

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

## TIKEHAU ATOLL ISRA

### New Zealand & Pacific Islands Region

#### SUMMARY

Tikehau Atoll is located at the northwest end of the Tuamotu Archipelago in French Polynesia. The area encompasses the Tuheiava Pass, a section of the lagoon, and Motu Mau (Mau Islet). The area is characterised by a mixture of coral reefs and sandy substrates interspersed with patches of seagrass and algae. The area is influenced by trade winds blowing mainly from the northeast in austral summer and from the southeast in winter, and by the Equatorial Counter Current. Within this area there are: **threatened species** (e.g., Silvertip Shark *Carcharhinus albimarginatus*) and **undefined aggregations** (e.g., Reef Manta Ray *Mobula alfredi*).

#### CRITERIA

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

FRENCH  
POLYNESIA

0-750 metres

50.44 km<sup>2</sup>





## DESCRIPTION OF HABITAT

Tikehau Atoll is located at the northwestern end of the Tuamotu Archipelago in French Polynesia. The area encompasses the Tuheiava Pass, a section of the lagoon, and Motu Mauu (Mauu Islet). Tuheiava Pass is the only main channel connecting the lagoon to the open ocean; it is located on the western part of the atoll rim and has depths ranging from 4–10 m (Boube et al. 2023). At the entrance of the channel to the open ocean, depths drop to 40 m. The atoll's circumference consists of a large, lithified reef flat that is slightly above sea level for most of the year, but oceanic water overflows during high tides or rough seas through shallow (<1 m deep) channels (Rougerie et al. 2004; Boube et al. 2023). The lagoon within the area reaches depths of 50 m, and the waters around Motu Mauu, located in the lagoon, have several coral formations. The area is characterised by a mixture of coral reefs and sandy substrates interspersed with patches of seagrass and algae (K Burkhardt pers. obs. 2024). The rainy season occurs during the summer (December–February) (Rougerie et al. 2004). Speeds of the trade winds in the atoll average 10–20 knots, blowing mainly from the northeast in summer and from the southeast in winter (Rougerie et al. 2004). The area is influenced by the Equatorial Counter Current, especially in summer, bringing warm, low-salinity waters to the area (Rougerie et al. 2004).

This area overlaps with the Tikehau Marine Key Biodiversity Area (KBA; KBA 2024).

This Important Shark and Ray Area is benthopelagic and is delineated from inshore and surface waters (0 m) to 750 m based on the bathymetry of the area.

## ISRA CRITERIA

### CRITERION A – VULNERABILITY

Five Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occur in the area. Threatened sharks comprise one Critically Endangered species, one Endangered species and two Vulnerable species; threatened rays comprise one Vulnerable species (IUCN 2024).

### SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Tikehau Atoll is an important area for undefined aggregations of four shark and one ray species.

From July 2011 to April 2018, a citizen science initiative through the Observers of the Polynesian Shark Observatory conducted 611 dives in Tikehau Atoll (Séguigne et al. 2023; C Séguigne unpubl. data 2024). Divers recorded the date, time, site location, species, visually estimated sizes, sex, and estimated/counted number of individuals during 50–60 min dives (Séguigne et al. 2023).

Between 2011–2018, Silvertip Sharks were recorded on 130 dives (~21%) (Séguigne et al. 2023). Overall, 342 individuals were reported, including 67 sightings (51.5% of the sightings) of between three and six individuals during a single dive (mean =  $3.73 \pm 0.82$  SD) (C Séguigne unpubl. data 2024). These observations were recorded in 2011 (n = number of sightings of more than three individuals, 11), 2012 (n = 30), 2013 (n = 23), 2017 (n = 2) and 2018 (n = 1) (Séguigne et al. 2023). Silvertip Sharks are present in the area year-round, especially during sunset hours (Raia Manta Diving Tikehau 2024), however, sightings of several individuals were more frequent between December–February across the years (Séguigne et al. 2023). The area may also serve as a cleaning station for the species as recorded by divers with up to six individuals getting cleaned (records of three individuals in the same

frame) (Tikehau Diving 2024). Further information is required to confirm the nature of these undefined aggregations for this species.

