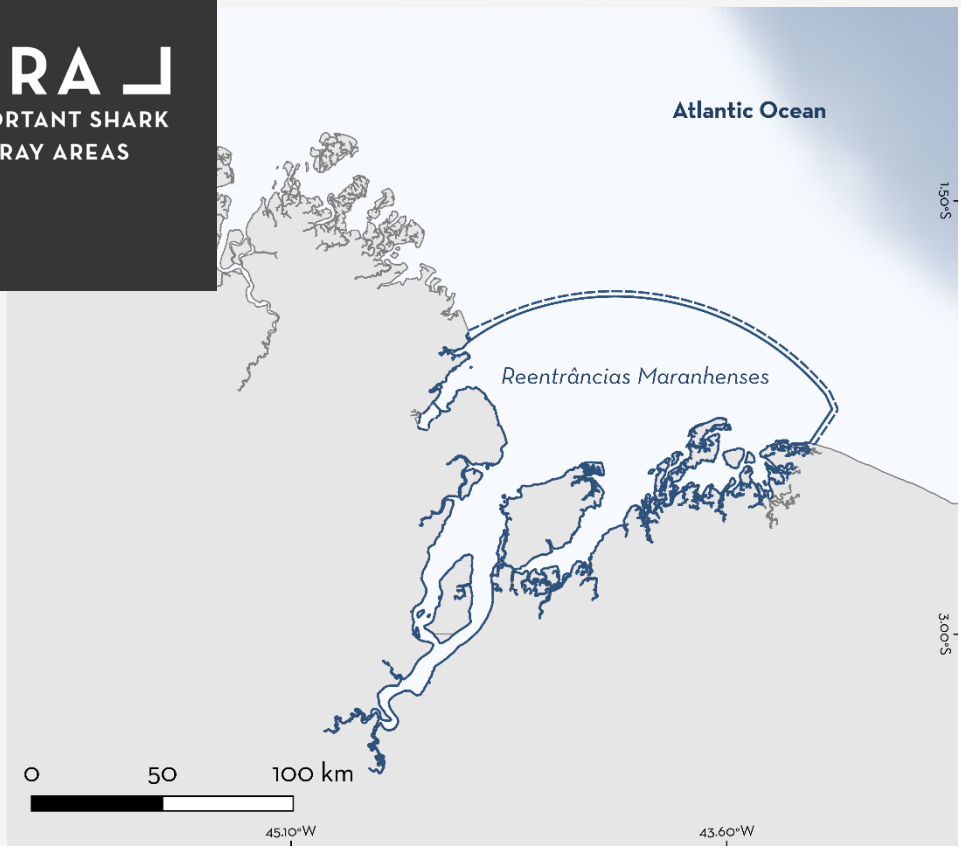
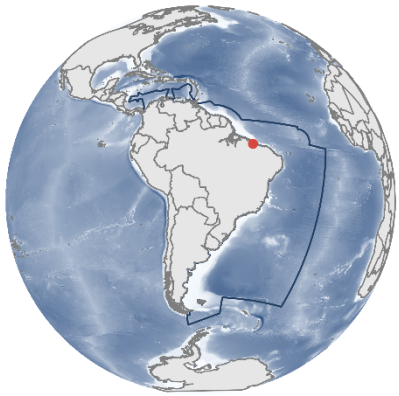
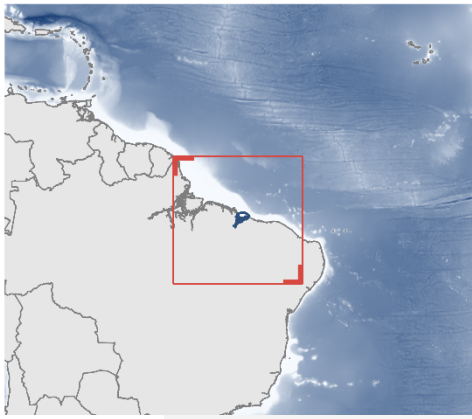
ISRA
IMPORTANT SHARK AND RAY AREAS







