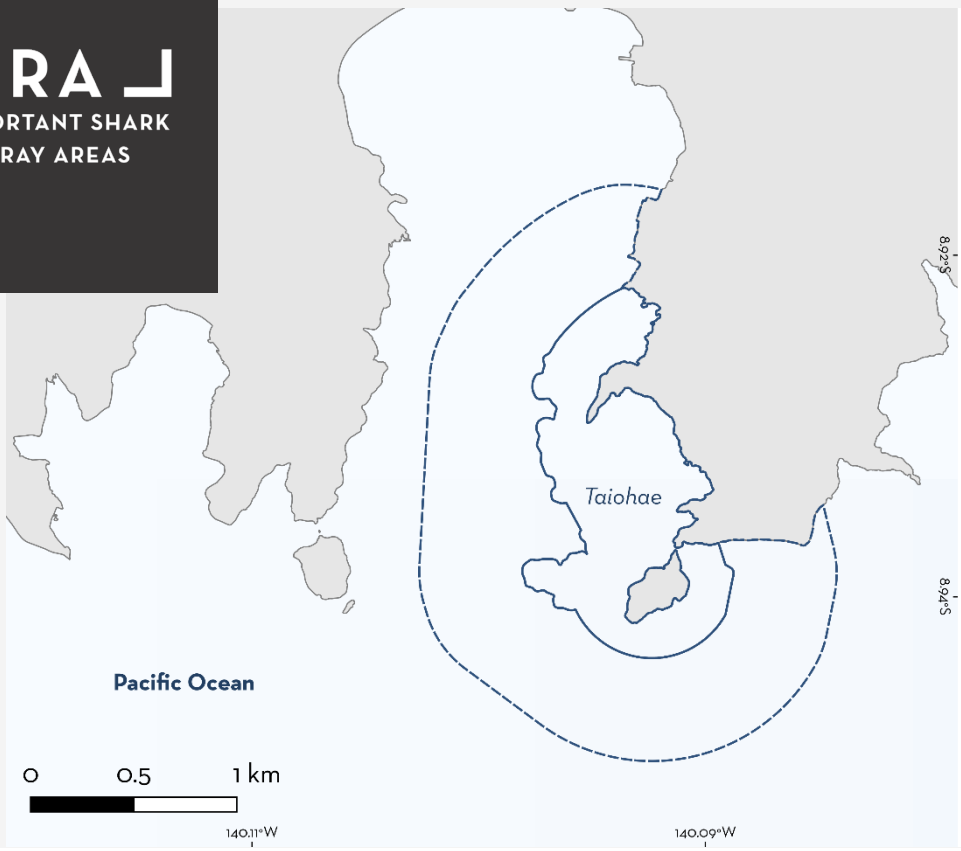
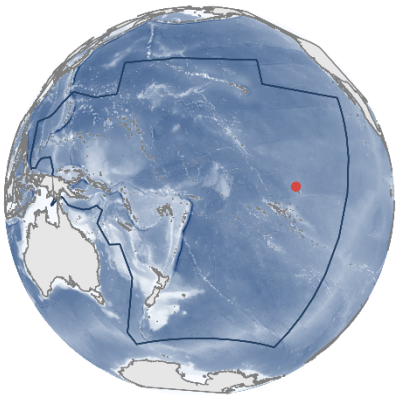
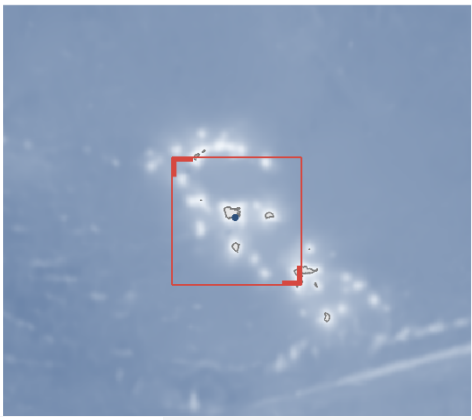
ISRA
IMPORTANT SHARK AND RAY AREAS







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

TAIOHAE ISRA

New Zealand & Pacific Islands Region

FRENCH POLYNESIA

0–50 metres

0.98 km²

SUMMARY

Taiohae is located on the southern coast of Nuku Hiva Island, in the Marquesas Archipelago of French Polynesia. The area encompasses the east part of the Taiohae Bay entrance and is characterised by a steep bathymetry with coral patches acting as cleaning stations. The area is influenced by the interaction between the seasonal increase in surface currents, the intensification of trade winds during the austral winter, and regular upwelling. This area overlaps with the Marquesas Marin Key Biodiversity Area. Within this area there are: **threatened species** (e.g., Scalloped Hammerhead *Sphyrna lewini*); **feeding areas** (Reef Manta Ray *Mobula alfredi*); and **undefined aggregations** (e.g., Scalloped Hammerhead).

