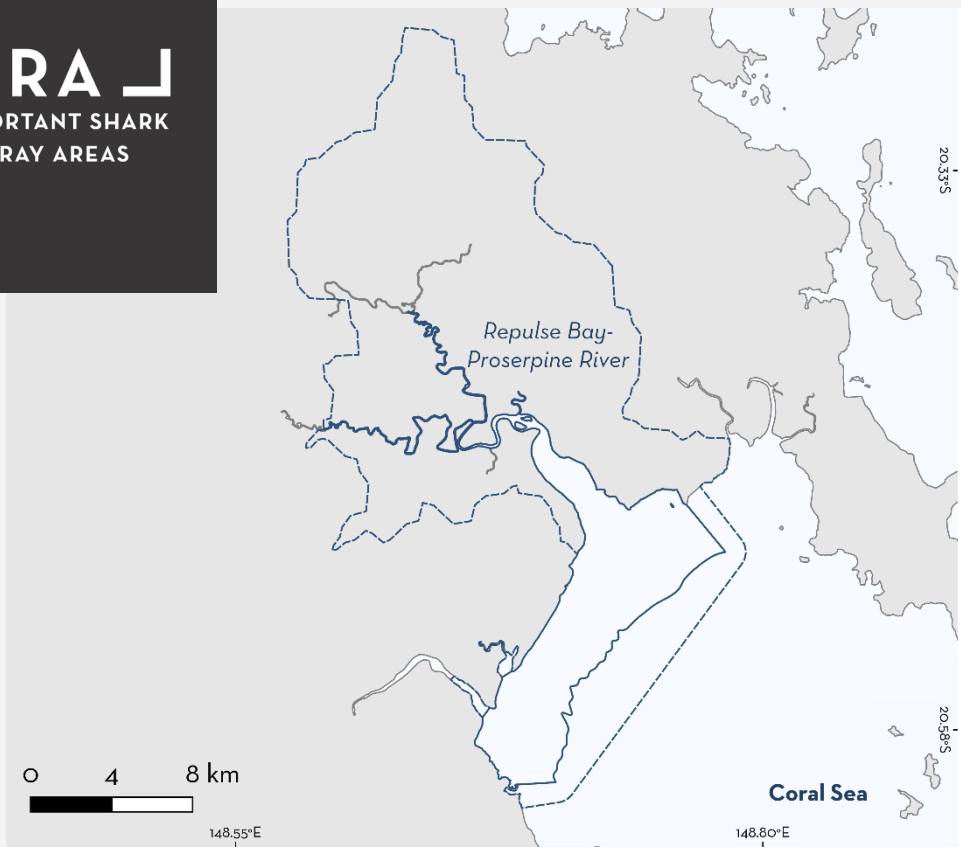
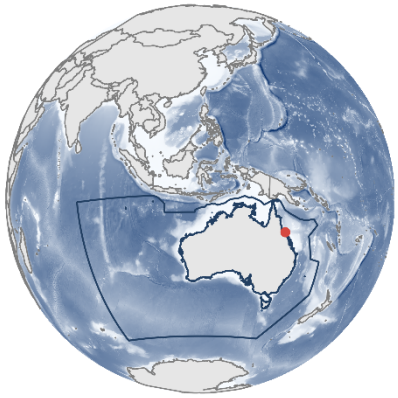
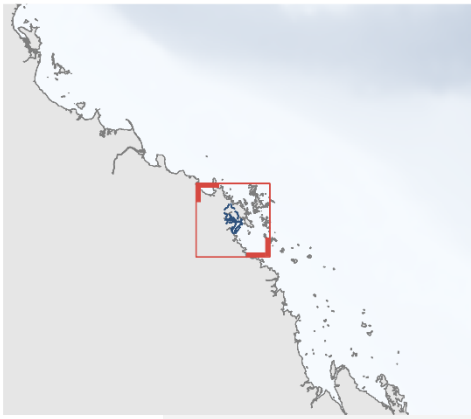
ISRA
IMPORTANT SHARK AND RAY AREAS







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.

