

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

## GREATER BAZARUTO ISRA

### Western Indian Ocean Region

#### SUMMARY

Greater Bazaruto is located on the northern coast of Mozambique’s Inhambane Province in the southwest of the Mozambique Channel. The area encompasses an archipelago of five islands (Bazaruto Archipelago) and a diversity of coastal and benthic habitats including subtropical rocky reefs, coral reefs, tidal sand flats, seagrass beds, estuaries, and mangrove ecosystems. The area overlaps with two Ecologically or Biologically Significant Marine Areas, the Greater Bazaruto Key Biodiversity Area, the Bazaruto Archipelago National Park, and the Vilanculos Coastal Wildlife Sanctuary. Within this area there are: **threatened species** (e.g., Bull Shark *Carcharhinus leucas*); **range-restricted species** (Greyspot Guitarfish *Acroteriobatus leucospilus*); **feeding areas** (Reef Manta Ray *Mobula alfredi*); **resting areas** (Bottlenose Wedgefish *Rhynchobatus australiae*); **undefined aggregations** (e.g., Scalloped Hammerhead *Sphyrna lewini*); and **areas with distinctive attributes** (e.g., Smalleye Stingray *Megatrygon microps*).

#### CRITERIA

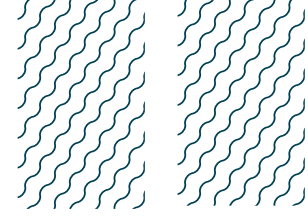
**Criterion A - Vulnerability; Criterion B - Range Restricted;**  
**Sub-criterion C2 - Feeding Areas; Sub-criterion C3 - Resting Areas;**  
**Sub-criterion C5 - Undefined Aggregations; Sub-criterion D1 - Distinctiveness**

— —  
**MOZAMBIQUE**

— —  
**0-300 metres**

— —  
**5,578.68 km<sup>2</sup>**





## DESCRIPTION OF HABITAT

Greater Bazaruto is located along the southern coast of Mozambique in the Western Indian Ocean. This area includes an archipelago of five islands (Bazaruto Archipelago) and the San Sebastian Peninsula. The leeward side of the archipelago is characterised by extensive and dynamic tidal sand flats, with interspersed seagrass beds, coral and rocky reefs, and coastal mangrove ecosystems (Bandeira et al. 2008). The San Sebastian Peninsula includes a range of habitats including coastal dunes, mangroves, and estuaries. The seaward side is characterised by pelagic waters with shallow (8-15 m) coral reefs along the island and underlying subtropical rocky reefs (20-40 m) extending parallel to shore surrounded by sandy substrate (Venables et al. 2022). The continental shelf is narrow with a steep slope, leading to shelf-edge upwelling that increases plankton biomass and creates large prey aggregation areas for filter feeders (Vinayachandran et al. 2021). Mesoscale cyclonic/anticyclonic eddies move southward through the Mozambican Channel, driving frequent and pronounced coastal upwelling in the area (Roberts et al. 2014).

The area overlaps with two protected areas: the Bazaruto Archipelago National Park and the Vilanculos Coastal Wildlife Sanctuary. It also overlaps with two Ecologically or Biologically Significant Marine Area (EBSAs; Save River to San Sebastian and Mozambique Channel; CBD 2023a, 2023b) and with the Greater Bazaruto Key Biodiversity Area (KBA 2023).

This Important Shark and Ray Area is benthopelagic and extends from inshore and surface waters (0 m) to 300 m based on the bathymetry of the area.

## ISRA CRITERIA

### CRITERION A - VULNERABILITY

Twelve 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 one Vulnerable species; threatened rays comprise one Critically Endangered species, five Endangered species, and three Vulnerable species (IUCN 2023).

### CRITERION B - RANGE RESTRICTED

This area holds the regular presence of the Greyspot Guitarfish as a resident range-restricted species. Greyspot Guitarfish are sighted in shallow sandy habitats throughout the area, particularly on the leeward side of the Bazaruto Archipelago. Opportunistic visits to local fish markets and landing sites on the mainland coast of the area (~10-15 times per year during 2018-2023) found this to be among the most frequently landed species of shark or ray (A Marshall & J Conradie pers. obs. 2023). Greyspot Guitarfish only occur in the Agulhas Current Large Marine Ecosystem.