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

REENTRÂNCIAS MARANHENSES ISRA

South American Atlantic Region

BRAZIL

0–100 metres

9,850.5 km²

SUMMARY

Reentrâncias Maranhenses is located in Maranhão State, Brazil. The area includes an estuarine habitat that is characterised by mangrove forests and muddy, sandy, and rocky substrates. It is influenced by discharge from numerous rivers including the Amazon River. Within this area there are: **threatened species** (e.g., Wingfin Stingray *Fontitrygon geijskesi*); **range-restricted species** (e.g., Daggernose Shark *Isogomphodon oxyrhynchus*); **reproductive areas** (e.g., Largetooth Sawfish *Pristis pristis*).

CRITERIA

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

DESCRIPTION OF HABITAT

Reentrâncias Maranhenses is located in the Maranhão state in Brazil. The area comprises a dynamic estuarine habitat under seasonal influence of the Amazon River discharge (Fagundes et al. 2018). Reentrâncias Maranhenses is influenced by the other rivers, including the Itapecuru, Munim, Mearim, and Pindaré rivers. The area is characterised by a heavily indented coastline with abundant mangrove forests and highly productive waters (Filizola et al. 2025). It includes parts of the continental shelf with depths up to 100 m (Palma 1979). The area is also characterised by muddy substrate with patchy sandy and rocky substrates (Camargo & Isaac 2003).

This Important Shark and Ray Area is benthic and pelagic and is delineated from inshore and surface waters (0 m) to 100 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 Daggernose Shark (Pollom et al. 2020b), Wingfin Stingray (Pollom et al. 2020a), and Largetooth Sawfish (Espinoza et al. 2022); and the Vulnerable Atlantic Nurse Shark (Carlson et al. 2021).

CRITERION B – RANGE RESTRICTED

Reentrâncias Maranhenses holds the regular presence of Daggernose Shark and Wingfin Stingray as resident range-restricted species. Both species only occur in the Brazil North Shelf Large Marine Ecosystem.

Historically, between December 1989–September 1991, 1,135 Daggernose Sharks were recorded from gillnet fishery surveys. Since the 1990's, catches have decreased in abundance by 90% (Lessa et al. 2006; Almeida et al. 2014). There are at least nine contemporary records of Daggernose Sharks in this area. Between 2018–2020, four animals were opportunistically sampled in fish markets from fishers operating within the area (Lessa & Feitosa 2021). This included the largest individual of this species ever recorded, a female measuring 148.3 cm total length (TL). The other three individuals were juveniles, measuring 76–80.5 cm TL. The average size-at-birth of this species is ~43 cm TL (Lessa et al. 2000). A young-of-the-year (YOY) Daggernose Shark was captured ~110 km from the Pindaré River mouth in December 2016 (Feitosa et al. 2020). An additional individual was captured in the area by the artisanal longline fleet between 2018–2019 (Wosnick et al. 2023); a large female measuring 122 cm TL. Further, additional records of five immature Daggernose Sharks captured in the area were shared on social media in 2023 and 2024. The species corresponded to about 10% of shark captures of the first recorded exploitation (1983–1985), reaching 71 kg/km in the second (1990–1991) (Lessa 1986; Stride et al. 1992). This area is the only known remaining area with contemporary catch records in Brazil. This area has particular importance given the species has experienced a population decline of >90% in the last three decades (Lessa et al. 2016).

Between 1997–2000, seven Wingfin Stingrays were recorded from drift gillnets and beach seine surveys. Between 2019–2024, at least 188 Wingfin Stingrays were caught by fishers with gillnets or longlines in this area. Out of these 188 individuals, 161 were sampled between 2023–2024 from 95 field sampling trips, observing landings of the small-scale commercial gillnet and longline fleet in

Raposa, Maranhão state (Dias 2024). In this sampling effort, Wingfin Stingrays were present in all landings and corresponded to the second most frequently recorded ray species, after the Longnose Stingray (Dias 2024). The remaining 27 individuals were sampled opportunistically from the same fishing fleet, comprising 17 males and 10 females. This comprised one embryo, five neonates, 15 immature individuals, and four adults. Sizes ranged between 15–78 cm disc width (DW). This is one of the few known areas globally where this species is regularly and predictably observed.

