

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

# ALCATRAZES ARCHIPELAGO ISRA

#### South American Atlantic Region

### SUMMARY

Alcatrazes Archipelago is located along the coast São Paulo state, in southeastern Brazil. The habitat is characterised by rocky reefs covered by macroalgae, filamentous algae, encrusting coralline algae, sponges, and corals. The area is influenced by seasonal upwellings of cold subtropical waters during the austral summer. The area overlaps with the Wildilife Refuge of Alcatrazes and the Tupinambás Ecological Station. Within this area there are: **threatened species** (e.g., Spotback Skate *Atlantoraja castelnaui*); **range-restricted species** (e.g., Shortnose Guitarfish *Zapteryx brevirostris*); **reproductive areas** (e.g., Eyespot Skate *Atlantoraja cyclophora*); and **undefined aggregations** (Silky Shark *Carcharhinus falciformis*).

### CRITERIA

Criterion A – Vulnerability; Criterion B – Range Restricted; Sub-criterion C1 – Reproductive Areas; Sub-criterion C5 – Undefined Aggregations

-	-
BRAZIL	
-	-
0-46 metre	es
-	-
205.3 km²	
-	-



# DESCRIPTION OF HABITAT

Alcatrazes Archipelago is located along the São Paulo state coast, about 33 km off the mainland, in southeastern Brazil. The habitat is characterised by rocky reefs covered by macroalgae, filamentous alga (turfs), encrusting coralline algae, sponges, and corals (e.g., *Mussismilia hispida* and Ten-ray Star Coral *Madracis decactis*) (Aued et al. 2018; Motta et al. 2021). The area is influenced by seasonal upwellings of cold subtropical waters during the austral summer, associated with alongshore winds, and cyclonic vortices that come from the Brazilian Current (Castro-Filho & Miranda 1998; Borzone et al. 1999). The predominance of north and northeast winds during this period promotes the intrusion of South Atlantic Central Water (Castro-Filho et al. 1987) over the middle and inner shelves, lowering water temperatures, enhancing primary production in the euphotic zone, and enriching the seafloor with the input of particulate organic matter. Spatially, its influence is not uniform across the area, with water characteristics varying according to the archipelago's exposure to winds and waves (Karlovic et al. 2021; Takase et al. 2021).

This Important Shark and Ray Area is benthic and pelagic and is delineated from surface waters (O m) to 46 m based on the bathymetry of the area.

### **ISRA CRITERIA**

#### **CRITERION A - VULNERABILITY**

Four 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 Spotback Skate (Pollom et al. 2020b); the Endangered Eyespot Skate (Pollom et al. 2020c) and Shortnose Guitarfish (Pollom et al. 2020a); and the Vulnerable Silky Shark (Rigby et al. 2021).

# **CRITERION B - RANGE RESTRICTED**

This area holds the regular presence of the Spotback Skate and Shortnose Guitarfish as resident range-restricted species. Scientific surveys (n = 50), using otter trawl nets between 28–53 m depth, were conducted in 2011 (n = 15), 2014 (n = 5), 2015 (n = 6), 2018 (n = 12), and 2019 (n = 12) around the Alcatrazes Archipelago (Karlovic et al. 2021). Historical surveys using the same methodology were conducted in 13 cruises from 1985, 1984, 1987, 1994, 1997, 2005, and 2006. These encompassed a broader depth range (8–124 m depth) and were used to compare the abundance of species in the Alcatrazes Archipelago with adjacent waters.

A total of 38 Spotback Skate (17-106 cm total length [TL]) were captured in 2011 (n = 11), 2014 (n = 7), 2015 (n = 1), 2018 (n = 16), and 2019 (n = 3), and the mean density was 220 individuals/km<sup>2</sup>, while historical records outside this area in the same state, the mean density was 188 individuals/km<sup>2</sup> using the same method of capture (TCA Karlovic unpubl. data 2023).

A total of 257 Shortnose Guitarfish (17–59.8 cm TL) were captured in 2011 (n = 53), 2014 (n = 44), 2015 (n = 39), 2018 (n = 87), and 2019 (n = 34), and the mean density was 970 individuals/km<sup>2</sup>, while historical records outside this area in the same state, the mean density was 488 individuals/km<sup>2</sup> (TCA Karlovic unpubl. data 2023).

The Spotback Skate and the Shortnose Guitarfish occur in the Patagonian Shelf and the South Brazil Shelf Large Marine Ecosystems.

### SUB-CRITERION C1 - REPRODUCTIVE AREAS

Alcatrazes Archipelago is an important reproductive area for two ray species.

