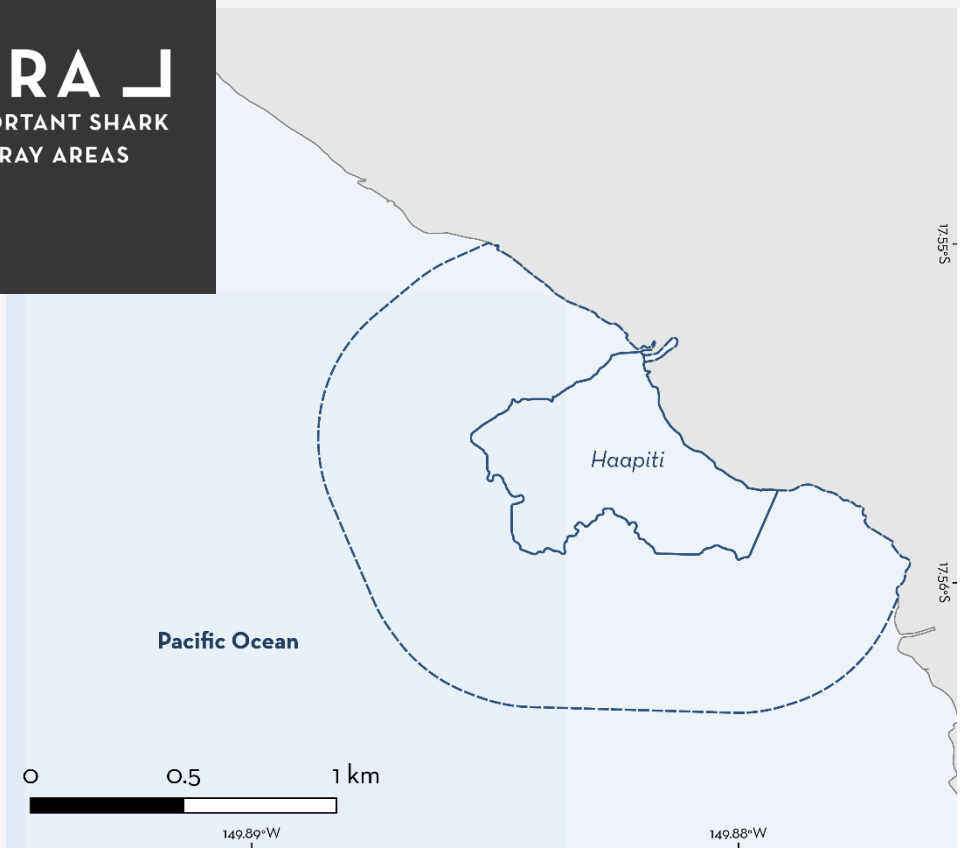
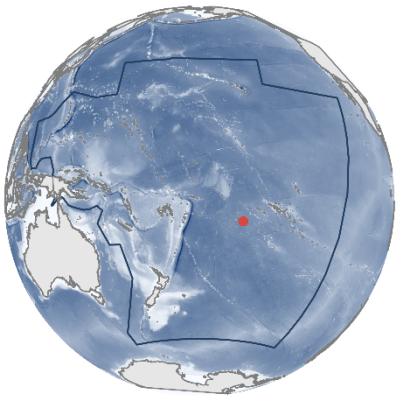
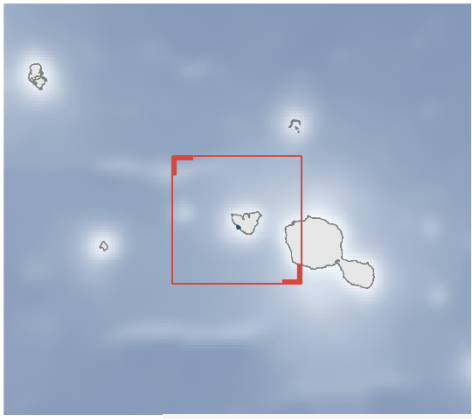
ISRA
IMPORTANT SHARK AND RAY AREAS







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

HAAPITI ISRA

New Zealand & Pacific Islands Region

FRENCH POLYNESIA

0–10 metres

0.37 km²

SUMMARY

Haapiti is located on the western side of Moorea Island in the Society Archipelago of French Polynesia. The area encompasses a fringing reef bordering a small lagoon. Haapiti is characterised by a homogenous mix of corals, muddy and sandy substrates, and is influenced by low tidal variation. This area overlaps with the Lagon de Moorea Ramsar site and the Tetiaroa, Moorea et Tahiti Marine Key Biodiversity Area. Within this area there are: **threatened species** and **reproductive areas** (Blacktip Reef Shark *Carcharhinus melanopterus*).