CRITERIA

Criterion A – Vulnerability; Sub-criterion C2 – Feeding Areas; Sub-criterion C5 – Undefined Aggregations

DESCRIPTION OF HABITAT

Taiohae is located in the southern coast of Nuku Hiva Island, in the Marquesas Archipelago of French Polynesia. Taiohae is part of a bay situated in the old caldera of the Taiohae Volcano that created the island (Maury et al. 2014). Although the bay itself stretches ~2 km wide, the area encompasses the east part of the bay entrance, and is surrounded by steep, volcanic ridges and towering cliffs. Within the area there are several dive sites exposed to the open sea current specially at Mataua Puna Rock. The area is characterised by a steep bathymetry falling to 50 m deep with coral patches. The area maintains a water temperature of 28°C year-round, with visibility reaching up to 30 metres. The area experiences two main seasons: a hot season from December–June, and a cooler season from July–November, both influenced by the trade winds (Martinez & Maamaatuaiahutapu 2004). It is characterised by high productivity peaking during the cool season, especially between August–November, driven by intensified currents and cooler water temperatures (Martinez & Maamaatuaiahutapu 2004; Agence des Aires Marines Protégées 2016). The area is influenced by the Island Mass Effect around the Marquesas Archipelago, combined with the island's bathymetry (Martinez & Maamaatuaiahutapu 2004; French Polynesia Manta Project unpubl. data 2024).

This Important Shark and Ray Area overlaps with the Marquesas Marin Key Biodiversity Area (KBA 2024).

This Important Shark and Ray Area is benthopelagic and is delineated from inshore and surface waters (0 m) to 50 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 Critically Endangered Scalloped Hammerhead (Rigby et al. 2019) and the Vulnerable Reef Manta Ray (Marshall et al. 2022).

SUB-CRITERION C2 – FEEDING AREAS

Taiohae is an important feeding area for one ray species.

Reef Manta Rays aggregate in this area to feed near the entrance of the bay in Taiohae. Between 2015–2024, opportunistic surveys with snorkel (n = 15) and scuba (n = 9) were conducted in the area. Citizen scientists provide an additional 32 observations from the area. A total of 114 sightings comprised 102 individuals recorded via photo-identification in this area. Feeding behaviour was recorded in 50.9% (n = 59) of the observations (French Polynesia Manta Project unpubl. data 2024). Reef Manta Ray feeding aggregations were recorded in February 2020, February 2023, and April 2024; however, these aggregations are a common sight during dive surface intervals throughout the year (Nuku Dive 2024). Aggregations of up to 80–100 individuals have been observed in the area, however, average group size ranges between 15–30 individuals (A Carpentier & M Santangelo pers. obs. 2024). In 2023, during a four-day scientific expedition, 53 individuals were photo-identified during feeding aggregations in the area (A Carpentier unpubl. data. 2024). Feeding aggregations in this area represent the highest recorded numbers of individuals across the entire Marquesas Archipelago.

The feeding aggregations in this area may be linked to the increased productivity due to the interaction between the seasonal increase in surface currents, the intensification of trade winds during the winter, and the islands' topography favouring upwelling throughout the year (Martinez & Maamaatuaiahutapu 2004; Agence des Aires Marines Protégées 2016).

SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Taiohae is an important area for undefined aggregations of one shark and one ray species.

