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

MAYOTTE ISRA

Western Indian Ocean Region

SUMMARY

Mayotte is located around the volcanic island of Mayotte that is part of the Comoros archipelago in the northern Mozambique Channel, between Madagascar and Mozambique. The area lies within a region of two main islands and numerous islets within a vast lagoon surrounded by a 140 km long barrier reef. The area is characterised by a range of habitats inside and outside the lagoon, such as fringing reefs, seagrass beds, sand flats and mangrove forests, barrier reefs intersected by lagoonal passes, and pelagic waters. The area also overlaps with the Parc Naturel Marin de Mayotte. Within this area there are: **threatened species** (e.g., Grey Reef Shark *Carcharhinus amblyrhynchos*); **reproductive areas** (e.g., Blacktip Reef Shark *Carcharhinus melanopterus)*; **feeding areas** (Reef Manta Ray *Mobula alfredi*); and **undefined aggregations** (e.g., Scalloped Hammerhead *Sphyrna lewini*).

CRITERIA

Criterion A – Vulnerability; Sub-criterion C1 – Reproductive Areas; Sub-criterion C2 – Feeding Areas; Sub-criterion C5 – Undefined Aggregations

FRANCE

0–1,043 metres

596.83 km²

sharkrayareas.org

DESCRIPTION OF HABITAT

Mayotte is located around the volcanic island of Mayotte that is part of the Comoros archipelago in the northern Mozambique Channel. The area comprises five distinct locations that lie within a region of two main islands and are connected by a vast lagoon that spans >1,300 km² and is surrounded by a ~140 km coral barrier reef (Chevalier et al. 2017). Outside the reef, the seafloor drops to >3,000 m, while inside the shallow lagoon, the maximum depth is ~80 m (Zinke et al. 2003). The South Equatorial Current flows around the northern tip of Madagascar and splits at the African mainland, creating a large gyre in the northern entrance of the Mozambique Channel from which eddies form that then flow southward through the Channel (Schouten et al. 2003).

The surrounding region, including Mayotte, is characterised by its oligotrophic dynamics. The lagoon is heavily influenced by tidal water exchange flowing in and out through the passes in the reef (Chevalier et al. 2017). Water is exchanged frequently near the passes, for example in the northeast of the lagoon, while in the central lagoon water residency is longer, increasing primary productivity in the lagoon to above what would be expected from such an oligotrophic system (Chevalier et al. 2017). The area comprises a range of habitats including coastal fringing reefs, internal reefs within the lagoon, coral barrier reefs, seagrass beds, sand flats, mangrove forests, lagoonal passes, and pelagic waters (Chevalier et al. 2017, Moussa et al. 2020).

Mayotte is encompassed by the Parc Naturel Marin de Mayotte (a marine protected area) which covers the entire exclusive economic zone of Mayotte (69,000 km²). It overlaps with the Mayotte Marine Natural Park Key Biodiversity Area (KBA 2023) and lies within the Northern Mozambique Channel and the Mozambique Channel Ecologically or Biologically Significant Marine Areas (EBSAs; CBD 2023a, 2023b).

This Important Shark and Ray Area is benthopelagic and extends from inshore and surface waters (0 m) to 1,043 m based on the bathymetry of the area and the global depth range of the Qualifying Species.

ISRA CRITERIA

CRITERION A – VULNERABILITY

Four Qualifying Species within the area are considered threatened with extinction according to IUCN Red List of Threatened Species™. These are the Critically Endangered Scalloped Hammerhead (Rigby et al. 2019), the Endangered Grey Reef Shark (Simpfendorfer et al. 2020a), and the Vulnerable Blacktip Reef Shark (Simpfendorfer et al. 2020b) and Reef Manta Ray (Marshall et al. 2022).

SUB-CRITERION C1 – REPRODUCTIVE AREAS

Mayotte is an important reproductive area for one shark and one ray species.

Neonate Blacktip Reef Sharks are frequently observed in the area. The TsiÔno citizen science network recorded 97 observations of 347 individuals since 2014 (V Marillac unpubl. data 2023). Most sightings were recorded in two small areas close to shore, off the northwest and southeast coast of the island of Mayotte. More than half (56%) of the individuals were classified as neonates based on visual estimates of their size. Regional references show their size-at-birth is 46–52 cm total length

(TL; Fourmanoir 1961, Stevens 1984) and individuals <50 cm TL were therefore considered to be neonates. Neonates were seen in groups of up to 20 individuals (mean aggregation size = 4.6 individuals), swimming or resting; feeding was also observed at some sites. Neonates were recorded annually between 2014–2023 and most (94%) sightings were recorded between April and September. Additionally, local fishers and boat operators have regularly reported the presence of juveniles in the area at a popular beach in Petite Terre.

