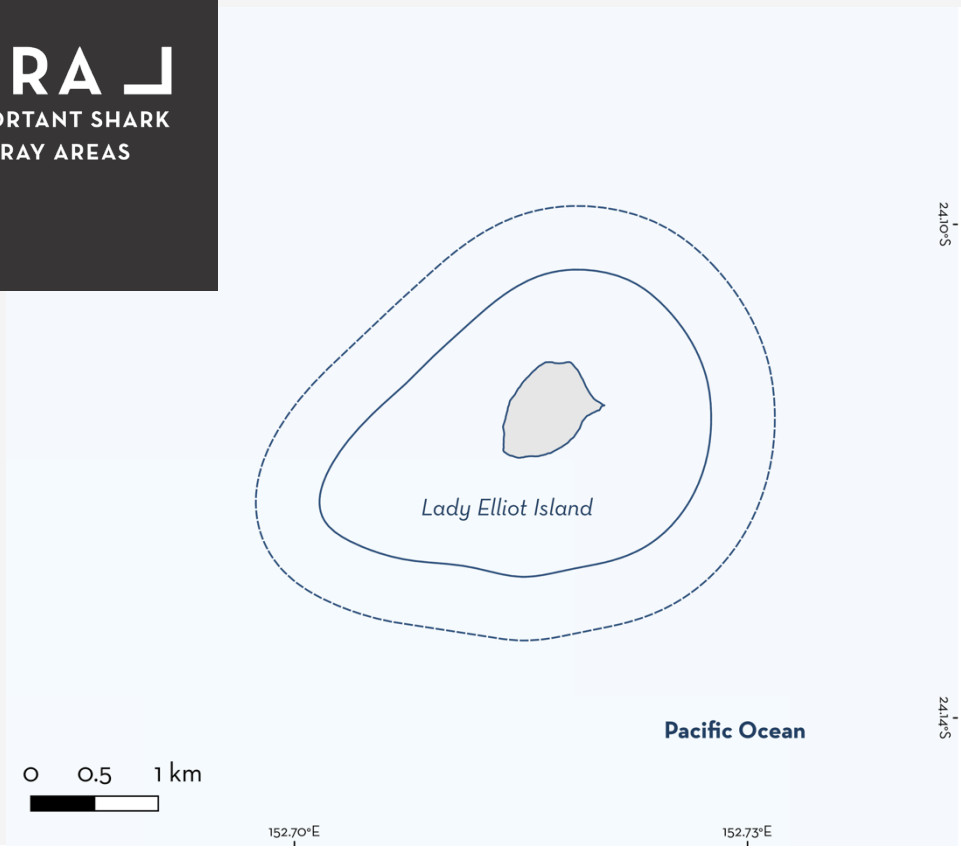
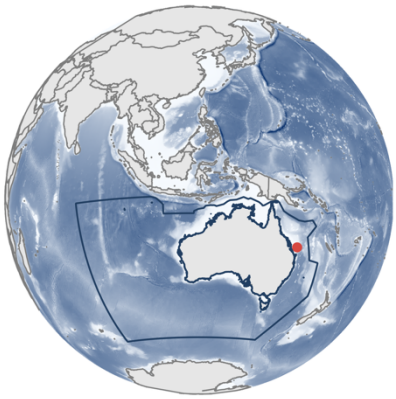
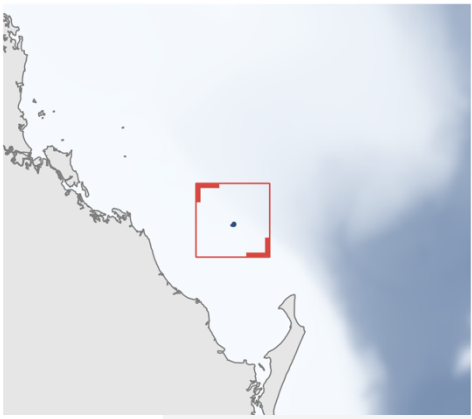
ISRA
IMPORTANT SHARK AND RAY AREAS