AUSTRALIA

0–10 metres

75.24 km²

REPULSE BAY-PROSERPINE RIVER ISRA

Australia and Southeast Indian Ocean Region

SUMMARY

Repulse Bay-Proserpine River is located in the Whitsunday Coast region of north Queensland, Australia. It encompasses the estuaries of the O'Connell River and Thompson Creek and includes the lower reaches of the Proserpine River. The area is characterised by extensive mangroves, intertidal sand flats, saltmarsh, silty substrates, and mudflats. It is influenced by freshwater and sediment input from the rivers, tidal saltwater intrusion upstream, high water turbidity, and a tropical climate. It overlaps with the Repulse Bay to Ince Bay Key Biodiversity Area and the Great Barrier Reef Marine Park. Within this area there are: **threatened species** (e.g., Blacktip Shark *Carcharhinus limbatus*) and **reproductive areas** (e.g., Narrow Sawfish *Anoxypristis cuspidata*).

CRITERIA

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

DESCRIPTION OF HABITAT

Repulse Bay-Proserpine River is located in the Whitsunday Coast region of north Queensland, Australia. It encompasses the estuaries of the O'Connell River and Thompson Creek and includes the lower reaches of the Proserpine River from ~5 km east of the town of Proserpine to the river mouth. The 100 km long Proserpine River has a catchment area of ~2,500 km^2 and empties into Repulse Bay in the coastal waters of the Great Barrier Reef (Queensland Government 2013). The area is characterised by extensive mangroves, intertidal sand flats, saltmarsh, silty substrates, and mudflats (Queensland Government 2013).

The area is influenced by a tropical climate with a wet season in the austral summer between January–March and by southeasterly winds and high water turbidity. Annual rainfall in the catchment averages ~1,500 mm and annual river discharge is 2,150 GL (Queensland Government 2025). Mean tidal range in the area is 3.7 m on spring tides (Bruinsma & Danaher 2001). It is also influenced by freshwater and sediment input from the river, and by tidal saltwater intrusion into the river. The tidal influence reaches ~20 km upstream, while the area's boundary extends slightly further upstream, resulting in freshwater habitat as well as a gradient of salinity levels in the lower reaches of the estuary.

Repulse Bay-Proserpine River overlaps with the Repulse Bay to Ince Bay Key Biodiversity Area (KBA 2025) and the Great Barrier Reef Marine Park – Marine National Park Zone (UNEP-WCMC & IUCN 2025).

This Important Shark and Ray Area is benthic and pelagic and is delineated from inshore and surface waters (0 m) to 10 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 Narrow Sawfish (Haque et al. 2023), and the Vulnerable Pigeye Shark (Simpfendorfer et al. 2021), Blacktip Shark (Rigby et al. 2021a), and Bull Shark (Rigby et al. 2021b).

SUB-CRITERION C1 – REPRODUCTIVE AREAS

Repulse Bay-Proserpine River is an important reproductive area for four shark and one ray species.

Between 2009–2012, observer data were gathered from vessels operating in the commercial gillnet sector of the Queensland East Coast Inshore Finfish Fishery from foreshore nets placed in the area (Harry et al. 2011a). Additionally, between January 2012 and March 2014, fishery-independent surveys occurred over eight sampling efforts, each lasting at least 5 weeks. During each round, each bay (this area included) received at least 8 gillnet and 10 longline deployments over four days. Benthic-set gillnets (114 mm mesh, 200–400 m long) were deployed for ~1 hour each with a total of 59.4 gillnet soak hours in the area (Harry et al. 2011a; Yates et al. 2015). Longlines were 800 m long with hooks spaced ~10 m apart, averaging 53 hooks per line (range 29–81), and were set for ~40 minutes, with up to two deployed at once, with a total of 71.2 longline soak hours (Harry et al. 2011a; Yates et al. 2015). All captured sharks were identified, measured, sexed, tagged, with life-stage assessed using length-at-age and anatomical indicators (Harry et al. 2011a; Yates et al. 2015).

