



RIO DE JANEIRO SHELF ISRA

South American Atlantic Region

SUMMARY

Rio de Janeiro Shelf is located in southeast Brazil. The area is situated in the Rio de Janeiro State and extends from the mouth of Guanabara Bay to the coastal areas of Niterói and Rio de Janeiro municipalities. It includes 15 islands ~5-9 km from the shore and is characterised by extensive sandy substrates with small patches of rocky areas. This area overlaps with two protected areas. Within this area there are: **threatened species** (e.g., Spotback Skate *Atlantoraja castelnaui*); **range-restricted species** (e.g., Bignose Fanskate *Sympterygia acuta*); **reproductive areas** (e.g., Brazilian Guitarfish *Pseudobatos horkelii*); and the area sustains a **high diversity of sharks** (25 species).

CRITERIA

Criterion A - Vulnerability; Criterion B - Range Restricted; Sub-criterion C1 - Reproductive Areas; Sub-criterion D2 - Diversity



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BRAZIL	
-	-
0-50 metr	'es
-	-
549.2 km²	
-	-



DESCRIPTION OF HABITAT

Rio de Janeiro Shelf is located in the Rio de Janeiro State in southeast Brazil. The area extends from the mouth of Guanabara Bay in the east to Pontal do Recreio in the west. It includes the Tijucas Archipelago, the Cagarras Archipelago, and the Pai, Māe, and Menina Archipelago (Monteiro-Neto et al. 2013). Tijucas Archipelago is found ~2 km from Barra de Tijuca Beach and comprises three main islands (Alfavaca, Pontuda, and Meio) and one outcrop (Machado et al. 2022). Cagarras Archipelago is ~4 km south from Ipanema Beach and includes three main islands (Cagarra, Palmas, and Comprida), three small islands and multiple outcrops (Monteiro-Neto et al. 2013). It also includes two isolated islands found ~9 km from the shore: Redonda and Rasa (Monteiro-Neto et al. 2013). The Pai, Māe, and Menina Archipelago includes three islands of the same name, located ~3 km from the coast. The area is characterised by extensive sandy substrates with small patches of rocky areas covered by red and brown algae, sponges, and corals (Monteiro-Neto et al. 2013). Oceanographic features such as coastal orientation, seasonally wind-driven upwelling, and the limited width of the continental shelf allow for the close proximity of warm tropical water masses and cold waters from the South Atlantic Water Current (Carbonel & Galeão 2007), boosting primary production. Coastal input from associated estuaries, accompanied by a huge influx of organic matter increases benthic biomass (Carreira et al. 2012).

The area overlaps with two marine protected areas, the Marine Extractive Reserve of Itaipú and the Natural Monument of the Cagarras (UNEP-WCMC & IUCN 2025).

This Important Shark and Ray Area is benthic and pelagic and is delineated from inshore and surface waters (O m) to 50 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A - VULNERABILITY

Twenty-five 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, three Endangered species, and five Vulnerable species; threatened rays comprise three Critically Endangered species, six Endangered species, and six Vulnerable species (IUCN 2025).

CRITERION B - RANGE RESTRICTED

This area holds the regular presence of the Angular Angelshark, Spotback Skate, Groovebelly Stingray, Lutz's Stingray, Brazilian Guitarfish, Rio Skate, Bignose Fanskate, and Shortnose Guitarfish as resident range-restricted species. These species have been recorded regularly from artisanal fisheries operating in the area in five sampling periods between 2003–2005 and 2012–2023 (Silva Junior et al. 2008; Silva-Junior et al. 2011; Almeida Marques 2014; Amorim & Monteiro-Neto 2016; Almeida Marques et al. 2020; Araujo et al. 2020; SR Santos unpubl. data 2024). Artisanal fisheries operate with set gillnets, bottom gillnets, trawl nets, artisanal longlines, and handlines deployed at depths <50 m, mostly targeting Whitemouth Croaker *Micropogonias furnieri* and flounders *Paralichthys* spp. From October 2003-September 2004 (twice a week), and October 2004-September 2005 (weekly), 129 fishing trips from artisanal fisheries (ten boats) were monitored in the area (Silva Junior et al. 2008; Silva-Junior et al. 2011). From June 2012-May 2013, artisanal fisheries (ten boats) operating in 15 locations inside the area were monitored, six days a week on average

