

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.

## FREMANTLE ISRA

### Australia and Southeast Indian Ocean Region

#### SUMMARY

Fremantle is located in southwest Western Australia, Australia. This area covers ~17 km of coastline interrupted by the Swan Estuary. The habitat is characterised by a combination of sand with a mix of limestone reefs, macroalgae, and seagrass meadows. Nearshore circulation is strongly influenced by wave-driven mechanisms, particularly around coastal groynes, where persistent longshore currents and rip currents are generated by wave set-up variations. Within this area there are: **range-restricted species** (Masked Stingaree *Trygonoptera personata*); and **reproductive areas** (Port Jackson Shark *Heterodontus portusjacksoni*).

#### CRITERIA

**Criterion B - Range Restricted; Sub-criterion C1 - Reproductive Areas**

— AUSTRALIA —

— 0-18 metres —

— 20.36 km<sup>2</sup> —





## DESCRIPTION OF HABITAT

Fremantle is located in southwest Western Australia, Australia. This area covers ~17 km of coastline interrupted by the Swan Estuary. The habitat is characterised by a combination of soft sediments with a mix of limestone reefs, macroalgae, and seagrass meadows (Lemmens et al. 1996; Wakefield et al. 2013). Several human structures are also encompassed in this area, such as shipwrecks, artificial reefs, piers and rock walls, and shipping channels (Hammond et al. 2020).

Nearshore circulation is strongly influenced by wave-driven mechanisms, particularly around coastal groynes, where persistent longshore and rip currents are generated (Olson & Pattiaratchi 2005; Pattiaratchi et al. 2009). In addition, the Leeuwin Current exerts a significant regional influence by transporting warm, low-salinity tropical waters southward (Benthuisen et al. 2014; Rennie et al. 2009). The nutrient dynamics are driven by a combination of upwelling and submarine groundwater discharge, resulting in higher nutrient levels, particularly for nitrate, in austral winter and autumn (Johannes et al. 1994; Hamilton et al. 2006; Machado & Imberger 2013). Temperature, salinity, and wave dynamics also vary seasonally, with thermal stratification in summer and enhanced mixing during winter (Zaker et al. 2007; Zhu et al. 2025).

This Important Shark and Ray Area is benthic and pelagic and is delineated from inshore and surface waters (0 m) to a depth of 18 m based on the bathymetry of the area.

## ISRA CRITERIA

### CRITERION B – RANGE RESTRICTED

This area holds the regular presence of Masked Stingaree as a resident range-restricted species.

Of 305 Masked Stingaree records available on iNaturalist from across the species' entire geographic range, 201 observations (65.9%) are from within this area (iNaturalist 2025). Records show the species occurrence every year between 2015–2025 (except in 2017), highlighting regular occurrence across years. When compared to the broader surrounding region, this area had a far higher proportion of records than elsewhere, with Cape Naturaliste having 3.9% (n = 12) of records and Rottnest Island 1% (n = 3) (iNaturalist 2025). These citizen science records include at least six animals visually estimated as pregnant based on their distended abdomens. Pregnant females were reported from February 2021 (n = 2), 2022 (n = 2), and 2024 (n = 2), suggesting that this area might be important for the reproduction of Masked Stingaree (iNaturalist 2025). Masked Stingaree mating occurs in late autumn and mid-winter and parturition occurs in April and May (White et al. 2002). Masked Stingaree is restricted to the South West Australia Shelf Large Marine Ecosystem (LME) and the West Central Australian Shelf LME.

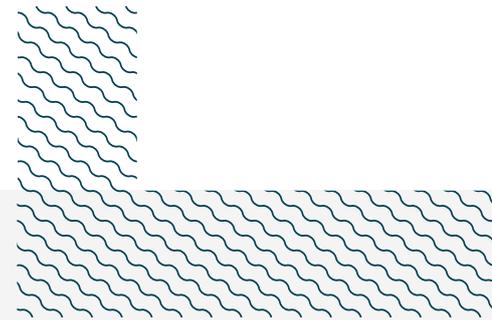
### SUB-CRITERION C<sub>1</sub> – REPRODUCTIVE AREAS

Fremantle is an important reproductive area for one shark species.

Between 2018–2025, recreational divers from the University of Western Australia (UWA) Underwater Dive Club visited this area at least once a month year-round and frequently observed ~3 neonate/young-of-the-year (YOY) Port Jackson Sharks (Nico Fassbender unpubl. data). Sharks were observed on sandy substrates interspersed between patches of seagrass. Individuals were visually estimated to measure ~20–30 cm total length (TL), with the largest individuals observed at

~30 cm TL. Size-at-birth for this species is 23–24 cm TL (Ebert et al. 2021). Neonates and YOY were present in the area year-round.

Citizen science records also highlight the importance of this area for early life-stages of Port Jackson Sharks (iNaturalist 2025). In addition to four egg case records, all 108 Port Jackson Shark observations reported from this area between 2016–2025 consist of individuals visually identified as neonates or YOY. These individuals were recorded every year in this period (average = 11 per year) and every month but July (average = 9 per month). Life-stage was determined by their characteristic slender bodies and whitish colouration at these smaller sizes. The importance of this area for reproductive purposes is highlighted by the exclusive observations of neonate/YOY individuals compared to other life-stages (iNaturalist 2025).



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Naima Andrea López (Marine Futures Lab, University of Western Australia), Nico Fassbender (Marine Futures Lab, University of Western Australia), and Vanessa Bettcher Brito (IUCN SSC Shark Specialist Group – ISRA Project) contributed and consolidated information included in this factsheet. We thank all participants of the 2025 ISRA Region 08 – Australia and Southeast Indian Ocean workshop for their contributions to this process.

We acknowledge the Traditional Owners of Country throughout Australia and recognise the continuing connection to land, waters, and culture. We pay our respects to Elders past, present, and emerging.

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## **Suggested citation**

**IUCN SSC Shark Specialist Group. 2025.** Fremantle ISRA Factsheet. Dubai: IUCN SSC Shark Specialist Group.

## QUALIFYING SPECIES

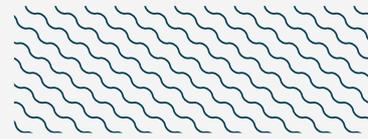
Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				A	B	C1	C2	C3	C4	C5	D1	D2
<b>SHARKS</b>												
<i>Heterodontus portusjacksoni</i>	Port Jackson Shark	LC	0-275			X						
<b>RAYS</b>												
<i>Trygonoptera personata</i>	Masked Stingaree	LC	0-115		X							

## SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
<b>SHARKS</b>		
<i>Aulohalaelurus labiosus</i>	Blackspotted Catshark	LC
<i>Parascyllium variolatum</i>	Varied Carpetshark	LC
<b>RAYS</b>		
<i>Aptychotrema vincentiana</i>	Western Shovelnose Ray	LC
<i>Hypnos monopterygius</i>	Coffin Ray	LC
<i>Trygonoptera mucosa</i>	Western Shovelnose Stingaree	LC
<i>Trygonoptera ovalis</i>	Striped Stingaree	LC
<i>Trygonorrhina dumerilii</i>	Southern Fiddler Ray	LC
<i>Urolophus circularis</i>	Circular Stingaree	LC
<i>Urolophus paucimaculatus</i>	Sparsely-spotted Stingaree	LC

*IUCN Red List of Threatened Species Categories are available by searching species names at [www.iucnredlist.org](http://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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