SUB-CRITERION C1 – REPRODUCTIVE AREAS

This is an important reproductive area for one shark and one ray species.

In 2018, two pregnant Atlantic Nurse Sharks were caught and landed in this area (LM Feitosa pers. obs. 2025). Between April–October 2023, 201 Atlantic Nurse Sharks were captured by small-scale commercial longlines within this area, measuring 190–270 cm TL (Pedrosa 2024). Out of these, ~140 (69.7%) were determined to be either pregnant with embryos at different development stages or in distinct reproductive stages, since some were dissected by fishers. The pregnancy state for each landed female was assigned based on reliable reports from the fishers, and reproductive tracts left behind (V Pedrosa pers. obs. 2024). Pregnant females were sampled every month of the study period. This area is one of the last places on the coast of Brazil where pregnant Atlantic Nurse Sharks are regularly recorded (Martins et al. 2018), others are found around oceanic islands.

This area holds one of the largest known clusters of contemporary Largetooth Sawfish records in Brazil and the South American Atlantic region, making it internationally significant. Between 1984–2008, five animals were captured in the area, measuring from 70–700 cm TL. In addition, 11 records of captures between 2009–2016 were likely to be Largetooth Sawfish. Between 2009–2016, six Largetooth Sawfish were caught by small-scale commercial fishers with gillnets in the area, measuring 120–500 cm TL. These records included pregnant females with near-term embryos (Nunes et al. 2016). Since 2016, there have been records of six individuals caught in the area, comprising YOY and adults (Feitosa et al. 2017; Oimparcial 2024; JLS Nunes pers. obs. 2025). At least three were YOY/juvenile measuring 110, 114, and 152 cm TL, and were caught in Mearim River in this area (Feitosa et al. 2017). The known size-at-birth for the species is 72–90 cm TL (Peverell 2008). The size-at-maturity of this species is ~300 cm TL for females and between 280–300 cm TL for males (Kyne et al. 2021). In January 2016 and 2017, eight artisanal fishers from the cities of Raposa and Vitória do Mearim (where sawfish captures have been reported) reported historical reports of the species in the area. Sawfish meat from one individual caught in the area in late 2023 was observed at a local market (G Rincon pers. obs. 2025). In addition, fishers captured one individual in November 2019 (LM Feitosa pers. obs. 2025), and another in July 2024 (Oimparcial 2024). The area is one of the last locations in Brazil where Largetooth Sawfish can still be found, especially at early life stages (Feitosa et al. 2017).

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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												
Ginglymostoma cirratum	Atlantic Nurse Shark	VU	0–130	X		X						
Isogomphodon oxyrhynchus	Daggernose Shark	CR	4–40	X	X							
RAYS												
Fontitrygon geijskesi	Wingfin Stingray	CR	0–80	X	X							
Pristis pristis	Largetooth Sawfish	CR	0–60	X		X						

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Carcharhinus acronotus	Blacknose Shark	EN
Carcharhinus leucas	Bull Shark	VU
Carcharhinus limbatus	Blacktip Shark	VU
Carcharhinus porosus	Smalltail Shark	CR
Galeocerdo cuvier	Tiger Shark	NT
Rhizoprionodon lalandii	Brazilian Sharpnose Shark	VU
Rhizoprionodon porosus	Caribbean Sharpnose Shark	VU
Sphyrna alleni	Shovelbill Shark	NE
Sphyrna lewini	Scalloped Hammerhead	CR
Sphyrna mokarran	Great Hammerhead	CR
Sphyrna tudes	Smalleye Hammerhead	CR
RAYS		
Aetobatus narinari	Whitespotted Eagle Ray	EN
Gymnura micrura	Smooth Butterfly Ray	NT
Hypanus guttatus	Longnose Stingray	NT
Pseudobatos percellens	Chola Guitarfish	EN
Rhinoptera bonasus	American Cownose Ray	VU
Urotrygon microphthalmum	Smalleye Round Ray	CR

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; NE, Not Evaluated

SUPPORTING INFORMATION

There are additional indications that this area may be important for the reproductive purposes of one shark species.