(Amorim & Monteiro-Neto 2016). From November 2012–May 2014, 41 surveys were conducted at 10 landing sites in the broader Rio de Janeiro state (~650 km of coastline; Almeida Marques 2014; Almeida Marques et al. 2020). Between 2016–2019, fishing activities were monitored through irregular sampling across 41 monitoring trips at two landing sites in the area (Copacabana and Itaipu) and Cabo Frio (~120 km from the area; Araujo et al. 2020). Copacabana was monitored twice a week between September 2018-September 2019 and Itaipu was visited 10 times between January-July 2016. Monitoring was conducted by scientists and was complemented with pictures sent by fishers when sharks were landed. Both areas concentrate ~1,600 fishers. Cabo Frio was visited every three months between 2017–2018 (Araujo et al. 2020). Finally, artisanal fisheries (~1,000 fishers) operating in the area were monitored five times per week between June 2021–July 2023 (SR Santos unpubl. data 2024).

Angular Angelsharks were recorded in three sampling periods. Between 2012-2013, individuals were captured at two locations along the Rio de Janeiro coast and around Rasa and Carragas Islands within this area (Amorim & Monteiro-Neto 2016). Between 2016-2019, three individuals were recorded in two locations (one in Cabo Frio) with two observed in this area (Araujo et al. 2020). From 2021-2023, 51 Angular Angelsharks were recorded in the area from August-December (SR Santos unpubl. data 2024). Monitoring of shrimp trawl fisheries operating in the Sao Paulo area (~300 km southwest of Rio de Janeiro Shelf) recorded 29 individuals between 2015-2016, highlighting the importance of this area for the species (Domingos et al. 2021). This species occurs in the South Brazil Shelf and the Patagonian Shelf Large Marine Ecosystems (LME).

Between 2012-2013, Spotback Skates were recorded in the area at three locations along the Rio de Janeiro coast and around Rasa Island (Amorim & Monteiro-Neto 2016). Of surveys undertaken across the Rio de Janeiro state from 2012-2014, individuals of this species (n = 14) were only recorded in this area with fishers reporting that are caught year-round (Almeida Marques 2014; Almeida Marques et al. 2020). Between 2016-2019, 16 individuals were recorded in two locations from the Rio de Janeiro state (one ~120 km from the area) with 14 observed in this area. Individuals were observed between September-January mostly around Rasa and Redonda Islands (Araujo et al. 2020). From 2021-2023, 24 Spotback Skates were recorded in the area from August-December (SR Santos unpubl. data 2024). Historically, six individuals were recorded between 2003-2005 from artisanal fisheries operating in the area (Silva Junior et al. 2008). Monitoring of shrimp trawl fisheries operating in the Sao Paulo area (~300 southwest of Rio de Janeiro Shelf) recorded only seven individuals between 2015-2016, highlighting the importance of this area for the species (Domingos et al. 2021). This species occurs in the South Brazil Shelf and the Patagonian Shelf LMEs.

Of 72 Groovebelly Stingrays recorded from 2012–2014 across the Rio de Janeiro state, 53 were recorded in this area, with fishers reporting that they are caught year-round (Almeida Marques 2014; Almeida Marques et al. 2020). The remaining individuals were recorded ~100 km northeast from the area (Almeida Marques 2014; Almeida Marques et al. 2020). From 2021–2023, 61 Groovebelly Stingrays were recorded in the area year-round (SR Santos unpubl. data 2024). Historically, 51 individuals were recorded between 2003–2005 from artisanal fisheries operating in the area (Silva Junior et al. 2008; Silva-Junior et al. 2011). Monitoring of shrimp trawl fisheries operating in the Sao Paulo area (~300 southwest of Rio de Janeiro Shelf) recorded only five individuals between 2015-2016, highlighting the importance of this area for the species (Domingos et al. 2021). This species occurs primarily in the South Brazil Shelf and marginally in the East Brazil Shelf and Patagonian Shelf LMEs.

Of surveys undertaken across the Rio de Janeiro state from 2012-2014, Lutz's Stingrays (n = 3) were only recorded in this area (Almeida Marques 2014; Almeida Marques et al. 2020). Between 2016-2019, eight individuals were recorded in the broader Rio de Janeiro area with all individuals recorded in this area. (Araujo et al. 2020). This species was previously recorded as Southern Stingray *Hypanus*

americanus as it was formally described as a different species in 2020 (Petean et al. 2020). Additionally, two individuals were recorded between 2021-2023 (SR Santos unpubl. data 2024). Lutz's Stingray was also observed in underwater visual censuses conducted between 2011-2022 around the islands (Machado et al. 2022). This species occurs primarily in the East Brazil Shelf and marginally in the South Brazil Shelf and North Brazil Shelf LMEs.