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

LADY ELLIOT ISLAND ISRA

Australia and Southeast Indian Ocean Region

AUSTRALIA

0–30 metres

4.89 km²

SUMMARY

Lady Elliot Island is located in Queensland, Australia. The area surrounds a small coral cay island at the southern end of the Great Barrier Reef with a large reef flat and lagoon on its eastern side. On its western side, a narrow reef flat leads to scattered coral bommies. The area is influenced by the East Australian Current and the mesoscale oceanographic feature of the Capricorn Eddy bringing cooler, nutrient-enriched waters onto the shelf. It overlaps with the Capricornia Cays Key Biodiversity Area and the Great Barrier Reef Marine Park. Within the area there are: **threatened species** (e.g., Silvertip Shark *Carcharhinus albimarginatus*); **range-restricted species** (Epaulette Shark *Hemiscyllium ocellatum*); **reproductive areas** (Reef Manta Ray *Mobula alfredi*); **feeding areas** (Reef Manta Ray); and **undefined aggregations** (e.g., Spotted Eagle Ray *Aetobatus ocellatus*).

CRITERIA

Criterion A – Vulnerability; Criterion B – Range Restricted;
Sub-criterion C1 – Reproductive Areas; Sub-criterion C2 – Feeding Areas;
Sub-criterion C5 – Undefined Aggregations

DESCRIPTION OF HABITAT

Lady Elliot Island is located in Queensland, Australia. The area surrounds a small coral cay island at the southern end of the Great Barrier Reef with a large reef flat and lagoon on its eastern side, and a narrow reef flat on its western side leading to scattered coral bommies (AO Armstrong pers. obs. 2025). The habitat is characterised by hard and soft coral cover, and sandy substrates. The island itself is situated on the leeward (western) side of the main reef flat and is frequented by up to 50,000 breeding pairs of seabirds per year, resulting in high nutrient loads in the groundwater and potentially entering the surrounding reef waters (Erler et al. 2024).

The area is influenced by the East Australian Current, the poleward flowing western boundary current of the South Pacific Gyre (Suthers et al. 2011). The East Australian Current flow is strongest in the austral summer, and the formation of eddies along this coastline also fluctuates seasonally (Ridgway & Hill 2009). Lady Elliot Island is located in close proximity (~7 km) to the continental shelf and the mesoscale oceanographic feature of the Capricorn Eddy (Weeks et al. 2015). The Capricorn Eddy can trigger upwelling of cooler, nutrient-enriched waters onto the shelf and transport these waters to the reef zone.

The area overlaps with the Capricornia Cays 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 30 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A – VULNERABILITY

Three Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occur in the area. These are the Endangered Spotted Eagle Ray (Finucci et al. 2024); and the Vulnerable Silvertip Shark (Rigby et al. 2024) and Reef Manta Ray (Marshall et al. 2022).

CRITERION B – RANGE RESTRICTED

This area holds the regular presence of Epaulette Sharks as a resident range-restricted species. This species occurs year-round in the area and is regularly encountered on the reef flat (AO Armstrong, J Blackmore, & CL Dudgeon pers. obs. 2025). Observations of this species are most common during reef walks at low-tide, between sunset and sunrise when the species is most active, with foraging behaviour and egg cases also observed (AO Armstrong, J Blackmore, & CL Dudgeon pers. obs. 2025). On average four sharks can be encountered during a 60-minute reef walk, with Epaulette Sharks observed on every reef walk, weather dependent. This area sits at the southern end of the species' range, and is relatively isolated, with available habitat patchy and disconnected (CL Dudgeon pers. obs. 2025). Due to the area's isolated location as a coral cay at the southern end of the Great Barrier Reef, and the availability of the species' preferred habitat of shallow reef flat, this area provides important habitat for this range-restricted species comparative to the broader region. This species occurs primarily in the East Central Australian Shelf Large Marine Ecosystem (LME) and only marginally into the Northeast Australian Shelf LME.

SUB-CRITERION C1 – REPRODUCTIVE AREAS

Lady Elliot Island is an important reproductive area for one ray species.