### SUB-CRITERION C2 - FEEDING AREAS

Greater Bazaruto is an important feeding area for one ray species.

Aerial surveys conducted between 2012-2014 (n = 9) recorded 183 Reef Manta Ray sightings in the area, and feeding was observed in almost all (96%) sightings (Marine Megafauna Foundation unpubl.

data 2023). On four occasions, large groups (15, 25, 40, and 80 individuals) were actively surface and sub-surface feeding. This species was also observed surface or sub-surface feeding during boat-based surveys every year (2013–2022), albeit in smaller groups (1–5 individuals) than recorded in aerial surveys (Marine Megafauna Foundation unpubl. data 2023). This feeding behaviour is likely to be associated with the frequent and intense upwelling events occurring in the area year-round and supporting high productivity on the shelf (Roberts et al. 2014).

## SUB-CRITERION C<sub>3</sub> – RESTING AREAS

Greater Bazaruto is an important resting area for one ray species.

Dive surveys have recorded 262 sightings of Bottlenose Wedgefish in this area, with sightings every year from 2013–2023 (Marine Megafauna Foundation unpubl. data 2023). Few sightings (n = 35) were recorded between 2013–2019. After 2020, when dedicated survey effort began for this species, a mean of 57 sightings per year were recorded (range 46–80 sightings per year). In 60% of sightings for which behaviour was recorded (n = 129), the species was resting in sandy substrate. Resting behaviour was observed at two main sites, one of which is a shallow (<8 m) tidal estuary mouth where they rest around low and high tide, when the current is weakest. Groups of up to 30 individuals have been observed resting and regular sightings of 4–10 individuals have been recorded during drone and snorkel surveys at this site. Resting is also observed on sand flats adjacent to a rocky reef that acts as a cleaning station for the species. Here, individuals rest in groups of up to seven individuals ~20 m away from the specific cleaning area. Bottlenose Wedgefish have not been observed resting at or near the other cleaning station sites in the area, where they are actively cleaning or swimming over the reef. A photo-identification study has identified >80 individuals, with a re-sighting rate of 20%, and shows evidence of individuals moving between resting sites and cleaning stations in the area (Marine Megafauna Foundation unpubl. data 2023).

## SUB-CRITERION C<sub>5</sub> – UNDEFINED AGGREGATIONS

Greater Bazaruto is an important area for undefined aggregations of three shark and five ray species.

Grey Reef Sharks regularly aggregate in this area. Dive surveys have recorded 129 sightings, with sightings every year between 2014–2022, except 2016 (Marine Megafauna Foundation unpubl. data 2023). While solitary individuals are observed (15% of total sightings), groups of up to 12 individuals have been recorded. At one rocky reef in the south of the area, multiple individuals were recorded on 90% of surveys at this site (mean = 7 individuals per dive, range = 2–12) (Marine Megafauna Foundation unpubl. data 2023). The drivers of these aggregations are unknown, but they may be associated with feeding, as this species has also been observed feeding on surface baitballs in the area.

Dive surveys recorded 334 sightings of Bull Sharks between 2013–2023, with sightings every year except 2016 (mean = 33 sightings per year; Marine Megafauna Foundation unpubl. data 2023). Bull Sharks are seen in groups of up to eight individuals at 14 sites, although 71% of sightings are from a rocky reef off northeast Bazaruto. Passive acoustic telemetry data show high residency, with individuals spending up to 79% of detected days at rocky reef sites (Marine Megafauna Foundation unpubl. data 2023). While the drivers of aggregations are currently unknown, this species has occasionally been sighted feeding on surface baitballs in the area (up to 10 individuals on a baitball,

R Daly pers. obs. 2023). Predation attempts on large rays have also been witnessed. In addition, 16 of 17 individuals acoustically tagged were female, and pregnant individuals have been observed, suggesting the area may be particularly important for females.

Dive surveys have recorded 146 sightings of Scalloped Hammerheads (69% of total sightings from the Inhambane Province), with the species seen every year between 2015–2022 (except 2016) (Marine Megafauna Foundation unpubl. data 2023). Sightings were from April to November, with higher numbers in the austral winter (June–August). Groups of up to 25 individuals were recorded (mean group size = 7 individuals). Larger groups were observed at 25–35 m rocky reef pinnacles and ridges, nearby to deep drop-offs. While the drivers of these aggregations are unknown, schooling behaviour in this species is observed in other locations (e.g., Bessudo et al. 2011) and has been linked to social and reproductive functions (Gallagher & Klimley 2018).