Between 2016-2019, 15 Brazilian Guitarfish were recorded in the broader Rio de Janeiro area with five observed in this area. Individuals were observed between May-June and December-February mostly around Rasa Island (Araujo et al. 2020). From 2021-2023, 131 Brazilian Guitarfish were recorded in the area year-round (SR Santos unpubl. data 2024). Historically, 109 individuals were recorded between 2003-2005 from artisanal fisheries operating in the area (Silva Junior et al. 2008; Silva-Junior et al. 2011). This species occurs in the South Brazil Shelf and the Patagonian Shelf LMEs.

Of surveys undertaken across the Rio de Janeiro state from 2012-2014, Rio Skates (n = 35) were only recorded in this area with fishers reporting that are caught year-round (Almeida Marques 2014; Almeida Marques et al. 2020). Between 2016-2019, four individuals were recorded in the broader Rio de Janeiro area with one observed in this area around Cagarra Island (Araujo et al. 2020). Historically, four individuals were recorded between 2003-2005 from artisanal fisheries operating in the area (Silva Junior et al. 2008, 2011). This species occurs in the South Brazil Shelf and the Patagonian Shelf LMEs.

Of surveys undertaken across the Rio de Janeiro state from 2012-2014, Bignose Fanskates (n = 24) were only recorded in this area with fishers reporting seasonal catches (Almeida Marques 2014; Almeida Marques et al. 2020). From 2021-2023, 67 Bignose Fanskates were recorded in the area (SR Santos unpubl. data 2024). Historically, three individuals were recorded between 2003-2005 from artisanal fisheries operating in the area (Silva Junior et al. 2008). Monitoring of shrimp trawl fisheries operating in the Sao Paulo area (~300 southwest of Rio de Janeiro Shelf) recorded only seven individuals between 2015-2016, highlighting the importance of this area for the species (Domingos et al. 2021). This species occurs in the South Brazil Shelf and the Patagonian Shelf LMEs.

Of five Shortnose Guitarfish recorded in the broader Rio de Janeiro area between 2016–2019, four were observed in this area. Individuals were observed in September and January around Cagarra Island and in coastal areas (Araujo et al. 2020). From 2021–2023, 19 individuals were recorded in the area from August-December (SR Santos unpubl. data 2024). Historically, three individuals were recorded between 2003–2005 from artisanal fisheries operating in the area (Silva Junior et al. 2008; Silva-Junior et al. 2011). This species occurs in the South Brazil Shelf and the Patagonian Shelf LMEs.

SUB-CRITERION C1 - REPRODUCTIVE AREAS

Rio de Janeiro Shelf is an important reproductive area for four shark and two ray species.

Pregnant females, neonates, and young-of-the-year (YOY) Brazilian Sharpnose Sharks have been regularly recorded in incidental catches from artisanal fisheries operating in the area between 2003-2005 and 2021-2023 (Andrade et al. 2008; Silva Junior et al. 2008; SR Santos unpubl. data 2024). Of 985 individuals recorded between 2003-2005, 25 (2.5%) measured 38-42 cm total length (TL; Silva Junior et al. 2008). The reported size-at-birth for the species is 33-34 cm TL (Ebert et al. 2021) confirming these were neonate/YOY. Additionally, 37 pregnant females (3.8%) and 54 postpartum females (5.5%) were recorded (Silva Junior et al. 2008). Of 22 individuals recorded between 2016-2019, six were pregnant females (Araujo et al. 2020). Between 2021-2023, 42 Brazilian Sharpnose Sharks (67-85 cm TL) were recorded in the area (SR Santos unpubl. data 2024). Of these, eight were

pregnant females, confirming the regular and contemporary reproductive importance of this area based on the predictable presence these life stages.