Between 2009–2014, a total of 49 Pigeye Sharks ranging in size between 68–173 cm total length (TL) were recorded by fishery observers (n = 8) between 2009–2011 and captured during fishery-independent surveys (n = 41) between 2012–2014 within the area (Harry et al. 2011a; Yates et al. 2015). Neonates (n = 9, 18.3%) ranging in size between 68–87 cm TL, were identified based on size (n = 3), the presence of an open umbilical scar (n = 5), or a partial open umbilical scar (n = 1). Young-of-the-year (YOY; n = 8, 16.3%) ranged in size between 76–80 cm TL. Size-at-birth for the species is ~60–72 cm TL (Ebert et al. 2021) and YOY reach 80 cm TL (Tillett et al. 2011). Neonates and YOY were captured in 2011 (n = 2), 2012 (n = 13), 2013 (n = 1), and 2014 (n = 1). Captures of these life-stages occurred in January–February, June, and August. Among the coastal bays in the Townsville region, except for Cleveland Bay (where survey effort was substantially higher), Repulse Bay encompassed 35% of Pigeye Shark neonates and YOY captured within the ~400 km of coastal bays in the Townsville region.

Blacktip Sharks and Australian Blacktip Sharks are grouped together as they are morphologically similar species that are indistinguishable in the field (Harry et al. 2011a). These two species occur in approximately equal frequencies in northern Australia (Ovenden et al. 2010). Size-at-birth for Australian Blacktip Sharks is 60 cm TL (Ebert et al. 2021) and size for YOY ranges between 60–70 cm TL (Harry et al. 2013). Blacktip Shark size-at-birth is 38–72 cm TL (Ebert et al. 2021) and size for YOY is 83–90 cm TL (Smart et al. 2013). The length-at-age estimates for Australian Blacktip Sharks were used for Blacktip Shark/Australian Blacktip Shark neonates and YOY (<70 cm TL) to ensure that no juvenile sharks were misclassified (the presence of open or partially open umbilical scars were also considered). Between 2011–2014, a total of 209 Blacktip Shark/Australian Blacktip Shark were captured, ranging in size between 54–97 cm TL. These were recorded by fishery observers (n = 158) between 2011–2012 and captured during fishery-independent surveys (n = 51) between 2012–2014 (Harry et al. 2011a; Yates et al. 2015). Neonates and YOY (n = 155, 74.1%) ranging in size between 54.0–73.5 cm TL were identified based on size (n = 154; <70 cm TL), or the presence of a partially open umbilical scar (n = 1; 73.5 cm TL). Neonates and YOY were captured across years in 2011 (n = 114), 2012 (n = 20), 2013 (n = 20), and 2014 (n = 1). Although captures of these life-stages occurred in January, February, May, June, August, and December, 73% of captures occurred in January (Harry et al. 2011a; Yates et al. 2015). Among the coastal bays in the Townsville region across ~400 km of coastline, Cleveland Bay, Repulse Bay, and Rockingham Bay contained the highest abundance of early-life-stage Blacktip Shark/Australian Blacktip Shark (Harry et al. 2011a; Simpfendorfer et al. 2014).

Between 2011–2012, a total of 11 Bull Sharks ranging in size between 68.5–172 cm TL were recorded by fishery observers (n = 4) and captured during fishery-independent surveys (n = 7) in 2012 within the area (Harry et al. 2011a; Yates et al. 2015). Neonates (n = 7, 54.5%) ranging in size between 68.5–79 cm TL, were identified based on size. The size-at-birth for the species is 56–81 cm TL and YOY can be up to 99 cm TL (Pillans et al. 2020; Ebert et al. 2021). Neonates and YOY were captured in January and February in 2011 (n = 3) and 2012 (n = 4) (Harry et al. 2011a). During a different research study conducted between 2022–2025 in the Proserpine River within the area, neonate, YOY, and small juvenile Bull Sharks were regularly observed (Lubitz 2023; N Lubitz unpubl. data 2025). A total of 23 Bull Sharks were captured and released using rod-and-line during four survey days in January 2022, November 2022, February 2024, and January 2025. Up to 12 individuals were captured on a single survey day, demonstrating their high abundance despite low survey effort. Total length was measured and used to determine life-stage. Captured Bull Sharks comprised 13 females and ten males and ranged in size from 68–130 cm TL (N Lubitz unpubl. data 2025). All individuals were either neonates (n = 17), YOY (n = 4), or small juveniles (n = 2). Neonates (74% of total) ranged in size from 68–81 cm TL and YOY (17%) ranged between 82–96 cm TL. The remaining two individuals were small juveniles of 130 cm TL. Small Bull Sharks in eastern Australia remain in river and estuary habitats for up to five years (Werry et al. 2011), highlighting that these juveniles, in addition to the neonates and YOY, are also likely still constrained to this area. The species is also regularly captured by