Spotted Eagle Rays aggregate in this area. Dive surveys recorded 626 sightings between 2013–2023, with sightings every year (except 2016), year-round, with a peak in May–July (Marine Megafauna Foundation unpubl. data 2023). Aggregations up to 60 individuals (mean = 10) have been recorded. Aerial surveys conducted in 2012–2014 (n = 9) recorded an additional 87 sightings, with the species observed travelling in groups of up to 5–7 individuals on three occasions, and a large group of 70 individuals on a single occasion (J Conradie unpubl. data 2023). Although the drivers of these aggregations remain unknown, Spotted Eagle Rays have been observed actively cleaning on reef cleaning stations (15% of sightings with a recorded behaviour [n = 249]; Marine Megafauna Foundation unpubl. data 2023).

Dive surveys recorded 304 sightings of Coach Whiprays from 2017–2023, with sightings every year, throughout the year with a peak in May–September (Marine Megafauna Foundation unpubl. data 2023). This species is almost exclusively seen in this area, with 94% of overall sightings across the Inhambane Province recorded here. The species has been reported in aggregations of up to 10 individuals (mean group size = 4.1 individuals). Although the nature and function of the aggregations are not yet understood, it is possible that they use the area to rest (85% of sightings with behaviour recorded, total n = 107) and to clean (14%), given that this species is commonly sighted at a cleaning station frequented by other rays.

Reef Manta Rays aggregate to clean in Greater Bazaruto. Dive surveys conducted between 2013–2023 have recorded 900 sightings and this species was actively cleaning in 88% of sightings where behaviour was recorded (n = 624; Marine Megafauna Foundation unpubl. data 2023). Surveys have recorded large groups (10–20 individuals) of Reef Manta Rays on 17 occasions (across multiple years) cleaning at the same time, at cleaning stations, where cleaner fishes remove parasites and dead skin off the rays. This is an important behaviour in the species, with 10 of 36 individuals tracked with passive acoustic telemetry spending >3 consecutive hours on a cleaning station (mean visit duration = 25 min, maximum = 8 h; Venables et al. 2020). Apart from the physical/health benefit, cleaning stations are also important locations for social interactions and courtship of Reef Manta Rays (Marshall & Bennett 2010; Perryman et al. 2019).

This area hosts undefined aggregations of Broad Cowtail Rays. Dive surveys recorded 305 sightings between 2013–2023, with sightings every year except 2015 and 2016 (Marine Megafauna Foundation unpubl. data 2023). Sightings were year-round, with a peak in May–August. This species is almost exclusively seen in this area, with 98% of overall sightings across the Inhambane Province recorded here. Aggregations of up to 20 individuals were observed (mean group size = 4.1 individuals). Additionally, 14 individuals were identified in a drone and snorkel survey of a shallow estuary, where this species is often encountered resting on the sandy substrate (Marine Megafauna Foundation unpubl. data 2023). The reason for their aggregations is not yet understood, although it is possible that they use the area to rest (55% of behaviours recorded, n = 66), feed (20%), and clean (20%).

Oman Cownose Rays have been sighted on 10 occasions in the area in total but are observed in large aggregations and landed in high numbers in gill and seine nets. Aerial surveys recorded groups of ~20, ~50, ~200, and ~2,000 individuals in 2012 and 2013 (Marine Megafauna Foundation unpubl. data 2023). More recently, dive surveys in 2019–2023 recorded schools of ~40, ~100, and ~200 individuals and one record of a fever comprising ~1,000 individuals (Marine Megafauna Foundation unpubl. data 2023). This species is also regularly landed in high numbers (up to 250 individuals) at nearby landing sites in Vilanculos, caught in gill and seine nets (A Marshall pers. obs. 2023).

## SUB-CRITERION D1 – DISTINCTIVENESS

Greater Bazaruto contains areas with distinctive attributes for four ray species.