From the 584 female Smalltail Sharks recorded from gillnet fisheries in the area between 1984–1985, 47 were sexually mature, including six pregnant females (Lessa et al. 1999). The remaining females were either recently mature (n = 35) or ovulating (n = 4) (Lessa et al. 1999). Nine Smalltail Shark individuals were recorded between 2017–2018 (Feitosa et al. 2020). These individuals comprised juvenile and adult males and females, and survey results demonstrated that these individuals fulfilled their entire life cycles within the area, from parturition to sexual maturity, and reproduction. An adult female Smalltail Shark with a mating scar was observed in 2018 (Feitosa et al. 2020). Samples were collected from 86 individuals of this species captured within this area, however, information on sizes was not available (Pedrosa 2024). Further information is required to determine the regularity and predictability of contemporary observations that support the reproductive importance of this area for this species.

REFERENCES

Almeida ZS, Santos NB, Carvalho-Neta RNF, Pinheiro AL. 2014. Análise multidisciplinar das pescarias de emalhe da pescada amarela, de camarão de muruada e da catação do caranguejo uçá em três municípios do Maranhão. In: Haimovici M, Andrigueto JM, Sunyé PS. (Eds.), A Pesca Marinha e Estuarina no Brasil: Estudos de Caso Multidisciplinares. Editora FURG, Rio Grande 161–170.

Camargo M, Isaac VJ. 2003. Ictiofauna estuarina. In: Fernandes MEB (ed) Os manguezais da Costa Norte Brasileira. Fundação Rio Bacanga, São Luís 105–142.

Carlson J, Charvet P, Blanco-Parra MP, Briones Bell-lloch A, Cardenosa D, Derrick D, Espinoza E, Herman K, Morales-Saldaña JM, Naranjo-Elizondo B, et al. 2021. *Ginglymostoma cirratum*. *The IUCN Red List of Threatened Species* 2021: e.T144141186A3095153. https://dx.doi.org/10.2305/IUCN.UK.2021 1.RLTS.T144141186A3095153.en

Dias HN. 2024. A Captura Artesanal De Raias Marinho-estuarinas No Litoral Amazônico Brasileiro e a Caracterização de Sua Cadeia Produtiva Por Meio do Monitoramento do Desembarque e Conhecimento Ecológico Local. Unpublished Master Thesis. São Luís: Universidade Federal do Maranhão.

Espinoza M, Bonfil-Sanders R, Carlson J, Charvet P, Chevis M, Dulvy NK, Everett B, Faria V, Ferretti F, Fordham S, et al. 2022. *Pristis pristis*. *The IUCN Red List of Threatened Species* 2022: e.T18584848A58336780. https://dx.doi.org/10.2305/IUCN.UK.2022-2.RLTS.T18584848A58336780.en.

Fagundes M, Junior ART, Dias FJDS, de Castro ACL, Santos EDV, Soares RDA, Neta RN. 2018. The eventual presence of freshwater of Amazonas river over the continental shelf of the state of Maranhão–Brazil. In AIP Conference Proceedings (Vol. 2040, No. 1). AIP Publishing.

Feitosa LM, Dressler V, Lessa RP. 2020. Habitat use patterns and identification of essential habitat for an endangered coastal shark with vertebrae microchemistry: the case study of *Carcharhinus porosus*. *Frontiers in Marine Science* 7: 1–12. https://doi.org/10.3389/fmars.2020.00125

Feitosa LM, Martins APB, Nunes JLS. 2017. Sawfish (Pristidae) records along the Eastern Amazon coast. E*ndangered Species Research* 34: 229–234. https://doi.org/10.3354/esr00852

Filizola N, Marinho R, Freitas C, Ribas C, Zuanon J, Fearnside P, Moreira-Turcq P. 2025. Amazonas. In: Graça MAS, Callisto M, Teixeira de Mello F, Rodríguez-Olarte D, eds. *Rivers of South America*. Amsterdam: Elsevier, 213–237.