[redacted]

recreational fishers and observed by river tour guides operating in this area. Combined, this information shows that Repulse Bay-Proserpine River is an important area for early life-stages of Bull Sharks. Although the area is located only ~100 km from Haughton River and 275 km from Pioneer River, which also host important habitat for young Bull Sharks, these river systems are individually important. Bull Sharks in Australia display natal philopatry, with females returning to particular river systems to pup (Tillett et al. 2012; Lubitz 2023). For example, half-sibling pairs were found within a river on Australia's east coast up to seven cohorts apart, highlighting the long-term natal philopatry of females (Lubitz 2023). Therefore, individual rivers in this region represent discrete portions of habitat that are important to Bull Sharks.

A total of 69 Narrow Sawfish ranging in size between 56.5–230.5 cm TL were recorded by fishery observers (n = 18) in 2011 and captured during fishery-independent surveys (n = 51) between 2012–2014 within the area (Harry et al. 2011a; Yates et al. 2015). Neonates (n = 8, 11.5%) ranging in size between 56.5–68.0 cm TL, were identified based on size. Young-of-the-year (n = 51, 73%), ranged in size between 71–149 cm TL. Size-at-birth of the species is 43–70 cm TL (Last et al. 2016) and YOY sizes are estimated at <150 cm TL, based on growth curves (Peverell 2009). Neonates and YOY were captured across years in 2011 (n = 17), 2012 (n = 10), 2013 (n = 26), and 2014 (n = 6). Captures of these life-stages occurred evenly across the months of January, February, May, June, October, and December. Among the coastal bays in the Townsville region across ~400 km of coastline, except for Cleveland Bay (where survey effort was substantially higher), Repulse Bay contained the highest abundance of early-life-stage Narrow Sawfish (Harry et al. 2011a; Simpfendorfer et al. 2014).

Acknowledgments

Adrianna Pisarczyk (James Cook University), Alastair Harry (Department of Primary Industries and Regional Development, Western Australia), Andrew Chin (James Cook University), Peter Yates (Australian Department of Climate Change, Energy, the Environment and Water), Nicolas Lubitz (Biopixel Oceans Foundation; James Cook University), Chris A Rohner (IUCN SSC Shark Specialist Group – ISRA Project), and Marta D Palacios (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.

This factsheet has undergone review by the ISRA Independent Review Panel prior to its publication.

This project was funded by the Shark Conservation Fund, a philanthropic collaborative pooling expertise and resources to meet the threats facing the world's sharks and rays. The Shark Conservation Fund is a project of Rockefeller Philanthropy Advisors.

Suggested citation

IUCN SSC Shark Specialist Group. 2025. Repulse Bay-Proserpine River 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
SHARKS												
Carcharhinus amboinensis	Pigeye Shark	VU	0–60	X		X						
Carcharhinus limbatus	Blacktip Shark	VU	0–140	X		X						
Carcharhinus leucas	Bull Shark	VU	0–256	X		X						
Carcharhinus tilstoni	Australian Blacktip Shark	LC	0–150			X						
RAYS												
Anoxypristis cuspidata	Narrow Sawfish	CR	0–128	X		X						

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Carcharhinus sorrah	Spot-tail Shark	NT
Rhizoprionodon taylori	Australian Sharpnose Shark	LC
Sphyrna lewini	Scalloped Hammerhead	CR
Sphyrna mokarran	Great Hammerhead	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.

SUPPORTING INFORMATION

There are additional indications that Repulse Bay-Proserpine River is a potential reproductive area for one shark species.

Between 2012–2014, a total of eight Great Hammerheads ranging in size between 73–212 cm TL were captured within the area during fishery-independent surveys (Yates et al. 2015; Harry et al. 2011a). Young-of-the-year (n = 4, 50%) ranged in size between 73–80 cm TL, while juveniles (n = 3), ranged between 133–195 cm TL. Size-at-birth for the species is 50–70 cm TL (Ebert et al. 2021) and YOY reach 95 cm TL (Harry et al. 2011b). YOY and juveniles were captured in 2012 (n = 6) and 2014 (n = 1), during February, June, and December. Further information is required to determine the importance of the area for this species.

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