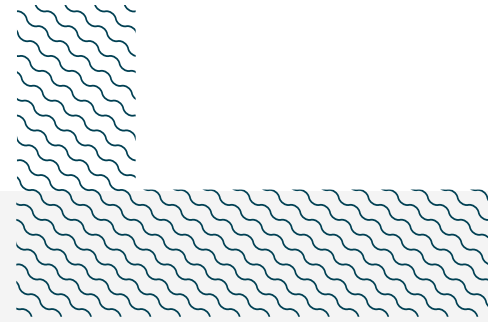
The area is an important cleaning habitat for Smalleye Stingrays. Dive surveys have recorded 24 sightings of this rare species, in 2013–2014 and 2017–2023. Sightings occurred year-round (mean = 3 sightings per year, range = 1–9), with higher numbers in the austral winter (August–September). Active cleaning was observed in 65% of sightings. The Inhambane Province is the only documented area globally where Smalleye Stingrays regularly visit cleaning stations (Boggio-Pasqua et al. 2019). Preliminary data from five individuals acoustically tagged in this area show high residency to cleaning sites e.g., two tagged males had 88% and 97% of detections at one site, over >13 months of tracking (Marine Megafauna Foundation unpubl. data 2023). Telemetry data suggest that dive surveys likely underestimate abundance of this species, as a satellite-tracked male spent 66% of the time in depths inaccessible to divers (>30 m; Marine Megafauna Foundation unpubl. data 2023). Passive acoustic telemetry data (n = 12) further support this, with 70% of detections recorded between midnight and 6 am, when observers are not on the reefs (Marine Megafauna Foundation unpubl. data 2023).

Greater Bazaruto contains important cleaning areas for Shorthorned Pygmy Devil Rays. Dive surveys have recorded 162 sightings from the area, with sightings every year from 2013–2023 (Marine Megafauna Foundation unpubl. data 2023). A cleaning station for Shorthorned Pygmy Devil Rays exists at an 8–20 m deep reef in the Bazaruto Archipelago, one of only two cleaning stations identified for this species in the Western Indian Ocean (Murie & Marshall 2016), which may be a key driver of their visitation to the area. Local dive operators visit this reef on a weekly basis and encounter this species on almost all dives (~90%) at this site (Odyssey Dive Centre pers. comm. 2023).

This is an important cleaning area for Pink Whiprays, which are sighted at rocky reefs (20–30 m deep) and on shallow tidal sand flats throughout the area. Dive surveys recorded 161 sightings (75% of overall sightings from the Inhambane Province), with sightings every year from 2019–2023 (mean = 39 sightings per year, range = 5–52). Pink Whiprays were actively cleaning at cleaning stations in 50% of sightings in which behaviour was recorded (n = 40). Remote Underwater Video cameras deployed in 2021 and 2022 recorded cleaning behaviour on ~40% of deployments (n = 30; Marine Megafauna Foundation unpubl. data 2023). Cleaning behaviour in this species has not been recorded at any other location in the province and may be unique to this area.

Bottlenose Wedgefish also use this area for cleaning behaviour. Reports of cleaning behaviour in wedgefishes are rare, and to our knowledge, the area contains some of the only identified cleaning stations for this species in the Western Indian Ocean. Dive surveys have recorded 262 sightings, with sightings every year from 2013–2023 (Marine Megafauna Foundation unpubl. data 2023). Thirty-five sightings were recorded prior to 2019. After 2020, when dedicated survey effort began for this species, a mean of 57 sightings per year were recorded (range 46–80 sightings per year). In 30% of sightings for which behaviour was recorded (n = 129), the species was observed actively cleaning at cleaning stations. These typically are specific sandy areas adjacent to rocky reefs (20–30 m deep)

that are also used as cleaning stations by other sharks and rays. Preliminary telemetry data show high residency, with three acoustically tagged individuals spending 45%, 73%, and 84% of detected days at these sites (Marine Megafauna Foundation unpubl. data 2023).