From July 2011 to April 2018, a citizen science initiative through the Observers of the Polynesian Shark Observatory conducted 12 dives in Taiohae (Séguigne et al. 2023; Séguigne unpubl. data 2024). Divers recorded the date, time, site location, species, visually estimated sizes, sex, and estimated/counted number of individuals during a 50–60 min dive (Séguigne et al. 2023). Scalloped Hammerhead were observed in nine of the 12 (75%) dives conducted in the area (Séguigne et al. 2023). Overall, 44 individuals were reported, including eight sightings of between three and nine individuals during a single dive (mean = 4.8 ± 3.22 SD) (Séguigne unpubl. data 2024).

Scalloped Hammerheads are found in the area year-round, with peak aggregations observed between May–November (Lagouy 2010; J Cherais-Nuku Dive pers. comm. 2024). Between December 2022 and December 2023, Scalloped Hammerheads were observed monthly by a dive centre conducting recreational dives (~22 per month) in the area (Nuku Dive 2024). Aggregation size varied across the year. During monthly dives undertaken between January to April 2023, 2–3 individuals were occasionally sighted together (J Cherais-Nuku Dive pers. comm. 2024). Between May–August, aggregations of 4–17 individuals were observed, and between September–November, aggregation size increased to 20–30 individuals. Male-dominated groups were observed year-round, except in larger groups (>15 individuals), where a few females were present (J Cherais-Nuku Dive pers. comm. 2024). Additionally, in February 2020, a scientific expedition using scuba was conducted in the area with daily dives during a 10-day period (A Carpentier pers. obs. 2024). During this period, aggregations of 2–3 Scalloped Hammerheads were observed almost daily at Mataua Puna Rock, within the area (A Carpentier unpubl. data. 2024).

Historically, the area was renowned for its high likelihood of Scalloped Hammerhead aggregations (Taquet et al. 2016), with sightings of one or several individuals occurring on 70% of dives (Centre de Plongée Marquises 2006). Scalloped Hammerhead aggregations are regularly observed at <27 metres depth and can be seen as shallow as 15 metres (Centre de Plongée Marquises 2006). The Scalloped Hammerhead aggregations recorded in this area are regular and predictable and more frequent than in adjacent areas: only occasional sightings are recorded from other dive sites along Nuku Hiva's south coast (J Cherais-Nuku Dive pers. comm. 2024). Cleaning behaviour has been recorded for three individuals (A Carpentier pers. obs. 2024). Further information is required to determine the nature and function of these aggregations.

Reef Manta Rays can be seen in this area year-round. Aggregations of 10–20 individuals can be predictably observed at the water surface between July–November (Lagouy 2010; A Carpentier pers. obs. 2024). Between 2013–2015, Reef Manta Rays were recorded in five of the 12 dives conducted in the area by citizen scientists (Séguigne et al. 2023) with 21 individuals sighted, including two separate dives where nine individuals were observed during each dive (Séguigne unpubl. data 2024). Scientific expeditions using snorkel and scuba were carried out in the area in February 2020 and February 2023 (A Carpentier pers. obs. 2024). In 2020, daily dives during a 10-day period recorded Reef Manta Rays during each dive (>10 dives) at a cleaning station within the area, with sightings comprising up to eight individuals at one time (A Carpentier unpubl. data. 2024). In 2023, two individuals were photo-identified while cleaning during a four-day scientific expedition (French

Polynesia Manta Project unpubl. data 2023). Additionally, between February and March in 2024, 14 Reef Manta Rays were photo-identified in the area while cleaning (French Polynesia Manta Project unpubl. data 2024). There is site fidelity to this area as 9.9% (n = 10) of the identified population was re-sighted at least once in the area, however the data collected at this site is short-term (a few survey days per year) and does not allow an accurate representation of the re-sighting ratio in this area (A Carpentier pers. obs. 2024). Re-sighted individuals were observed up to three times in a four-day period in 2023. In the long-term, two individuals were identified in 2017 and re-sighted in 2023, and one individual was sighted four times between 2020 and 2023 (A Carpentier unpubl. data 2024).

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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												
Sphyrna lewini	Scalloped Hammerhead	CR	0-1,043	X						X		
RAYS												
Mobula alfredi	Reef Manta Ray	VU	0-711	X			X			X		

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Carcharhinus melanopterus	Blacktip Reef Shark	VU
Triaenodon obesus	Whitetip Reef Shark	VU
RAYS		
Aetobatus ocellatus	Spotted Eagle Ray	EN
Taeniurops 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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