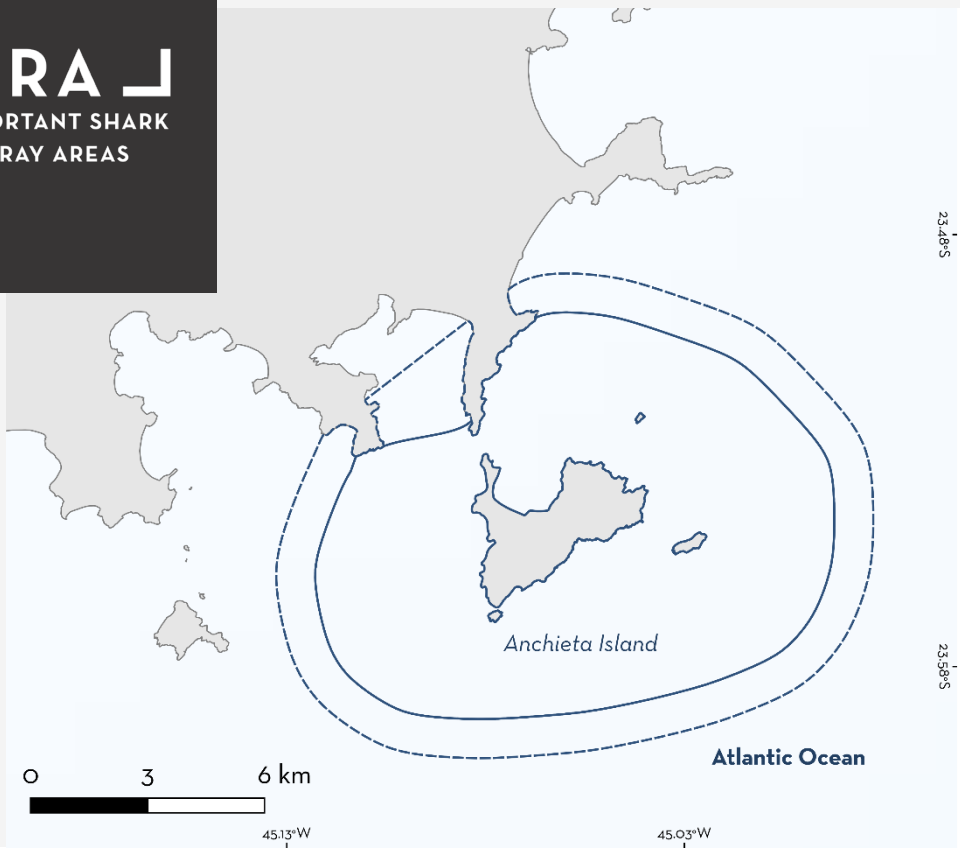
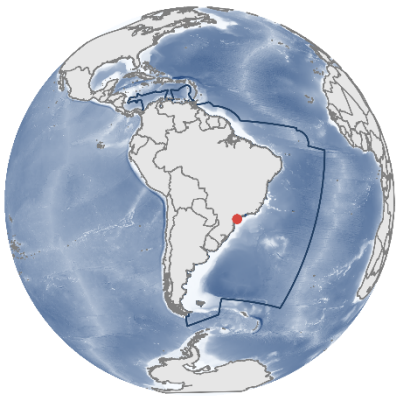
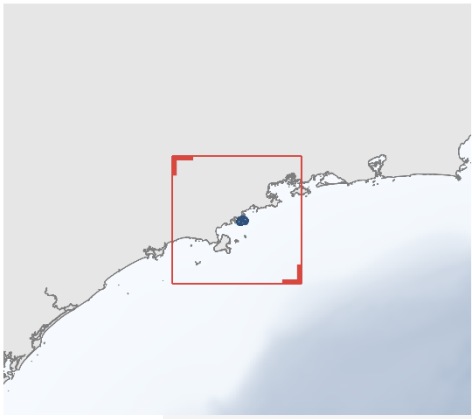
ISRA
IMPORTANT SHARK AND RAY AREAS