The regular occurrence of neonates and young-of-the-year (YOY) Reef Manta Rays has been reported from the area. The TsiÔno citizen science network has recorded 142 observations of 198 individuals since 2012, all with an estimated size of <200 cm disc width (DW; V Marillac unpubl. data 2023), and some with the presence of fresh umbilical scars. The reported size-at-birth for this species in the wild is 130–150 cm DW (Marshall et al. 2022), and a male born in human care at 182 cm DW measured 261 cm DW at 10-months-old (Nozu et al. 2017; Murakumo et al. 2020). Considering the size-at-birth and this rapid initial growth, we considered all individuals <=200 cm DW to be neonates or YOY. Reports of neonates and YOY have been made annually since 2012 and show a seasonal peak from March–July (80% of records), with sightings predominantly from Handréma Bay in the northeast of the island. Four neonates/YOY were identified during two scientific surveys in April 2019 and March/April 2023, all in Handréma Bay. One individual sighted in 2019 had an estimated size of 180 cm DW, and three individuals sighted in 2023 were regularly seen over the two-week survey and had an estimated size of 140 cm, 150 cm, and 180 cm DW. Fresh umbilical scars and creases at the base of the pectoral fins were also evident in these individuals, supporting the evidence that these were neonates. Few adults or larger juveniles were seen in the same area of the neonates. Although no pregnant females or mating events were reported, the regular occurrence, site fidelity, and specific habitat use of neonates indicate that Mayotte is a nursery area for this species (Heupel et al. 2007).

SUB-CRITERION C2 – FEEDING AREAS

Mayotte is an important feeding area for one ray species.

Citizen science observations of Reef Manta Rays through the TsiÔno network have recorded feeding behaviour in 77% of total observations (375 out of 489 total sightings recorded since 2012). A scientific survey in 2023 recorded feeding behaviour in 68% of all sightings (n = 25) over a two-week period. Reef Manta Rays were mostly surface feeding, often with pectoral fin tips breaking the surface (C Rohner pers. obs. 2023). The number of individuals reported together was higher during feeding events (mean = 1.7 individuals, max. = 12 individuals), compared to when no feeding was observed (mean = 1.4, max. = 5). The main feeding locations included Baie d'Handréma where neonates often feed (see C1), and the reefs around the main channel into the lagoon in the northeast of the reef. Although no dedicated plankton studies have been conducted, local tour operators visit these reefs because of the high frequency of feeding manta rays. Here, complex reef formations form bays and channels where zooplankton gets concentrated with the tidal currents, which are particularly strong in this location (Chevalier et al. 2017).
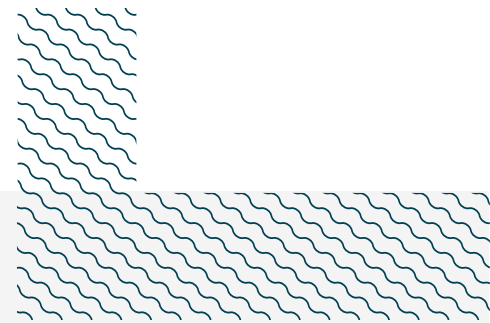
SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

This is an important area for undefined aggregations of two shark species.

Aggregations of Grey Reef Sharks have been reported year-round during 2015–2022 by citizen scientists, with groups of up to 30 individuals (mean = 6 individuals; 62 observations of >3 individuals;

V Marillac unpubl. data 2023). Aggregations were observed in the coral reef passes in the southwest of the area, predominantly in the "S" pass.

Scalloped Hammerheads are observed by divers seasonally, predominantly between August and October, in pelagic waters and the outer edge of the barrier reef in the northwest of the area. Citizen science data collected between 2015–2022 recorded a total of 19 aggregations of 2–70 individuals, with a mean group size of 17 individuals (V Marillac unpubl. data 2023). More than 10 individuals were recorded in 42% of aggregations.

Further information is required to understand the function of these aggregations.

Suggested citation

IUCN SSC Shark Specialist Group. 2023. Mayotte 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
SHARKS												
Carcharhinus amblyrhynchos	Grey Reef Shark	EN	0–280	X						X		
Carcharhinus melanopterus	Blacktip Reef Shark	VU	0–75	X		X						
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 leucas	Bull Shark	VU
Galeocerdo cuvier	Tiger Shark	NT
Triaenodon obesus	Whitetip Reef Shark	VU
RAYS		
Aetobatus ocellatus	Spotted Eagle Ray	EN
Himantura uarnak	Coach Whipray	EN
Pastinachus ater	Broad Cowtail Ray	NT
Rhynchobatus djiddensis	Whitespotted Wedgefish	CR
Taeniura lymma	Bluespotted Lagoon Ray	NT
Taeniurops meyeni	Blotched Fantail Ray	VU
Urogymnus asperrimus	Porcupine Ray	EN

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.
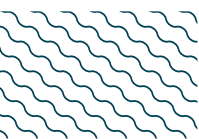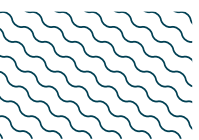
SUPPORTING INFORMATION
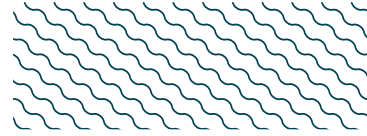
There are additional indications that Mayotte is an important area for Reef Manta Rays. The TsiÔno citizen science network has been operating in Mayotte since 2015, supported by the Marine Park of Mayotte. It enables anyone to report their observations of marine species in Mayotte's lagoon on the TsiÔno portal (app and website), including marine mammals, sharks and rays, emblematic fish, invertebrates, seabirds, and sea turtles.

Citizen science data collected through the TsiÔno network allowed the Parc Naturel Marin de Mayotte to create a photo-identification catalogue of Reef Manta Rays, which has identified 27 individuals to date. Photographic recaptures of individuals show that individuals exhibit site fidelity, returning to Mayotte over multiple years.
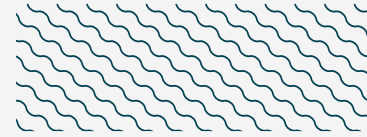
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