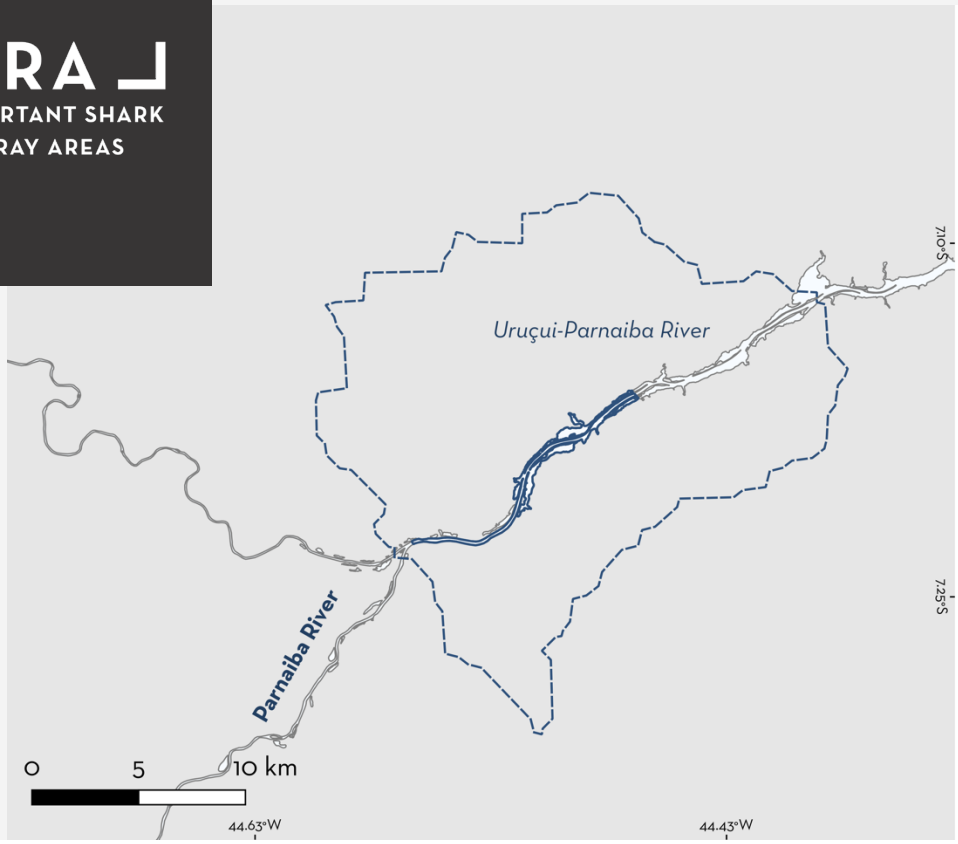
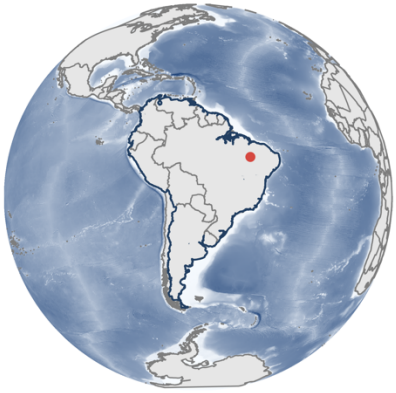
ISRA
IMPORTANT SHARK AND RAY AREAS





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. Buffers for freshwater areas are determined based on hydroBASINS to capture watershed boundaries.

URUÇUI-PARNAIBA RIVER ISRA

South American Inland Waters Region

BRAZIL

0–3 metres

4.96 km²

SUMMARY

Uruçui-Parnaiba River is located in northeastern Brazil. It is situated in the upper section of the Parnaiba River Basin, in the state of Piaui. This area is characterised by semi-arid ecosystems marked by an extreme hydrological cycle with a long, severe, dry season. Within this area there are: **threatened species**, **reproductive areas**, and **feeding areas** (Parnaiba Freshwater Stingray *Potamotrygon signata*).

CRITERIA

Criterion A – Vulnerability; Sub-criterion C1 – Reproductive Areas; Sub-criterion C2 – Feeding Areas

DESCRIPTION OF HABITAT

Uruçui-Parnaiba River is located in northeastern Brazil. It is situated in the upper section of the Parnaiba River Basin, in the state of Piauí. The Parnaiba River originates in the Mangabeiras Plateau at ~800 m above sea level. In the upper and mid reaches of the basin, a semiarid climate prevails, characterised by high temperatures (often exceeding 28°C) and low, irregular precipitation of ~700 mm annually, mostly falling between January–June with occasional severe droughts lasting several years (Graca et al. 2025).