Neonate and YOY Caribbean Sharpnose Sharks were regularly recorded in incidental catches from artisanal fisheries operating in the area between 2003-2005 and 2021-2023 (Silva Junior et al. 2008; SR Santos unpubl. data 2024). Of 260 individuals recorded in 2003-2005, 67 (25.8%) measured 41-49 cm TL (Silva Junior et al. 2008; Silva-Junior et al. 2011). The reported size-at-birth for the species is 31-39 cm TL (Ebert et al. 2021) suggesting these individuals were neonate or YOY. These life stages were recorded year-round. Additionally, two pregnant females were recorded. Between 2021-2023, 16 Caribbean Sharpnose Sharks were recorded in the area (SR Santos unpubl. data 2024). Of these, seven (43.8%) measured <50 cm TL confirming the regular and ongoing presence of these life stages. These sharks were recorded in September and February. According to reports from fishers, pregnant females are still caught in the area (SR Santos unpubl. data 2024).

Neonate and YOY Scalloped Hammerheads were regularly recorded in incidental catches from artisanal fisheries operating in the area between 2003-2005 and 2021-2023 (Silva Junior et al. 2008; SR Santos unpubl. data 2024). Of 45 individuals recorded in 2003-2005, 19 (42.22%) measured 51-75 cm TL (Silva Junior et al. 2008; Silva-Junior et al. 2011). The reported size-at-birth for the species is 31-57 cm TL (Ebert et al. 2021) and YOY in Brazil have been reported to grow up to 75 cm TL (Kotas et al. 2011) suggesting these individuals were either neonate or YOY. Additionally, 12 small juveniles (75-85 cm TL) were also recorded (26.7% of sampling size) (Silva Junior et al. 2008). Between 2021-2023, 33 Scalloped Hammerheads were recorded in the area (SR Santos unpubl. data 2024). Of these, four (12.1%) measured <75 cm TL, confirming the regular presence of these life stages. Additionally, 17 individuals (51.5%) were classified as juveniles as they measured between 75-85 cm TL. These sharks were recorded mostly between June-November. According to reports from fishers, pregnant females are caught in the area (SR Santos unpubl. data 2024).

Neonate and YOY Angular Angelsharks have been regularly recorded in incidental catches from artisanal fisheries operating in the area between 2003-2005 and 2021-2023 (Silva Junior et al. 2008; SR Santos unpubl. data 2024). Of 51 individuals recorded between 2021-2023, 18 (35.3%) measured between 30-40 cm TL (SR Santos unpubl. data 2024). The reported size-at-birth for the species is 24-30 cm TL (Ebert et al. 2021), suggesting these individuals were neonate/YOY. According to reports from fishers, pregnant females are caught in the area (SR Santos unpubl. data 2024).

Historically, neonate and YOY Spiny Butterfly Rays were reported from this area between 2003-2005 (Silva Junior et al. 2008; Silva-Junior et al. 2011). Of 19 individuals recorded then, one was reported as a neonate and four as juveniles. Between September 2021-March 2023, artisanal fisheries operating in the area were monitored (SR Santos unpubl. data 2024). Of 82 Spiny Butterfly Rays recorded in the area, 53 (64.63%) measured between 20-50 cm disc width (DW). The reported size-at-birth for the species is 38-44 cm DW (Last et al. 2016), confirming these individuals were either neonate or YOY. These life stages were recorded mostly between July-February (Teixeira-Leite 2022). Additionally, one pregnant female was recorded in 2021 (SR Santos unpubl. data 2024) and fisher report that these life stages are caught in the area (SR Santos unpubl. data 2024).

Between September 2021-March 2023, artisanal fisheries operating in the area were monitored (SR Santos unpubl. data 2024). Of 131 Brazilian Guitarfish recorded in the area, 59 (45.0%) individuals measured between 20-30 cm TL, and two were pregnant females. Size-at-birth for the species is unknown, but for a similar species that matures at similar sizes (Shovelnose Guitarfish *Pseudobatos productus*) the size-at-birth is 20-24 cm TL (Last et al. 2016), suggesting these individuals were either neonate or YOY. These life stages were recorded year-round (Guimarães 2021).

SUB-CRITERION D2 - DIVERSITY

Rio de Janeiro Shelf sustains a high diversity of Qualifying Species (25 species). This matches the regional diversity threshold (25 species) for the South American Atlantic region. The regular presence of Qualifying Species has been documented through monitoring of artisanal fisheries operating in the area, local ecological knowledge, and underwater visual census (Monteiro-Neto et al. 2013; Almeida Marques 2014; Amorim & Monteiro-Neto 2016; Almeida Marques et al. 2020; Araujo et al. 2020; Machado et al. 2022; SR Santos unpubl. data 2024).

