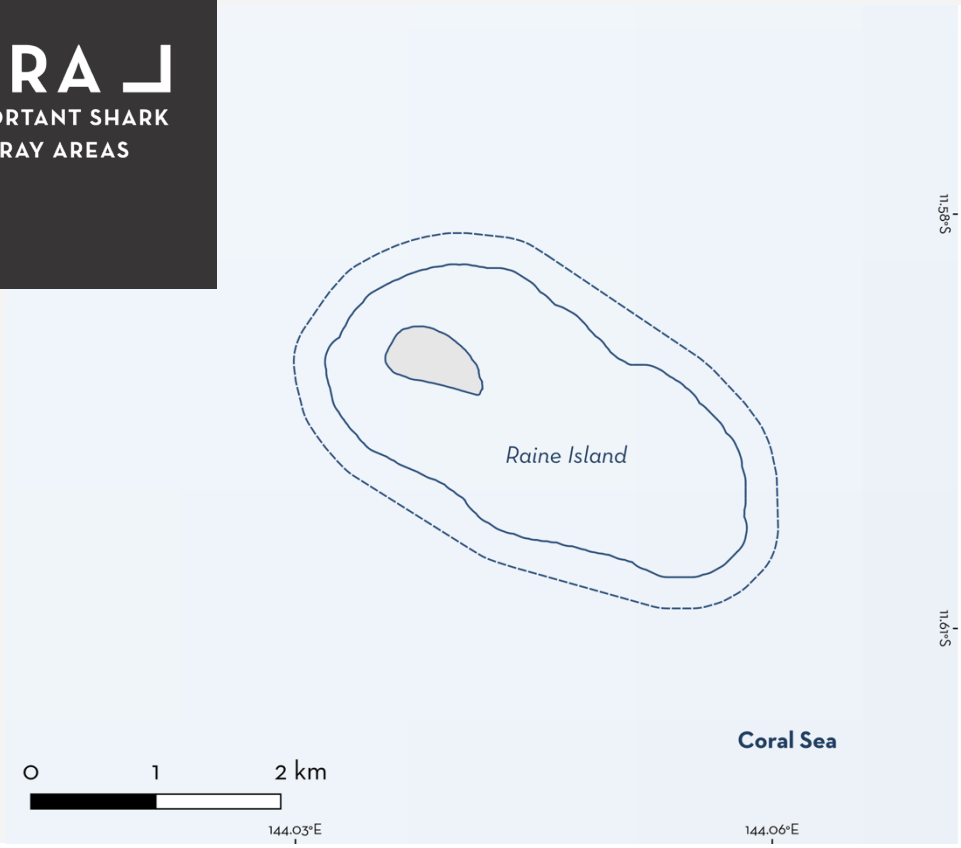
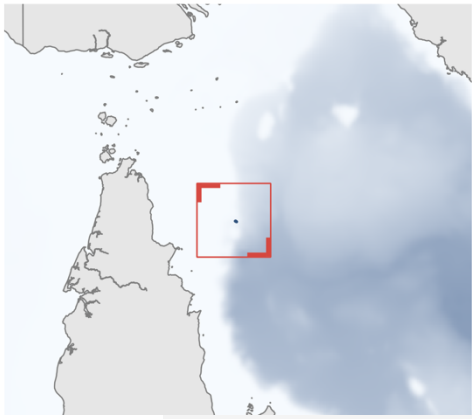
ISRA
IMPORTANT SHARK AND RAY AREAS





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

RAINE ISLAND ISRA

Australia and Southeast Indian Ocean Region

AUSTRALIA

0–300 metres

5.03 km²

SUMMARY

Raine Island is located in far north Queensland, Australia. It is situated ~130 km east of the Australian mainland. It comprises a small, detached reef with a sandy cay on the western side. The habitat is characterised by sandy beaches, a reef flat, rubble, forereef, and an outer reef slope. It is influenced by the North Queensland Current, and by winds and waves coming mainly from the southeast. The area overlaps with the Great Barrier Reef Marine Park and with the Raine Island, Moulter and Maclennan Cays Key Biodiversity Area. Within this area there are: **feeding areas** (Tiger Shark *Galeocerdo cuvier*).

CRITERIA

Sub-criterion C2 – Feeding Areas

DESCRIPTION OF HABITAT

Raine Island is located in far north Queensland, Australia. It is situated ~130 km east of mainland Australia. It is a small, detached reef situated offshore from the Great Barrier Reef. The area comprises an oval patch reef with a shallow reef flat and a small sand cay on the leeward (western) side (Dawson & Smithers 2014). The fringing reef steeply drops to ~200–300 m depth. The habitat is characterised by sandy beaches, a reef flat, rubble, forereef, and an outer reef slope (Dawson & Smithers 2014).