Kyne P, Oetinger M, Grant M, Feutry P. 2021. Life history of the Critically Endangered largetooth sawfish: A compilation of data for population assessment and demographic modelling. *Endangered Species Research* 44: 79–88. https://doi.org/10.3354/esr01090

Lessa RP. 1986. Contribuição ao conhecimento da biologia de *Carcharhinus porosus* Ranzani, 1839 (PISCES, CHONDRICHTHYES) das Reentrâncias Maranhenses. *Acta Amazonica* 16/17: 73–86.

Lessa R, Batista VS, Santana FM. 2016. Close to extinction? The collapse of the endemic daggernose shark (*Isogomphodon oxyrhynchus*) off Brazil. *Global Ecology and Conservation* 7: 70–81. https://doi.org/10.1016/j.gecco.2016.04.003

Lessa R, Santana FM, Batista V, Almeida Z. 2000. Age and growth of the daggernose shark, *Isogomphodon oxyrhynchus*, from northern Brazil. *Marine and Freshwater Research* 51: 339–347.

Lessa R, Santana F, Menni R, Almeida Z. 1999. Population structure and reproductive biology of the smalltail shark (*Carcharhinus porosus*) off Maranhão (Brazil). *Marine and Freshwater Research* 50: 383–388.

Martins APB, Feitosa LM, Lessa RP, Almeida ZS, Heupel M, Silva WM, Tchaicka L, Nunes JLS. 2018. Analysis of the supply chain and conservation status of sharks (Elasmobranchii: Superorder Selachimorpha) based on fisher knowledge. *PLoS ONE* 13(3): 1–15. https://doi.org/10.1371/journal.pone.0193969

Nunes JLS, Rincon G, Piorski NM, Martins APB. 2016. Near-term embryos in a *Pristis pristis* (Elasmobranchii: Pristidae) from Brazil. *Journal of Fish Biology* 89(1): 1112–1120. https://doi.org/10.1111/jfb.12946

Oimparcial. 2024. Endangered sawfish found by fishermen in São Luís. Available at:

https://oimparcial.com.br/noticias/2024/07/ameacado-de-extincao-peixe-serra-e-encontrado-por-pescadores-em-sao-luis/ Accessed February 2025.

Palma JJC. 1979. Geomorfologia da Plataforma Continental Norte Brasileira. *Sé Palmarie Projeto REMAC* 7: 25–51.

Pedrosa VB. 2024. O comércio da carne e a captura de tubarões por embarcações com uso de espinhel na localidade da Raposa, MA: dinâmica e possíveis impactos. Programa de Pós-Graduação em Oceanografia, Universidade Federal do Maranhão-UFMA, São Luís do Maranhão.

Peverell SC. 2008. Sawfish (Pristidae) of the Gulf of Carpentaria, Queensland, Australia. Unpublished Masters Thesis, James Cook University, Townsville.

Pollom R, Charvet P, Faria V, Herman K, Lasso-Alcalá O, Marcante F, Nunes J, Rincon G. 2020a. *Fontitrygon geijskesi*. *The IUCN Red List of Threatened Species* 2020: e.T60153A104172152. https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T60153A104172152.en

Pollom R, Charvet P, Faria V, Herman K, Lasso-Alcalá O, Marcante F, Nunes J, Rincon G, Kyne PM. 2020b. *Isogomphodon oxyrhynchus*. *The IUCN Red List of Threatened Species* 2020: e.T60218A3094144. https://dx.doi.org/10.2305/IUCN.UK.20203.RLTS.T60218A3094144.en

Stride RK, Batista VS, Raposo LA. 1992. *Pesca experimental de tubarão com redes de emalhar no litoral maranhense*. Maranhão: Universidade Federal do Maranhão, 3: 160.

Wosnick N, Charvet P, Hauser-Davis RA, Rincon G, Nunes AROP, Nunes JLS. 2023. Unveiling the threats beneath: fish mislabeling in the Brazilian Amazon Coast and its impacts on the critically endangered daggernose shark. *Fisheries* 52: 1–5. https://doi.org/10.1002/fsh.10983