

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

SEYCHELLES INNER ISLANDS ISRA

Western Indian Ocean Region

SUMMARY

Seychelles Inner Islands is an archipelago of 39 islands located on the Mahé plateau in Seychelles. Diverse habitats include extensive seagrass beds and coral reefs, mudflats, mangroves, reef flats, and combinations of sandy substrates, coral pebbles, and granitic reefs. This area overlaps with 13 Marine Protected Areas, 12 Key Biodiversity Areas, and an Ecologically or Biologically Significant Marine Area. Within this area there are: **threatened species** (e.g., Grey Reef Shark *Carcharhinus amblyrhynchos*) and **reproductive areas** (e.g., Scalloped Hammerhead *Sphyrna lewini*).

CRITERIA

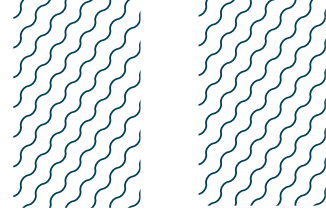
Criterion A - Vulnerability; Sub-criterion C1 - Reproductive Areas

SEYCHELLES

0-50 metres

5,523.4 km²





DESCRIPTION OF HABITAT

Seychelles Inner Islands is located on the Mahé Plateau, a steep-sided plateau in the Seychelles, that rises rapidly from the deep ocean. Seychelles Inner Islands is made up predominantly of subsurface granite and coral outcrops forming banks (SFA 2019). It is composed of an archipelago of more than 39 islands, which are in effect the exposed mountain tops of the plateau. Seychelles Inner Islands supports extensive seagrass beds and coral reefs, mudflats, mangroves, reef flats, and various combinations of sandy substrates, coral pebbles, and granite reefs.

Seychelles Inner Islands forms an area of shallow water (maximum 50 m depth) over 1,600 km from any continental landmass. The oceanography of the area is influenced by the monsoon seasons (Novozhilov et al. 1992). From May to September (the austral winter), the winds blow from the southeast and from December to March (austral summer), they blow from the northwest. Rainfall is highest during the summer period. The transitional period in April and October/November usually features very calm seas and low winds (Novozhilov et al. 1992). Sea conditions, including sea surface temperature, are subject to positive Indian Ocean Dipole and El-Nino events (Burns & Subrahmanyam 2016).

This area overlaps with 13 Marine Protected Areas, 12 Key Biodiversity Areas (KBA 2023), and the Mahé, Alphonse and Amirantes Plateau Ecologically or Biologically Significant Marine Area (CBD 2023).

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

Eight Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species™ regularly occur in the area. Threatened sharks comprise two Critically Endangered species, two Endangered species, and three Vulnerable species; threatened rays comprise one Endangered species (IUCN 2023).

SUB-CRITERION C1 – REPRODUCTIVE AREAS

Seychelles Inner Islands is an important reproductive area for eight shark and one ray species.

Surveys of shark landings from artisanal fisheries started in May 2012 and ray catch monitoring in 2017 (J Nevill unpubl. data 2023). Data recorded during the study period were collected exclusively on the principal island of Mahé where 90% of the artisanal catch of Seychelles Inner Islands is landed. As such, it is considered representative of the artisanal shark catch of the area. The isolation of the area means that neonates and juveniles of coastal and shallow water species are not migrating into the area and that their presence means breeding occurs even if pregnant females are scarce in landings. Assessment of pregnancy in females was undertaken opportunistically where possible and was recorded by number and total length (TL; for sharks) or disc width (DW; for rays) of pups. Neonate sharks were identified based on having an open and fresh umbilical scar. Much of the landed catch is already dressed and as such, the number of pregnant females recorded is unlikely to be representative of the proportion of mature females pregnant in the population.

Grey Reef Shark is the second most landed species and constitutes the largest species tonnage landed with 6,601 specimens recorded: 2,525 intact (size range, 59–180 cm TL) and 4,076 dressed carcasses. They are caught from Seychelles Inner Island's reef areas and are occasionally targeted at known aggregation sites. Breeding occurs from April to October (as assessed by the size of developing embryos and the occurrence of neonates in landings) with clear peaks at the beginning and end of this period. 146 pregnant females (5.78%; litter size, 1–6 pups) and 109 neonates (4.32%; size range, 59–74 cm TL) were recorded from mid-2012 to February 2020. The remaining specimens therefore constitute individuals of other life-stages (from juveniles to large adults). The known size-at-birth for this species is 48–49 cm TL and size-at-maturity is 110–145 cm TL for males and 120–142 cm TL for females (Wetherbee et al. 1997; Ebert et al. 2021).