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QUALIFYING SPECIES

Scientific Name	Common Name	IUCN Red List Catego ry	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				Α	В	Cı	C2	C3	C4	C5	Dı	D2
SHARKS			1			1	I	1				
Carcharhinus brevipinna	Spinner Shark	VU	0-200	Х								
Carcharhinus falciformis	Silky Shark	VU	O-1,112	Х								
Carcharhinus obscurus	Dusky Shark	EN	0-500	Х								
Carcharias taurus	Sandtiger Shark	CR	O-232	Х								
Isurus oxyrinchus	Shortfin Mako	EN	O-1,888	Х								x
Rhizoprionodon lalandii	Brazilian Sharpnose Shark	VU	0-149	Х		Х						
Rhizoprionodon porosus	Caribbean Sharpnose Shark	VU	0-500	Х		Х						
Sphyrna lewini	Scalloped Hammerhead	CR	0-1,043	Х		Х						
Sphyrna zygaena	Smooth Hammerhead	VU	0-500	Х								
Squatina guggenheim	Angular Angelshark	CR*	7-150	Х	Х	Х						
RAYS												
Aetobatus narinari	Whitespotted Eagle Ray	EN	0-60	Х								
Atlantoraja castelnaui	Spotback Skate	CR	0-300	Х	Х							Х
Atlantoraja cyclophora	Eyespot Skate	EN	0-320	Х								

Scientific Name	Common Name	IUCN Red List Catego	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
		ry	Kunge (m)	Α	В	Cı	C2	C3	C4	C5	Dı	D2
RAYS				I	1	1		1			1	1
Dasyatis hypostigma	Groovebelly Stingray	EN	5-80	Х	Х							
Gymnura altavela	Spiny Butterfly Ray	CR*	0-150	Х		Х						
Hypanus berthalutzae	Lutz's Stingray	VU	0-100	Х	Х							
Myliobatis freminvillei	Bullnose Eagle Ray	VU	O-122	Х								
Myliobatis goodei	Southern Eagle Ray	VU	O-181	Х								
Pseudobatos horkelii	Brazilian Guitarfish	CR	0-150	Х	Х	X						v
Pseudobatos percellens	Chola Guitarfish	EN	O-110	Х								
Rhinoptera bonasus	American Cownose Ray	VU	0-60	Х								
Rhinoptera brasiliensis	Brazilian Cownose Ray	VU	0-20	Х								
Rioraja agassizi	Rio Skate	VU	5-600	Х	Х							
Sympterygia acuta	Bignose Fanskate	CR	O-188	Х	Х							
Zapteryx brevirostris	Shortnose Guitarfish	EN	0-140	Х	Х							

*Considered CR nationally but EN globally.



SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category				
SHARKS						
Galeocerdo cuvier	Tiger Shark	NT				
Mustelus canis	Dusky Smoothhound	NT				
Squalus albicaudus	Brazilian Whitetail Dogfish	DD				
RAYS						
Hypanus guttatus	Longnose Stingray	NT				
Narcine brasiliensis	Lesser Numbfish	NT				
Pteroplatytrygon violacea	Pelagic Stingray	LC				

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 this is an important area for reproductive purposes of two shark and two ray species as well as undefined aggregations of two ray species.

Monitoring of artisanal fisheries operating in the area between 2021-2023 revealed the presence of neonates, YOY, and pregnant females from several species. Of ten Spinner Sharks recorded between 2021-2023, four measured 77-82 cm TL (SR Santos unpubl. data 2024). The reported size-at-birth for the species is ~60-75 cm TL confirming that these individuals were neonate/YOY.

Historically, one pregnant Sandtiger Shark was recorded in the area (Senna & Nunan 2008).

Of 57 Spotback Skates recorded between 2021–2023, neonates and pregnant females were recorded (SR Santos unpubl. data 2024).

Of 67 Bignose Fanskates recorded between 2021-2023, four were pregnant females with egg cases.

Additional information is needed to confirm the regularity of these life stages and the reproductive importance of the area.

Aggregations of American Cownose Rays and Brazilian Cownose Rays have been recorded in the area and reported by fishers. In 2023, a group of 50 individuals was incidentally caught by artisanal fisheries (SR Santos unpubl. data 2024). Additional information is needed to confirm the regularity of these aggregations and the importance of the area compared to others in the region.

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