---

### **Acknowledgments**

Stephanie Venables (Marine Megafauna Foundation), Andrea Marshall (Marine Megafauna Foundation; IUCN SSC Shark Specialist Group), Janneman Conradie (Marine Megafauna Foundation), Ryan Daly (Oceanographic Research Institute), Tessa N. Hempson (Mission Blue; James Cook University), Simon Pierce (Marine Megafauna Foundation; IUCN SSC Shark Specialist Group), Anna Flam (Marine Megafauna Foundation), and Christoph A. Rohner (IUCN SSC Shark Specialist Group - ISRA Project) contributed and consolidated information included in this factsheet. We thank all participants of the 2023 ISRA Region 7 - Western Indian Ocean 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. 2023.** Greater Bazaruto 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
<b>SHARKS</b>											
<i>Carcharhinus amblyrhynchos</i>	Grey Reef Shark	EN	0-280	X						X	
<i>Carcharhinus leucas</i>	Bull Shark	VU	0-256	X						X	
<i>Sphyrna lewini</i>	Scalloped Hammerhead	CR	0-1,043	X						X	
<b>RAYS</b>											
<i>Acroteriobatus leucospilus</i>	Greyspot Guitarfish	EN	0-100	X	X						
<i>Aetobatus ocellatus</i>	Spotted Eagle Ray	EN	0-40	X						X	
<i>Himantura uarnak</i>	Coach Whipray	EN	0-50	X						X	
<i>Megatrygon microps</i>	Smalleye Stingray	DD	0-200								X
<i>Mobula alfredi</i>	Reef Manta Ray	VU	0-711	X			X			X	
<i>Mobula kuhlii</i>	Shorthorned Pygmy Devil Ray	EN	0-50	X							X
<i>Pastinachus ater</i>	Broad Cowtail Ray	VU	0-60	X						X	
<i>Pateobatis fai</i>	Pink Whipray	VU	0-200	X							X
<i>Rhinoptera jayakari</i>	Oman Cownose Ray	EN	0-50	X						X	
<i>Rhynchobatus australiae</i>	Bottlenose Wedgefish	CR	0-60	X				X			X

## SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
<b>SHARKS</b>		
<i>Carcharhinus limbatus</i>	Blacktip Shark	VU
<i>Carcharhinus melanopterus</i>	Blacktip Reef Shark	VU
<i>Galeocerdo cuvier</i>	Tiger Shark	NT
<i>Nebrius ferrugineus</i>	Tawny Nurse Shark	VU
<i>Rhincodon typus</i>	Whale Shark	EN
<i>Stegostoma tigrinum</i>	Indo-Pacific Leopard Shark	EN
<i>Triacnodon obesus</i>	Whitetip Reef Shark	VU
<b>RAYS</b>		
<i>Aetomylaeus vespertilio</i>	Ornate Eagle Ray	EN
<i>Mobula birostris</i>	Giant Manta Ray	EN
<i>Pateobatis jenkinsii</i>	Jenkins' Whipray	EN
<i>Rhina ancylostomus</i>	Bowmouth Guitarfish	CR
<i>Rhynchobatus djiddensis</i>	Whitespotted Wedgefish	CR
<i>Taeniurops meyeri</i>	Blotched Fantail Ray	VU
<i>Urogymnus asperrimus</i>	Porcupine Ray	EN

*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.*





## SUPPORTING INFORMATION

There are additional indications that Greater Bazaruto is an important area for aggregations and reproductive purposes of two shark and four ray species. Sightings data are from dive surveys ( $n = 1,017$ ) conducted by researchers. For most species, data were collected on scuba. Here, the data are similar to an underwater visual census (UVC) whereby an observer records species during a dive, without following a particular transect or staying stationary. A 'sighting' is of a single individual. Some species were also recorded from a boat or on snorkel (referred to as 'surface sightings'). Data were collected from 2013–2023. Survey effort varied slightly across years, with dedicated and consistent survey effort in 2014 and from 2019 onwards and more opportunistic surveys (<60 surveys per year) in 2013, 2015–2018.

There is some evidence that Greater Bazaruto is also an important area for aggregations of Blacktip Sharks, but further research is needed to confirm this. Dive surveys have recorded 69 sightings of Blacktip Sharks in the area, with this species sighted every year between 2014–2022, except 2016. While most observations are of solitary individuals, up to four Blacktip Sharks have been seen on a dive survey (Marine Megafauna Foundation unpubl. data 2023). Additionally, this species is regularly observed feeding on surface baitballs in numbers of ~10–20 individuals (A Marshall pers. obs. 2023).

Indo-Pacific Leopard Sharks are sighted at rocky reefs in 20–30 m depth throughout the Inhambane Province. A total of 30 sightings have been recorded in this area in 2014–2015 and 2018–2023 (mean = 4 sightings per year) (Marine Megafauna Foundation unpubl. data 2023). Indo-Pacific Leopard Sharks were observed at six different sites, but there was one main site from which 65% of sightings were recorded. In 92% of sightings for which behaviour was recorded ( $n = 25$ ), animals were observed resting on sandy substrate adjacent to rocky reefs, in caves or under reef ledges, in daylight hours (08:00–14:00), which is a typical behaviour for this nocturnal forager (Dudgeon et al. 2008). Photo-identification has identified 11 individuals at six different rocky reefs in the area. Indo-Pacific Leopard Sharks show site fidelity to particular sites, returning to the same reefs year after year (Pottie et al. 2021).