A total of 347 Bull Sharks (187 intact; size range, 69–314 cm TL, from neonates to very large adults and 160 dressed) were recorded from Seychelles Inner Islands. This species is seasonally abundant around central granitic islands and prefers brackish water areas to give birth. The known size-at-birth for this species is 56–81 cm TL, and size-at-maturity is 157–226 cm TL for males and 180–230 cm TL for females (Ebert et al. 2021). Bull Sharks are resident year-round on the Mahé Plateau and pup from November to December in well-defined areas (J Nevill unpubl. data 2023). Pups are resident inshore (in sheltered lagoons from the northwest monsoon and up into the rivers). Sixteen pregnant females were examined (litter size, 4–16 pups). Aside from the females resident on the plateau, it is known that some females come from the Amirantes Bank to pup on the Mahé Plateau (SOSF unpubl. data 2023). Twenty neonates (size range, 69–81 cm TL) were recorded in the catch during the survey (representing 5.8% of total catches).

Blacktip Shark is the third most landed species and constitutes individuals of all lifecycle stages from neonates to large adults. Overall, 5,209 specimens (1,806 intact and 3,403 dressed) were reported captured from Seychelles Inner Islands (size range, 62–237 cm TL). The size-at-birth for this species is 56–81 cm TL and size-at-maturity is 125–201 cm TL for males and 147–205 cm TL for females (Dudley & Cliff 1993; Castro 1996; Capapé et al. 2004; White 2007; Harry et al. 2019). Of the intact specimens, 593 (32.8%) were neonates reflecting the nearshore nature of the reproductive area. This species pups annually in March/April utilising coastal nursery areas. Twelve pregnant females were also examined (litter size, 1–6 pups).

Spottail Shark is the fourth most caught species in the area. Neonates through to fully mature adults were documented (size range, 55–149 cm TL) from across coastal areas with 1,709 intact and 2,504 dressed specimens recorded during the survey period. The known size-at-birth for this species is 44–72 cm TL and size-at-maturity is 90–109 cm TL for males and 95–118 cm TL for females (Ebert et al. 2021). Twelve pregnant females were examined (litter size, 1–5 pups). Neonates are caught in large numbers (17% of the intact specimens recorded were neonates) due to the coastal nature of reproductive areas.

Snaggletooth Shark were recorded from Seychelles Inner Islands and consisted of 43 specimens from neonates through to fully mature adults (24 intact with size range 74–214 cm TL, and 19 dressed). The size-at-maturity for males and females is approximately 110–120 cm TL (White & Simpfendorfer 2016). Four neonates (9.3%) were recorded during the months of July and August (size range, 74–81 cm TL). One pregnant female was recorded with 12 pups.

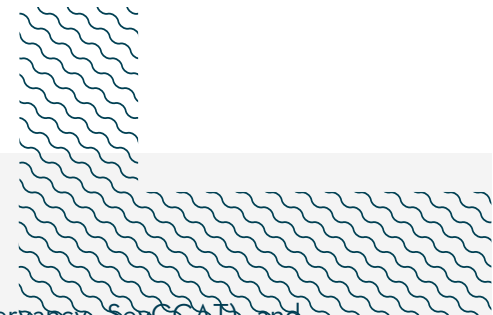
Scalloped Hammerheads are the most landed shark species with 9,041 specimens recorded from Seychelles Inner Islands (3,741 intact, size range 46–307 cm TL, and 5,300 dressed). These constitute individuals of all lifecycle stages from neonates to large adults captured in coastal areas. The known size-at-birth for this species is 31–57 cm TL and size-at-maturity is 140–198 cm TL for males and 200–250 cm TL for females (Ebert et al. 2021). Of the intact specimens, 864 (23%) were neonates. Pupping occurs June–August and 34 pregnant females (0.38%) have been recorded in landings during these

months.

Great Hammerheads were recorded from Seychelles Inner Islands with 705 specimens recorded, from neonates through to fully mature adults (197 intact, size range 64–495 cm TL, and 508 dressed). The size-at-birth for this species is 30–50 cm TL and the size-at-maturity is 225–269 cm TL for males and 210–300 for females (Ebert et al. 2021). Of the intact specimens, 10 (5%) were neonates. Popping takes place in December and January.

A total of 120 Whitetip Reef Sharks of all life stages were recorded from Seychelles Inner Islands, from neonates through to fully mature adults (72 intact, size range 56–140 cm TL, and 48 dressed). This species is resident in Seychelles Inner Island’s reef areas, year-round, and completes its full lifecycle in this area. The size-at-birth for this species is 52–60 cm TL and size-at-maturity of both males and females is ~ 105 cm TL (Ebert et al. 2021). Of the 72 intact specimens recorded, seven (9.7%) were neonates, these were recorded from November to February. Two pregnant females were examined (litter size, 2–3 pups).

A total of 757 Spotted Eagle Rays were recorded from Seychelles Inner Islands (size range, 38–176 cm DW). The size-at-birth for this species is 33–36 cm DW and the size-at-maturity is 100–130 cm DW for males and > 150 cm DW for females. This species is resident all year round in the area. One pregnant female was examined in August 2022, with two pups (55 and 59 cm DW). Using that measurement threshold (i.e., 60 cm DW or less), a minimum of 41% of specimens caught classify as YOY.