Between 2011–2017, Grey Reef Sharks were recorded on 89 dives (~14.42%) (Séguigne et al. 2023). Overall, 708 individuals were reported, including 70 sightings (78.6% of the sightings) of 3–76 individuals during a single dive (mean =  $9.71 \pm 9.29$  SD) (C Séguigne unpubl. data 2024). These observations were recorded in 2011 (n = 5 sightings of more than three individuals), 2012 (n = 7), 2013 (n = 18), 2015 (n = 9) and 2017 (n = 31) (Séguigne et al. 2023). Sightings of several Grey Reef Sharks in the same dive were more frequent during the months of November and December across the years (Séguigne et al. 2023). Additionally, in October 2017, 15 baited remote underwater video stations (BRUVs) were placed along the outer reef of the west side of the atoll within the area (Farabaugh et al. 2024). Videos were processed using MaxN, the maximum number of individuals of a species observed in a single frame. Grey Reef Sharks were recorded on 11 of the deployments with a maximum MaxN of five individuals (mean =  $2.7 \pm 1.05$  sharks) (Farabaugh et al. 2024). Further information is required to confirm the nature of these undefined aggregations for this species.

Between 2012–2017, Blacktip Reef Sharks were recorded on 30 dives (~4.86%) (Séguigne et al. 2023). Overall, 161 individuals were reported, including 18 sightings (60% of the sightings) of between three and 13 individuals during a single dive (mean =  $8 \pm 2.92$  SD) (C Séguigne unpubl. data 2024). These observations were recorded in 2012 (n = 3 sightings of more than three individuals), 2013 (n = 11), 2017 (n = 4), (Séguigne et al. 2023). Additionally, in October 2017, 39 Blacktip Reef Sharks were recorded on 13 of the BRUVs deployments with a maximum MaxN of five individuals (mean =  $3 \pm 1.03$  sharks) (Farabaugh et al. 2024). Tikehau Atoll had the highest mean MaxN (used as the index for relative abundance) across all islands surveyed in French Polynesia in 2017 (Farabaugh et al. 2024). Further information is required to confirm the nature of these undefined aggregations for this species.

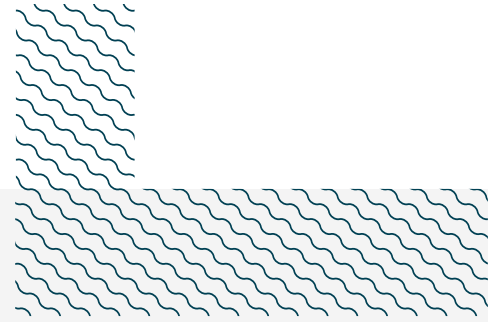
Great Hammerheads are observed in the area every year between November–July (T Boube pers. obs. 2024), although most sightings occur between December–February. Females are primarily sighted between November–May (Boube et al. 2023). Between 2012–2018, Great Hammerheads were recorded on 49 dives (~8%) (Séguigne et al. 2023). Overall, 80 individuals were reported, including four sightings (8.2% of the sightings) of 4–13 individuals during a single dive (mean =  $7.5 \pm 3.7$  SD) (C Séguigne unpubl. data 2024). These observations were recorded in 2012 (n = 2 sightings of more than three individuals), 2013 (n = 1), 2015 (n = 1) (Séguigne et al. 2023). Additionally, between January and February 2021, 23 research dives were conducted over 15 days in the area and between December 2023 and February 2024, 16 research dives were carried out during incoming currents. Photo-identification was used to record Great Hammerhead individuals (using natural markings, fin morphology, scars, and ventral pigmentation) and laser photogrammetry to measure their size (Boube et al. 2023). The number of sharks was determined based on identifiable individuals and those sighted simultaneously. In 2021, five female Great Hammerheads were identified in 23 sightings across 11 research dives (47.8%) (Boube et al. 2023). Despite typically being a solitary species (Rigby et al. 2019; Ebert et al. 2021), up to four individuals were observed in a single dive (n = 11) across the small pass in the area (Boube et al. 2023). Sizes ranged between 225–264 cm precaudal length ( $248.3 \pm 15.9$  cm; n = 4 sightings) (Boube et al. 2023). Size-at-maturity for the species is 210–300 cm total length for females (Ebert et al. 2021), indicating that these were adults. During 2023–2024, Great Hammerheads were observed on nine out of 16 research dives, with 1–3 individuals sighted per dive (T Boube pers. obs. 2024). Further, between February 2023 and March 2024, five Great Hammerheads were tagged with passive acoustic transmitters. Four of these were detected within the area for 14 consecutive days, with detection periods ranging from 14–190 days and detection counts varying between 151–6,274, indicating high residency to the area (T Boube unpubl. data 2024). Additionally, local knowledge from divers indicates consistent sightings every year from November

to July, and during 2024 local dive guides in the area have reported daily sightings from March through June (T Boube unpubl. data 2024). Further information is required to confirm the nature and function of these undefined aggregations.