Criterion A – Vulnerability; Sub-criterion C1 – Reproductive Areas

DESCRIPTION OF HABITAT

Haapiti is located on the western side of Moorea Island in the Society Archipelago of French Polynesia. The area is within Moorea's narrow lagoon system and encompasses a fringing reef bordering a small lagoon. Haapiti is characterised by a homogenous mix of corals, muddy and sandy substrates at depths <2 m within 50 m of shore, but deeper lagoons are also present (Bouyoucos et al. 2023; Eustache et al. 2024). The area is influenced by low tidal variation (~20–30 cm) (Bouyoucos et al. 2023) and currents generally oriented from the crest towards the channel, largely induced by waves (Ramsar Convention 2008; Berthe et al. 2018).

This area overlaps with the Lagon de Moorea site (Ramsar Convention 2008) and the Tetiaroa, Moorea and Tahiti Marine Key Biodiversity Area (KBA 2024).

This Important Shark and Ray Area is benthopelagic and is delineated from inshore and surface waters (0 m) to 10 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 Vulnerable Blacktip Reef Shark (Simpfendorfer et al. 2020).

SUB-CRITERION C1 – REPRODUCTIVE AREAS

Haapiti is an important reproductive area for one shark species.

During surveys conducted in 2007–2011, a total of 97 (96%) neonates and young-of-the-year (YOY) were captured in this area. Animals ranged from 49 to 60 cm TL (Mourier et al. 2013). Size-at-birth for this species is 30–52 cm total length (TL; Ebert et al. 2021). Further, between 2007–2010, microsatellite DNA markers and a likelihood-based parentage analysis were conducted to determine breeding patterns of female Blacktip Reef Sharks in the island of Moorea (Mourier & Planes 2013). Pregnant females were philopatric, migrating to the same nursery for every birthing event. The area was used as a breeding site by nine pregnant females (187 adults sampled) and was used by the same females (n = 2) across several years (2007-2009) (Mourier & Planes 2013).

Between 2013–2022, a fisheries-independent program led by the Center for Island Research and Environmental Observatory (CRIOBE) was conducted at ten sites around Moorea Island, including in Haapiti (Bouyoucos et al. 2023; Eustache et al. 2024). The area was sampled twice per month, between October–February, using a monofilament gillnet (50 m x 1.5 m, with a 5 cm mesh size) set perpendicular to the shore for approximately three hours in the evening. Captured animals were fin-clipped, sexed, measured, weighed, and had their umbilical scars photographed with a size reference. The sharks sampled were identified as neonate or YOY based on the healing stage of the umbilical scar and their TL (Bouyoucos et al. 2023; Eustache et al. 2024). Fishing survey data were used to quantify catch-per-unit-effort (CPUE, sharks h^{-1}) per gillnet set per site and per survey year (Bouyoucos et al. 2023; Eustache et al. 2024). These CPUE data were then used to test the three shark nursery area criteria (Heupel et al. 2007) to identify which of the 10 sites function as shark nursery areas (Bouyoucos et al. 2023).

Between 2013–2022, a total of ~289 neonates and YOY Blacktip Reef Shark were captured in the area (Physioshark Lab unpubl. data 2024). The seasonal pattern for parturition occurs annually from October–February when neonates and YOY are captured (Mourier & Planes 2013). The area has been described as a nursery area for Blacktip Reef Sharks (Mourier & Planes 2013) and presented the highest CPUE (0.0398 mean ± 0.0425 SD), and number of captured neonates and YOY among the 10 sites surveyed in Moorea from 2013–2022 (Eustache et al. 2024; Physioshark Lab unpubl. data 2024).

Haapiti is one of the several areas of importance for neonates and YOY Blacktip Reef Sharks that have been identified around Moorea Island (Mourier & Planes 2013; Bouyoucos et al. 2023; Eustache et al. 2024). The existence of several of these areas dispersed around the island is attributed to the small home ranges of neonatal Blacktip Reef Sharks in Moorea. Research using mark-recapture and acoustic telemetry has shown that these home ranges are the smallest documented for the species, likely due to the deep channels within Moorea's lagoon and the fragmented habitat (Bouyoucos et al. 2020). Additionally, pregnant female Blacktip Reef Sharks exhibit philopatry, returning to the same nursery for each birthing event (Mourier & Planes 2013). These factors together explain the presence of multiple nursery areas or areas that are crucial for neonate and young-of-the-year Blacktip Reef Sharks around Moorea Island.

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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 melanopterus	Blacktip Reef Shark	VU	0-100	X		X						

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Negaprion acutidens	Sharptooth Lemon Shark	EN
RAYS		
Pateobatis fai	Pink Whipray	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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