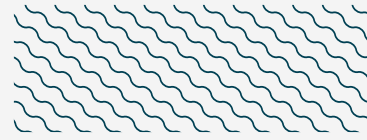
There is some evidence that this area may also be important for the reproduction of Reef Manta Rays. Dive surveys conducted between 2013–2023 have recorded 900 sightings of 402 individuals from this area. Of the 184 females identified in this area, 33 (18%) have been observed pregnant and 82 (45%) had visible reproductive scars. Pregnancies were observed March–September each year between 2017–2023, with a mean of six sightings of pregnant females per year (including multiple sightings of the same individual; range = 1–16). Some individuals were observed pregnant in multiple years. Courtship behaviours have also been observed in this area every year since 2017 (Marine Megafauna Foundation unpubl. data 2023).

In 2021 and 2022, two Reef Manta Rays were tracked with towed SPOT satellite tags. Both moved north from Bazaruto to waters east of the Save River delta (Marine Megafauna Foundation unpubl. data 2023). These tags transmit whenever the tag breaks the surface (and received when a satellite is overhead), indicating important surface behaviour, presumed to be feeding in this area.

In addition to cleaning at rocky reefs (see D1), aggregations of 25–30 Pink Whiprays have been observed on shallow sand flats, and aggregations of up to 15 are regularly observed in a shallow, sandy estuary mouth (Marine Megafauna Foundation unpubl. data 2023). In June 2022, 150–200 individuals were landed in purse seine nets in Inhassoro in a single catch. Pink Whiprays were also observed associating with Smalleye Stingrays (following or piggybacking), with up to four individuals associating with a single Smalleye Stingray in this area. This behaviour appears to be a specialised strategy to potentially reduce predation, save energy, or gain foraging benefits (Meekan et al. 2016).

In addition to the cleaning behaviour of Shorthorned Pygmy Devil Rays (see D1), groups of up to 22 individuals were observed on dive surveys (mean group size = 7.2 individuals), and solitary individuals were recorded on 15 occasions (Marine Megafauna Foundation unpubl. data 2023). Nine aerial surveys conducted in 2012-2014 recorded an additional 37 sightings, seen travelling and feeding in groups of up to 20 individuals (J Conradie unpubl. data 2023). These rays are also caught in gill and seine nets throughout the region.

In addition to sightings at reef cleaning stations (see D1) Smalleye Stingrays have also been sighted occasionally swimming in shallow sandy habitats on the leeward side of the Bazaruto Archipelago (Marine Megafauna Foundation unpubl. data 2023; E Trotzuk pers. comm. 2023). Photo-identification has recorded 120 individuals to date throughout the province and, of these individuals, 18 have been identified in the area, including one pregnant female. Two individuals identified in this area have also been identified in the waters off Praia do Tofo (~200 km south), both making return journeys (Tofo-Bazaruto-Tofo) showing connectivity to other nearby hotspots. One female sighted in Tofo in January 2017, was resighted in this area in May 2017 (visibly pregnant), and then sighted again in July 2018 in Praia do Tofo (not visibly pregnant), suggesting that individuals may give birth in surrounding waters (Marine Megafauna Foundation unpubl. data 2023). More data are needed to determine whether this is also an important reproductive area for the species.