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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													
<i>Carcharhinus amblyrhynchos</i>	Grey Reef Shark	EN	0-280	X		X							
<i>Carcharhinus leucas</i>	Bull Shark	VU	0-256	X		X							
<i>Carcharhinus limbatus</i>	Blacktip Shark	VU	0-140	X		X							
<i>Carcharhinus sorrah</i>	Spottail Shark	NT	0-140			X							
<i>Hemipristis elongata</i>	Snaggletooth Shark	EN	0-130	X		X							
<i>Sphyrna lewini</i>	Scalloped Hammerhead	CR	0-1,043	X		X							
<i>Sphyrna mokarran</i>	Great Hammerhead	CR	0-300	X		X							
<i>Triaenodon obesus</i>	Whitetip Reef Shark	VU	0-330	X		X							
RAYS													
<i>Aetobatus ocellatus</i>	Spotted Eagle Ray	EN	0-40	X		X							

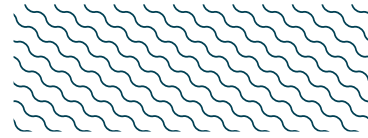
SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
<i>Carcharhinus amboinensis</i>	Pigeye Shark	VU
<i>Carcharhinus melanopterus</i>	Blacktip Reef Shark	VU
<i>Carcharhinus obscurus</i>	Dusky Shark	EN
<i>Carcharhinus plumbeus</i>	Sandbar Shark	EN
<i>Galeocerdo cuvier</i>	Tiger Shark	NT
<i>Loxodon macrorhinus</i>	Sliteye Shark	NT
<i>Nebrius ferrugineus</i>	Tawny Nurse Shark	VU
<i>Negaprion acutidens</i>	Sharptooth Lemon Shark	EN
<i>Sphyrna zygaena</i>	Smooth Hammerhead	VU
RAYS		
<i>Aetomylaeus vespertilio</i>	Ornate Eagle Ray	CR
<i>Mobula alfredi</i>	Reef Manta Ray	VU
<i>Mobula mobular</i>	Spinetail Devil Ray	EN
<i>Pateobatis fai</i>	Pink Whipray	VU
<i>Rhina ancylostomus</i>	Bowmouth Guitarfish	CR
<i>Rhinoptera jayakari</i>	Oman Cownose Ray	EN
<i>Rhynchobatus australiae</i>	Bottlenose 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 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 Seychelles Inner Islands is an important reproductive area for five shark and one ray species. Landings monitoring has focused on the north of Mahé where the three main ports (Victoria, Bel Ombre, and Providence) and the main commercial centre and principal fish (Victoria) market are situated. Work has also been undertaken in close collaboration with several of the artisanal shark fishery boats (specifically 4 of the 6 boats on Mahé known to be active in the targeted artisanal shark fishery, including the 3 most prolific operators) to optimise coverage of the shark catch.

Blacktip Reef Sharks were recorded landed on 11 days during the survey period. Eight intact and six dressed individuals. They are known to persist in certain isolated areas on the Mahé Plateau (e.g., Denis and Bird islands). Mature males and females have been recorded in the catch and personal observations of small juveniles in shallow water at Denis Island have been made and have been reported also from Bird Island.

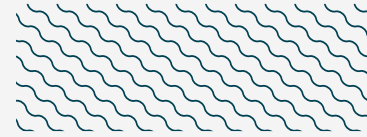
Tiger Sharks were recorded on 78 days during the survey period. A total of 102 specimens were recorded during the study period (43 intact, size range 105–411 cm TL, and 59 dressed). Two pregnant females were examined with 34 and 14 pups, respectively.

A total of 61 Sliteye Sharks were recorded (53 intact, size range 74–86 cm TL, and eight dressed). A single pregnant female was recorded with two pups. Neonates are too small to be caught by the fishery. Out of 53 intact specimens, only four were females.

Sharptooth Lemon Shark were recorded on 59 days constituting 69 specimens (26 intact, size range 70–276 cm TL, and 43 dressed). This included three pregnant females (litter size, 9–13) and only one neonate. There are reports of nursery areas in the mangroves of Curieuse Island and Port Launay. Young juvenile individuals are seen year-round all around the central islands of the archipelago.

Tawny Nurse Sharks are common in the area but are generally released by fishers. Gravid females were recorded. They seasonally aggregate on the west coast of Praslin on the outside edge of the lagoon.

Baited Remote Under Video data shows that Bowmouth Guitarfish are resident all-year round on the Mahé Plateau (S Laing pers. comm. 2023). Five specimens were recorded in the artisanal catch during the survey period, which were all adult (size range, 213–226 cm TL) and comprised one male and four females (two of which were pregnant with 7 and 8 pups, respectively). They are known to be resident throughout the islands but are generally scarce.



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