Scientific surveys (n = 50) were conducted in 2011 (n = 15), 2014 (n = 5), 2015 (n = 6), 2018 (n = 12), and 2019 (n = 12) around the Alcatrazes Archipelago using otter trawl nets between 28-53 m depth (Karlovic et al. 2021). Of 38 Spotback Skates captured (17-106 cm TL, mean =  $59.2 \pm 28.5$  SD cm TL), six (16%) were <30 cm TL. Spotback Skate young hatch at 17 cm TL (Last et al. 2016), indicating those were neonates or young-of-the-year (YOY). Similarly, from 56 Eyespot Skates captured (8.5-58 cm TL, mean =  $33.7 \pm 15.7$  SD cm TL), 19 (34%) were <20 cm TL. Eyespot Skate young hatch at 10 cm TL (Last et al. 2016), indicating those were neonates or YOY. Within this area, 75% of catches for both species corresponded to juveniles and mature individuals were only captured seasonally. Spotback Skate mature males were only captured in spring 2011 (n = 1). Eyespot Skate mature males were only captured in spring 2011 (n = 1), summer 2018 (n = 3), and mature females only in summer 2014 (n = 3), spring 2015 (n = 1), and summer 2018 (n = 3). Combined, these findings support the importance of this area for the early life stages of Spotback Skate and Eyespot Skate.

# SUB-CRITERION C5 - UNDEFINED AGGREGATIONS

Alcatrazes Archipelago is an important area for undefined aggregations of one shark species.

In May 2021, 150 kg of Silky Sharks were seized from the illegal fishing of one artisanal fishing boat within the area. From images shared on social media, it was possible to count at least 35 individuals, of which ~20 were considered neonates (estimated <90 cm TL). Size-at-birth for this species is 56-87 cm TL (Ebert et al. 2021). Benthic and pelagic Baited Remote Underwater Video Station (BRUVS) surveys were undertaken in January 2022, July 2022, February 2023, and June 2023. In each survey, 26 benthic and 12 pelagic stereo-BRUVS were deployed, except in June 2023 when 23 benthic and 13 pelagic stereo-BRUVS were deployed (Motta et al. 2024). Of the 150 deployments, 16 (10.7%) BRUVS recorded sharks in waters from 10-46 m deep (mean = 25.6 m ± 13.8 m SD). Silky Sharks were the most abundant species, representing 48.9% of all observed sharks. This species was recorded in 56.3% of all BRUVS with shark records (Motta et al. 2024). The MaxN (defined as the maximum number of individuals of the same species recorded in a single frame) of the species ranged from 1-10 sharks (average = 2.4). Of the 22 Silky Sharks recorded in nine deployments, all in June 2023 and measuring between 80-162.5 cm TL, 20 were considered neonates or YOY (<113 cm TL). Aggregations of Silky Sharks were also opportunistically reported in the area on two different occasions in June 2024 (Corrêa et al. 2024). Videos of the second event were taken by free divers showing an aggregation of between 250-300 individuals (80-200 cm TL), with smaller animals being more numerous (Corrêa et al. 2024). This aggregation was present on consecutive days, although in smaller numbers (50 individuals; Corrêa et al. 2024). Those records support the regular aggregations of early stages of Silky Sharks during the winter (LD Chelotti pers. obs. 2024).



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# QUALIFYING SPECIES

Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				Α	В	Cı	C2	C3	C4	C5	Dı	D2
SHARKS				L					L			
Carcharhinus falciformis	Silky Shark	VU	O-1,112	Х						Х		
RAYS												
Atlantoraja castelnaui	Spotback Skate	CR	0-300	Х	Х	Х						
Atlantoraja cyclophora	Eyespot Skate	EN	0-320	Х		Х						
Zapteryx brevirostris	Shortnose Guitarfish	EN	0-140	Х	Х							

# SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category				
SHARKS						
Carcharhinus brevipinna	Spinner Shark	VU				
Carcharias taurus	Sandtiger Shark	CR				
Sphyrna lewini	Scalloped Hammerhead	CR				
Sphyrna zygaena	Smooth Hammerhead	VU				
Squatina guggenheim	Angular Angelshark	EN				
Squatina occulta	Hidden Angelshark	CR				
RAYS						
Aetobatus narinari	Whitespotted Eagle Ray	EN				
Dasyatis hypostigma	Groovebelly Stingray	EN				
Gymnura altavela	Spiny Butterfly Ray	EN				
Psammobatis extenta	Zipper Sandskate	LC				
Pseudobatos horkelii	Brazilian Guitarfish	CR				
Rioraja agassizi	Rio Skate	VU				

IUCN Red List of Threatened Species Categories are available by searching species names at <u>www.iucnredlist.org</u> 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 Alcatrazes Archipelago is an important area for undefined aggregations of two shark species.

In June 2022, one aggregation of Scalloped Hammerheads was recorded in one BRUVS deployment (MaxN = 7, 105.5–128.7 cm TL; Motta et al. 2024). In December 2022, three individuals (~150 cm TL) were opportunistically observed by divers in the area (Meira et al. 2024). Size at maturity ranges from 140–198 cm TL for males to ~200–250 cm TL for females (Ebert et al. 2021). In March 2024, an aggregation of ~40 Scalloped Hammerheads was opportunistically observed and recorded in the area by divers (Meira et al. 2024). Aggregations of juvenile Scalloped Hammerhead in the area might be related to the migration of neonates and YOY from their summer nurseries in coastal areas (Motta et al. 2005) to deeper waters as they grow (Vooren et al. 2005). The Smooth Hammerhead was recorded in 43.8% of all BRUVS with shark records in the area (Motta et al. 2024). The MaxN of the species ranged from 1–4 sharks (average = 1.5; 123.5–162.5 cm TL). Further information is required to understand the regularity and function of those aggregations, and the importance of the area for sharks.

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