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

ANCHIETA ISLAND ISRA

South American Atlantic Region

BRAZIL

0–40 metres

95.38 km²

SUMMARY

Anchieta Island is located in the northern part of the São Paulo state in southeastern Brazil. The area encompasses Anchieta Island and surrounding islands including Palmas and Cabras Islands. It is characterised by muddy substrate and patches of algae. The area is influenced by a cold, nutrient-rich water mass. It overlaps with the Tupinambás Ecological Station - Conflict Zone Marine Protected Area. Within this area there are: **threatened species** (e.g., Rio Skate *Rioraja agassizi*); **range-restricted species** (e.g., Brazilian Guitarfish *Pseudobatos horkelii*); and **reproductive areas** (e.g., Shortnose Guitarfish *Zapteryx brevirostris*).

CRITERIA

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

DESCRIPTION OF HABITAT

Anchieta Island is located in Ubatuba, in the northern part of the São Paulo state in southeastern Brazil. The area encompasses Anchieta Island and some surrounding islands, including Palmas and Cabras Islands. It is characterised by heterogeneous sediment with high deposition of sand and higher concentration of organic matter related to algae banks on the continental side of the area (Candido 2023). The area has relatively stable conditions and is less influenced than other surrounding areas by south and southeast waves (Barcellos & Furtado 1999). The direction and intensity of the winds influence the area through the seasonal (austral spring and summer months) influx of the South Atlantic Central Water (Pires-Vanin & Matsuura 1993; Muto et al. 2000; Sumida et al. 2005).

This area encompasses the Apa Marinha Do Litoral Norte marine protected area (MPATLAS 2025).

This Important Shark and Ray Area is benthic and pelagic and is delineated from inshore and surface waters (0 m) to 40 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A – VULNERABILITY

Three 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 Brazilian Guitarfish (Pollom et al. 2020b), the Endangered Shortnose Guitarfish (Pollom et al. 2020a), and the Vulnerable Rio Skate (Pollom et al. 2020c).

Rio Skate is also considered Endangered according to the Red Book of Marine Fishes of Brazil (ICMBio 2018).

CRITERION B – RANGE RESTRICTED

Anchieta Island holds the regular presence of Brazilian Guitarfish and Rio Skate as resident range-restricted species. These species have been regularly reported from otter trawl surveys undertaken between 2022–2024 and citizen science reports (TC Karlovic & JF Dias unpubl. data 2024). Surveys were undertaken across the broader adjacent area of Ubatuba, however, these range-restricted species were only observed in this area.

For Brazilian Guitarfish, 71 individuals were reported from otter trawl surveys (TC Karlovic & JF Dias unpubl. data 2024). Aggregations of >100 individuals were also reported in the area in 2024 and 2025 via citizen science. Between 2022–2024, 64 otter trawl surveys reported 84 Rio Skate; many of which were considered neonate/young-of-the-year (YOY) based on their sizes (TC Karlovic & JF Dias unpubl. data 2024). There are also historical reports of these species in this area since 1985, which confirm the longstanding importance of the area for these range-restricted species (Ponz-Louro 1995; Rocha & Rossi-Wongtschowski 1998; Muto et al. 2000; Oddone & Amorim 2007; Oddone et al. 2007; Oddone et al 2008; Souza et al. 2018; Rodrigues et al. 2021). Brazilian Guitarfish occur in the South Brazilian Shelf Large Marine Ecosystem (LME) and the Patagonian Shelf LME. Rio Skate occur primarily in the South Brazilian Shelf LME and Patagonian Shelf LME, and only marginally in the East Brazil Shelf LME.

SUB-CRITERION C1 – REPRODUCTIVE AREAS

Anchieta Island is an important reproductive area for two ray species.