This region, where only a few rivers are perennial, is predominantly semi-arid—covering about 60% of the area—with prolonged periods of water scarcity lasting six months or more (Maltchik 1999; Graca et al. 2025). The extreme hydrological fluctuations, high temperatures, and low oxygen levels create a challenging environment for vegetation and freshwater organisms (Graca et al. 2025). The local biome is characterised by the *caatinga*, a seasonal tropical forest composed of shrubby deciduous open forests specially adapted to limited water availability.

This Important Shark and Ray Area is benthic and is delineated from surface waters (0 m) to 3 m based on the depth range of Qualifying Species in the area.

ISRA CRITERIA

CRITERION A – VULNERABILITY

One Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occurs in the area. This is the Vulnerable Parnaiba Freshwater Stingray (Rosa et al. submitted).

SUB-CRITERION C1 – REPRODUCTIVE AREAS

Uruçui-Parnaiba River is an important reproductive area for one ray species.

The Parnaiba Freshwater Stingray is endemic to the Parnaiba River drainage in northeastern Brazil, in the states of Piauí and Maranhão (Rosa 1985; Moro & Rosa 2016). From the ichthyological collections of Federal University of Paraíba, of the 82 Parnaiba Freshwater Stingrays sampled in 2009, 73 (89%) were collected in this area, highlighting the importance of this area (Y Torres unpubl. data 2024).

Between 2008–2010, during the dry and rainy seasons, Parnaiba Freshwater Stingrays were also sampled at five different sites along the distributional range of this species: Picos (Guaribas River), Valença do Piauí (Sambito River), Santa Cruz dos Milagres (São Nicolau River), Ribeiro Gonçalves (Parnaiba River), and this area. These sampling sites were located at distances between 80–300 km from this area. Individuals were collected through fishery independent surveys that used cast nets, trawl nets, *tarrafas* (net that is thrown by hand, often weighted), and harpoons (Moro et al. 2012)

A total of 66 Parnaiba Freshwater Stingrays (38 females and 28 males) were collected across these five sites. Within this area, 46 individuals (28 females and 16 males) were collected with body sizes ranging between 18.4–30.9 cm disc width (DW). Overall, 15 pregnant females (determined by the presence of embryos at different stages) were collected across these five sites, with 12 collected in this area. This represented 46% of adult females (n = 26) sampled in this area and 80% of pregnant females were collected in this area. Males had calcified claspers and the presence of abundant

semen which suggests that copulation also occurs within this area (Moro et al. 2012). Therefore, this area serves as an important reproduction site for this species, and the only identified critical area along the species' distributional range.

SUB-CRITERION C2 – FEEDING AREAS

Uruçui-Parnaiba River is an important feeding area for one ray species.

Between 2009–2010, Parnaiba Freshwater Stingrays were collected in this area through fishery independent surveys that used seine nets, gillnets, spears, and cast nets (Moro et al. 2012). The stomach contents of 56 specimens (36 females, 23 males; 7 immature, 49 mature) were analysed, of which 56 (94.9%) had food items. The Index of Relative Importance (%IRI) results showed a strong preference for insects (98.8%), with a dominance of Diptera larvae (60.6%) and mayflies' nymphs Ephemeroptera (34.7%). This indicates that the Parnaiba Freshwater Stingray is an insectivorous species (Moro et al. 2012). The seasonal hydrological changes in the *caatinga* portion of the Parnaiba Basin strongly influence fish populations, leading to significant variations in their abundance and availability. The insectivorous diet of the Parnaiba Freshwater Stingray may serve as an adaptive response to the unpredictable availability of fish during different seasons (Moro 2010; Moro et al. 2012).

The Parnaiba River drainage, located in a semi-arid region, experiences an extreme and unique hydrological cycle characterised by marked seasonal fluctuations. Within this basin, the distribution of the Parnaiba Freshwater Stingray is highly fragmented and isolated from other river basins (Rosa et al. submitted). During the dry periods, the reduction in available habitat leads to aggregation of the species, a pattern likely driven by the severe and prolonged dry seasons typical of this region (Rosa et al. 2009). Insects play a crucial role in the aquatic ecosystems of the Parnaiba Basin. The permanent bodies of water, which persist even during the long dry season, act as important breeding areas for Diptera larvae and mayfly nymphs. These nymphs spend months to years in the water, thriving in stable aquatic habitats and contributing significantly to the diet of Parnaiba Freshwater Stingray. Therefore, this area is critical as it constitutes one of the few permanent water bodies within the distribution of the Parnaiba Freshwater Stingray in which their main prey items are present year-around.

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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												
Potamotrygon signata	Parnaiba Freshwater Stingray	VU	0–3	X		X	X					

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
RAYS		
Potamotrygon orbignyi	Reticulate Freshwater Stingray	LC

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.

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