## REFERENCES

- Bandeira S, Muiocha D, Schleyer M. 2008.** Seagrass beds. In: Everett BI, van der Elst RP, Schleyer MH, eds. *A natural history of the Bazaruto Archipelago, Mozambique*. Durban: Oceanographic Research Institute Special Publication no. 8, 65–69.
- Bessudo S, Soler GA, Klimley AP, Ketchum JT, Hearn A, Arauz R. 2011.** Residency of the scalloped hammerhead shark (*Sphyrna lewini*) at Malpelo Island and evidence of migration to other islands in the Eastern Tropical Pacific. *Environmental Biology of Fishes* 91: 165–176. <https://doi.org/10.1007/s10641-011-9769-3>
- Boggio-Pasqua A, Flam AL, Marshall AD. 2019.** Spotting the “small eyes”: using photo-ID methodology to study a wild population of small eye stingrays (*Megatrygon microps*) in southern Mozambique. *PeerJ* 7: e7110. <https://doi.org/10.7717/peerj.7110>
- Convention on Biological Diversity (CBD). 2023a.** Mozambique Channel. Available at: <https://chm.cbd.int/database/record?documentID=204004> Accessed August 2023.
- Convention on Biological Diversity (CBD). 2023b.** Save River to San Sebastian. Available at: <https://chm.cbd.int/database/record?documentID=203993> Accessed August 2023.
- Dudgeon CL, Noad MJ, Lanyon JM. 2008.** Abundance and demography of a seasonal aggregation of zebra sharks *Stegostoma fasciatum*. *Marine Ecology Progress Series* 368: 269–281. <https://www.doi.org/10.3354/meps07581>
- Gallagher AJ, Klimley AP. 2018.** The biology and conservation status of the large hammerhead shark complex: the great, scalloped, and smooth hammerheads. *Reviews in Fish Biology and Fisheries* 28: 777–794. <https://www.doi.org/10.1007/s11160-018-9530-5>
- IUCN. 2023.** IUCN Red List of Threatened Species. Version 2022-2. Available at: <https://www.iucnredlist.org/> Accessed September 2023.
- Key Biodiversity Areas (KBA). 2023.** Greater Bazaruto KBA. Available at: <https://www.keybiodiversityareas.org/site/factsheet/6688> Accessed August 2023.
- Marshall AD, Bennett MB. 2010.** Reproductive ecology of the reef manta ray *Manta alfredi* in southern Mozambique. *Journal of Fish Biology* 77: 169–190. <https://doi.org/10.1111/j.1095-8649.2010.02669.x>
- Meekan MG, Trevitt L, Simpfendorfer CA, White W. 2016.** The piggybacking stingray. *Coral Reefs* 35: 1011–1011. <https://doi.org/10.1007/s00338-016-1429-9>
- Murie CJ, Marshall AD. 2016.** *Mobula kuhlii* cleaning station identified at an inshore reef in southern Mozambique. *PeerJ PrePrints* 4: e1724v. <https://doi.org/10.7287/peerj.preprints.1724v1>
- Perryman RJ, Venables SK, Tapilatu RF, Marshall AD, Brown C, Franks D. 2019.** Social preferences and network structure in a population of reef manta rays. *Behavioral Ecology and Sociobiology* 73: 114. <https://www.doi.org/10.1007/s00265-019-2720-x>
- Pottie S, Flam AL, Keeping JA, Chivindze, Bull JC. 2021.** Quantifying the distribution and site fidelity of a rare, non-commercial elasmobranch using local ecological knowledge. *Ocean & Coastal Management* 212: 105796. <https://doi.org/10.1016/j.ocecoaman.2021.105796>
- Roberts MJ, Ternon J-F, Morris T. 2014.** Interaction of dipole eddies with the western continental slope of the Mozambique Channel. *Deep-Sea Research Part II - Topical Studies in Oceanography* 100: 54–67. <https://doi.org/10.1016/j.dsr2.2013.10.016>
- Rohner CA. 2013.** A global whale shark hotspot in southern Mozambique: population structure, feeding ecology, movements and environmental drivers. Unpublished PhD Thesis, The University of Queensland, St Lucia.
- Venables SK, van Duinkerken DI, Rohner CA, Marshall AD. 2020.** Habitat use and movement patterns of reef manta rays *Mobula alfredi* in southern Mozambique. *Marine Ecology Progress Series* 634: 99–114. <https://doi.org/10.3354/meps13178>
- Venables SK, Conradie, J, Marshall AD. 2022.** First records of the ornate eagle ray *Aetomylaeus vespertilio* from the Inhambane Province, Mozambique. *Journal of the Marine Biological Association of the United Kingdom* 101: 1085–1088. <https://doi.org/10.1017/S0025315422000054>

Vinayachandran PNM, Masumoto Y, Roberts MJ, Huggett JA, Halo I, Chatterjee A, Amol P, Gupta GVM, Singh A, Mukherjee A, et al. 2021. Reviews and syntheses: Physical and biogeochemical processes associated with upwelling in the Indian Ocean. *Biogeosciences* 18: 59676029. <https://doi.org/10.5194/bg-18-5967-2021>