Brazilian Guitarfish (n = 71) were recorded from 64 otter trawl surveys undertaken between 2022–2024 (TC Karlovic & JF Dias unpubl. data 2024). Surveys were undertaken in May 2022 (n = 16), November 2022 (n = 16), January 2023 (n = 16), and February 2024 (n = 16). Of the animals captured, 44 were neonates/YOY measuring 24–42 cm total length (TL) (TC Karlovic & JF Dias unpubl. data 2024). The size-at-birth of this species is 22–29 cm TL (Gomes et al. 2010), and the size at one year of age is 45 cm TL (Caltabellotta et al. 2019). Neonates/YOY were caught in 2022 (n = 18; 30–42 cm TL), 2023 (n = 10; 24–29 cm TL), and 2024 (n = 16; 23–28 cm TL). In addition, Brazilian Guitarfish aggregate in groups of >100 individuals in this area for reproductive purposes – specifically at Palmas Beach on Anchieta Island. Aggregations have been reported by Anchieta Island State Park's staff, recreational divers, and scientific researchers (LC Candido pers. obs. 2025; TC Karlovic, JF Dias, LC Candido & PS Moreira unpubl. data 2024). Brazilian Guitarfish are known to migrate from deeper areas (>100 m) to coastal zones during the summer months to mate and give birth (Lessa et al. 1986; Anderson et al. 2021). Therefore, Brazilian Guitarfish appear to be aggregating in this area for reproductive purposes. This is consistent with the observations in this area where in 2024, aggregations increased in size from four individuals in October to >100 individuals in November (PS Moreira pers. obs. 2025). Divers from the Diving into Conservation Project also video-recorded aggregations in January 2025. In the same month, drone surveys at Palmas Beach also recorded aggregations of >100 individuals (adults measuring >74 cm TL) (TC Karlovic & LC Candido unpubl. data 2025c).

For Shortnose Guitarfish, at least 25 animals were recorded during otter trawl surveys undertaken between 2022–2024 (TC Karlovic & JF Dias unpubl. data 2024). Of these, 24 neonates/YOY were recorded in 2022 (n = 11, 13–55 cm TL), 2023 (n = 10, 16–46 cm TL), and 2024 (n = 3, 20–34 cm TL). The size-at-birth of this species is 13–14 cm TL (Carmo et al. 2018; Maganhe et al. 2023), and the size at one year of age is ~25 cm TL (Caltabellotta et al. 2019). Shortnose Guitarfish occur primarily in the South Brazilian Shelf LME and Patagonian Shelf LME, and only marginally in the East Brazil Shelf LME.

Historic trawl survey data collected between 1985–1986 (39 trawls undertaken up to the 30 m isobath) also reported the presence of neonate/YOY individuals of these two species in this area. The combination of these historic reports of neonate/YOY Brazilian Guitarfish (n = 19) and Shortnose Guitarfish (n = 22) in combination with the contemporary information confirm the longstanding importance of this area for early life stages of these range-restricted species (JF Dias unpubl. data 2024). This is one of the only known locations with regular and predictable observations of Shortnose Guitarfish at early life stages.

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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
RAYS												
Pseudobatos horkelii	Brazilian Guitarfish	CR	0–150	X	X	X						
Rioraja agassizi	Rio Skate	EN*	5–600	X	X							
Zapteryx brevirostris	Shortnose Guitarfish	EN	0–140	X		X						

*Considered EN nationally but VU globally.