The area encompasses a cleaning station for Reef Manta Rays around coral reef formations, where courtship and feeding behaviour has also been observed. Between 2012–2017, Reef Manta Rays were recorded on 62 dives (~10%) (Séguigne et al. 2023). Overall, 305 sightings were reported, including 32 sightings (51.61% of the sightings) of 3–13 individuals during a single dive (mean =  $7.5 \pm 3.69$  SD) (C Séguigne unpubl. data 2024). These observations were recorded in 2012 (n = 11 sightings of more than three individuals), 2013 (n = 21), 2015 (n = 2), 2016 (n = 1) and 2017 (n = 1) (Séguigne et al. 2023). Sightings of several Reef Manta Rays in the same dive were more frequent during the months of June–August across the years (Séguigne et al. 2023).

Additionally, between 2009–2024, citizen scientists and researchers collected opportunistic data on Reef Manta Ray sightings using snorkel and scuba surveys in this area (Carpentier et al. 2019; Carpentier 2023; A Carpentier & V Poly pers. obs. 2024). Overall, 268 photo-identification sighting records were collected, comprising 107 individuals identified via photo-identification in Tikehau Atoll (Carpentier et al. 2019; Carpentier 2023; French Polynesia Manta Project, unpubl. data 2024). Connectivity between the cleaning station within the lagoon (Motu Mauu) and the atoll pass (Tuheiava Pass) was confirmed through photo-identification of six individual Reef Manta Rays, using these two habitats within the area (French Polynesia Manta Project, unpubl. data 2024). Cleaning behaviour was observed in 56.3% (n = 143) of the sightings with a maximum of 13 individuals recorded in one morning (ORP unpubl. data 2024). Emigration-re-immigration models using maximum-likelihood values showed that this cleaning station may host the largest Reef Manta Ray population in the Society and Tuamotu Archipelagos with an average daily abundance of 35 individuals ( $35.37 \pm$  SE 13.56, 95% CI 9.96–63.77) and individual residency to the area of 70.80 ( $\pm$  SE = 129.11) days (Carpentier et al. 2019).

The nature and function of these Reef Manta Ray aggregations may also be for reproductive and or feeding purposes. Between 2018–2024, seven courtship trains were documented at the cleaning station, with 2–6 males following one female. On two occasions, the females engaging in the courtship were considered pregnant based on their distended abdomens. Further, from 2011–2023, six different pregnant females and two young-of-the-year individuals (measuring <200 cm disc width, with light-coloured patterns on the back and belly spots) were recorded in this area (Carpentier 2023; French Polynesia Manta Project unpubl. data 2024). Size-at-birth for this species in the wild is 130–150 cm DW (Marshall et al. 2010). Feeding behaviour has also been observed on nine occasions in this area between 2011–2023 (Carpentier 2023; French Polynesia Manta Project unpubl. data 2024).



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### **Acknowledgments**

Alice Carpentier (Manta Trust; Observatoire des Requins de Polynésie), Virginie Poly (Manta Trust), Fanny Martre (Direction de l'Environnement de Polynésie Française), Maya Santangelo (Manta Trust), Tatiana Boube (University of French Polynesia), Clémentine Séguigne (IREMP), Kori Burkhardt (Ma'o Mana Foundation with Direction de l'Environnement Polynésie Française), and Marta D Palacios (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.

This factsheet has undergone review by the ISRA Independent Review Panel prior to its publication.

This project was funded by the Shark Conservation Fund, a philanthropic collaborative pooling expertise and resources to meet the threats facing the world's sharks and rays. The Shark Conservation Fund is a project of Rockefeller Philanthropy Advisors.

### **Suggested citation**

**IUCN SSC Shark Specialist Group. 2024.** Tikehau Atoll ISRA Factsheet. Dubai: IUCN SSC Shark Specialist Group.

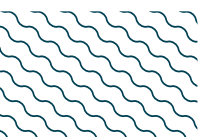
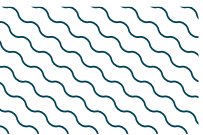
## QUALIFYING SPECIES

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 albimarginatus</i>	Silvertip Shark	VU	0-800	X							X		
<i>Carcharhinus amblyrhynchos</i>	Grey Reef Shark	EN	0-280	X							X		
<i>Carcharhinus melanopterus</i>	Blacktip Reef Shark	VU	0-100	X							X		
<i>Sphyrna mokarran</i>	Great Hammerhead	CR	0-300	X							X		
<b>RAYS</b>													
<i>Mobula alfredi</i>	Reef Manta Ray	VU	0-711	X							X		

## SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
<b>SHARKS</b>		
<i>Carcharhinus limbatus</i>	Blacktip Shark	VU
<i>Galeocerdo cuvier</i>	Tiger Shark	NT
<b>RAYS</b>		
<i>Aetobatus ocellatus</i>	Spotted Eagle Ray	EN
<i>Pateobatis fai</i>	Pink Whipray	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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