The area is influenced by the North Queensland Current and by wind and waves from the Coral Sea, predominantly coming from north-northeast to south-southeast (Choukroun et al. 2010; Dawson & Smithers 2014). Strong southeasterly winds blow on ~85% of days, particularly between May–November (Dawson & Smithers 2014). Wind direction is more varied during the austral summer from December–March. Deepwater waves break on the windward, eastern side of the reef. The diurnal tidal range is ~1.8 m, and water depth on the reef flat during low tide is ~1.5–2.0 m (Dawson & Smithers 2014).

Raine Island overlaps with the Great Barrier Reef Marine Park – Marine National Park zone (UNEP-WCMC & IUCN 2025) and with the Raine Island, Moulter and Maclennan Cays Key Biodiversity Area (KBA 2025).

The Important Shark and Ray Area is benthic and pelagic and is delineated from surface waters (0 m) to a depth of 300 m based on the bathymetry of the area.

ISRA CRITERIA

SUB-CRITERION C2 – FEEDING AREAS

Raine Island is an important feeding area for one shark species.

Tiger Sharks seasonally feed on Green Turtle *Chelonia mydas* in this area (Fitzpatrick et al. 2012; Hammerschlag et al. 2016; K Robertson pers. comm. 2025). Raine Island has the largest nesting concentration of Green Turtles in the world, with up to 12,000 individuals nesting here each season, peaking from November–April (Limpus et al. 2003). Ten Tiger Sharks and eight Green Turtles were tracked with satellite tags between 2002–2008, and core habitat calculated as the 25% Kernel Density Estimates (Fitzpatrick et al. 2012; Hammerschlag et al. 2016). The tags recorded locations whenever they were at the surface and an ARGOS satellite was overhead. During the nesting season, the entire core habitat of Green Turtles (848 km^2) was inside the core habitat of Tiger Sharks (1,090 km^2), while outside the nesting season there was no overlap at all as turtles migrated to feeding sites in Torres Strait. Tiger Sharks also spent more time at the surface inside the turtle core habitat (average = 3.8 ARGOS messages per day) than outside it (average = 2.9 messages). As the hunting of turtles by Tiger Sharks likely involves sub-surface stalking, the result means that at Raine Island, the sharks likely feed on dead turtles that wash off the island and/or weakened turtles in the surf zone (Hammerschlag et al. 2016). This is consistent with observations of Tiger Shark behaviour in this area (Limpus et al. 2003; K Robertson pers. obs. 2025). Green Turtle mortality depends on the number of nesting individuals but can be up to 2,000 individuals per season (Limpus et al. 2003), highlighting an abundant and easy prey resource for Tiger Sharks. Contemporary observations by scientists from 2015–2024 show that feeding events of Tiger Sharks continue to occur regularly in this area, particularly in November–December (K Robertson pers. comm. 2025).

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Neil Hammerschlag (Atlantic Shark Expeditions; Shark Research Foundation) and Christoph A Rohner (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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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												
Galeocerdo cuvier	Tiger Shark	NT	0–1,275				X					

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Carcharhinus amblyrhynchos	Grey Reef Shark	EN
Hemiscyllium ocellatum	Epaulette Shark	LC
Triaenodon obesus	Whitetip Reef Shark	VU

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.

REFERENCES

Choukroun S, Ridd PV, Brinkman R, McKinna LIW. 2010. On the surface circulation in the western Coral Sea and residence times in the Great Barrier Reef. *Journal of Geophysical Research: Oceans* 115: C06013. https://doi.org/10.1029/2009jc005761

Dawson JL, Smithers SG. 2014. Carbonate sediment production, transport and supply to a coral cay at Raine Reef, northern Great Barrier Reef, Australia: A facies approach. *Journal of Sedimentary Research* 84: 1120–1138. https://doi.org/10.2110/jsr.2014.84

Fitzpatrick R, Thums M, Bell I, Meekan MG, Stevens JD, Barnett A. 2012. A comparison of the seasonal movements of Tiger Sharks and Green Turtles provides Insight into their predator-prey relationship. *PLoS ONE* 7: e51927. https://doi.org/10.1371/journal.pone.0051927

Hammerschlag N, Bell I, Fitzpatrick R, Gallagher AJ, Hawkes LA, Meekan MG, Stevens JD, Thums M, Witt MJ, Barnett A. 2016. Behavioral evidence suggests facultative scavenging by a marine apex predator during a food pulse. *Behavioral Ecology and Sociobiology* 70: 1777–1788. https://doi.org/10.1007/s00265-016-2183-2

Key Biodiversity Areas (KBA). 2025. Key Biodiversity Areas factsheet: Raine Island, Moulter and Maclennan Cays. Available at: https://www.keybiodiversityareas.org/site/factsheet/23971 Accessed September 2025.

Limpus CJ, Miller JD, Parmenter CJ, Limpus DJ. 2003. The green turtle *Chelonia mydas*, population of Raine Island and the northern Great Barrier Reef. *Memoirs of the Queensland Museum* 49: 349–440.

UNEP-WCMC & IUCN. 2025. Protected Planet: The World Database on Protected Areas (WDPA) and World Database on Other Effective Area-based Conservation Measures (WD-OECM) [Online], September 2025, Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net Accessed September 2025.