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Rhizoprionodon lalandii	Brazilian Sharpnose Shark	VU
Squatina guggenheim	Angular Angelshark	EN
RAYS		
Aetobatus narinari	Whitespotted Eagle Ray	EN
Atlantoraja castelnaui	Spotback Skate	CR
Atlantoraja cyclophora	Eyespot Skate	EN
Atlantoraja platana	La Plata Skate	EN
Dasyatis hypostigma	Groovebelly Stingray	EN
Gymnura altavela	Spiny Butterfly Ray	EN
Gymnura micrura	Smooth Butterfly Ray	NT
Hypanus guttatus	Longnose Stingray	NT
Myliobatis freminvillei	Bullnose Eagle Ray	VU
Rhinoptera bonasus	American Cownose Ray	VU
Rhinoptera brasiliensis	Brazilian Cownose Ray	VU

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 Anchieta Island may be an important reproductive area for two ray species and a feeding area for four ray species. Further information is required to understand the function of this area for these species.

This area might be an important reproductive area for Whitespotted Eagle Ray. Reproductive behaviours, including a mating event, were recorded in the region. Reproductive behaviour was reported through diver-operated video (in March 2023) and drone surveys (in January 2024) at the Palmas Beach and the South Beach, both in this area (Karlovic et al. 2024). In February 2023, a Whitespotted Eagle Ray was recorded during sampling using diver-operated video. The animal was searching for food and grasping rock reefs at the South Beach - Anchieta Island (TC Karlovic & LC Candido unpubl. data 2024a). Later, in February and April 2024, the same behavior was recorded by citizen scientists, with Whitespotted Eagle Ray grasping rocky reefs and the concrete structure of a pier, in the vicinity of Saco da Ribeira (TC Karlovic unpubl. data 2024c, 2024d). Moreover, previous studies indicate the species has a diet composed of Gastropoda species, with *Strombus pugilis* as the most important prey by index of relative importance (IRI) and by frequency of occurrence (FO) (32.4% IRI and 29.4% FO for females and 70.5% IRI and 32.5% FO for males) (Serrano-Flores et al. 2019). The most representative prey item (i.e., *S. pugilis*) is a dominant species of the local benthic community (Vanin et al. 1997).

This area might be an important reproductive area for Groovebelly Stingray. Four neonates/YOY were recorded in 2022 (n = 2, 17–20 cm DW) and 2023 (n = 2, 17–18 cm DW). The size-at-birth of this species is 10–12 cm DW (Gomes et al. 2010). In addition, pregnant Groovebelly Stingrays were recorded during diver-operated video samplings on 2nd August 2022 and 12th January 2023 at the Palmas Beach at Anchieta Island. Pregnant females, identified by distended bellies were also recorded at South Beach on 23rd March 2023 and 11th January 2024 (TC Karlovic unpubl. data 2024, TC Karlovic & LC Candido unpubl. data 2025).

Longnose Stingrays and Grovebelly Stingrays are commonly observed in the shallow waters (<5 m) foraging over sand (TC Karlovic & LC Candido pers. obs. 2025). Areas such as these comprise bays that provide greater protection against predation, being optimum foraging locations since sand predominant environments around the island are associated with high abundances of polychaetes (Sumida et al. 2020). Overall, the Ubatuba region holds a great diversity of polychaetes (Paiva 1993), the most important group (47.9% IRI) of the Grovebelly Stingray's diet (Lemos et al. 2024).

On December 2024, a Longnose Stingray was recorded at the Palmas Beach – Anchieta Island by a citizen scientist using a drone (TC Karlovic & LC Candido unpubl. data 2024b). The animal was excavating and jetting water into the substrate, leaving plumes of sediment around its snout. This species is considered a generalist and opportunistic predator, feeding on a variety of benthic invertebrates (Gianeti et al. 2019). Despite this, some food items standout such as the shrimps, *Ogyrides alphaerostris* and *Leptochela serratorbita* (32.5% IRI and 36.9% FO; 2.26% IRI and 24.64% FO) (Gianeti et al. 2019). According to previous studies, both prey species occur in this region (Costa et al. 2000). Particularly, *L. serratorbita* is also an important prey for other sympatric species (Bornatowski et al. 2014; Lemos et al. 2024) for instance Rio Skate and Grovebelly Stingray (Muto et al. 2001).

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