Between 1980–2025, over 1,700 Reef Manta Rays were identified on the east coast of Australia using photo-identification from sightings from citizen science and researcher surveys. A total of 1,147 of these individuals (67.5%) were sighted at Lady Elliot Island (Project Manta unpubl. data 2025). This was based on 7,007 encounters (69.8% of the sightings along the entire east coast of Australia; n = 10,038). Almost all sightings have been since 2007 when dedicated research surveys began around the island (99.6%; n = 6,979; Project Manta unpubl. data 2025). Reef Manta Rays are sighted at Lady Elliot Island year-round with a seasonal peak of sightings falling between May–October (Project Manta unpubl. data 2025). Observed behaviour was recorded for 2,195 sightings (31.3%). Of these, there were 159 observations of courtship (7%), 59 observations of mating scars on the pectoral fins (2.7%), and 230 instances of pregnancy reported based on visibly distended abdomens (Project Manta unpubl. data 2025). Four neonates were also recorded in the area (n = 1 in 2020, n = 1 in 2022, and n = 2 in 2025), assessed based on their size (<150 cm disc width; DW) and observations of false umbilical scars or wing creases (both signs of recent birth; Project Manta unpubl. data 2025). Size-at-birth for Reef Manta Rays is 130–150 cm DW (Last et al. 2016). Investigations into the population dynamics of Reef Manta Rays around the island found that there was a significant bias towards females in the sex ratio (1.2:1 female-to-male ratio; $p < 0.05$; proportion female = 0.56, 95% CI = 0.52–0.59), with females more commonly resighted than males (Couturier et al. 2014), adding support to the importance of this area for the reproduction of this species.

SUB-CRITERION C2 – FEEDING AREAS

Lady Elliot Island is an important feeding area for one ray species.

Between 1980–2025, over 1,700 Reef Manta Rays were identified on the east coast of Australia using photo-identification from sightings from citizen science and researcher surveys. A total of 1,147 of these individuals (67.5%) were sighted at Lady Elliot Island (Project Manta unpubl. data 2025). This was based on 7,007 encounters (69.8% of the sightings along the entire east coast of Australia; n = 10,038). Almost all sightings have been since 2007 when dedicated research surveys began around the island (99.6%; n = 6,979; Project Manta unpubl. data 2025). Reef Manta Rays are sighted at Lady Elliot Island year-round with a seasonal peak of sightings falling between May–October (Project Manta unpubl. data 2025). Observed behaviour was recorded for 2,195 sightings (31.3%). Of these, there were 333 observations of feeding behaviour (Project Manta unpubl. data 2025), defined as swimming at the surface with an open mouth and cephalic lobes forming a funnel to aid prey capture (AO Armstrong unpubl. data 2025). In addition, in-situ analysis of the prey environment for Reef Manta Rays in the area found their food is dominated by copepod crustaceans, and foraging activity is related to the density of zooplankton in the water (Armstrong et al. 2016). The largest feeding aggregation observed off the island was in 2013 when a combination of oceanographic and weather events resulted in 150+ Reef Manta Rays observed feeding in proximity to the island (Weeks et al. 2015). However, regular feeding aggregations of 10+ Reef Manta Rays are observed off the south-western side of the island when the wind and currents concentrate the zooplankton in this part of the area (AO Armstrong pers. obs. 2025). Further, an investigation into Reef Manta Ray sightings using a logbook of records from around the island identified three main observed behaviours: cruising, cleaning, and feeding (Jaine et al. 2012). It was found that the peak in feeding observations was earlier in the season and preceded the peak in the other behaviours that followed in later months, suggesting the aggregation at this site is driven by food availability in the first instance. Reef Manta Rays are known to attend cleaning stations in proximity to feeding areas (Armstrong et al.

2021). From the sightings in the area where the observed behaviour was recorded (n = 2,195 sightings; 31.3%), 1,684 were of cleaning (76.7%; Project Manta unpubl. data 2025), demonstrating that this area provides habitat for multiple uses for this species.

SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Lady Elliot Island is an important area for undefined aggregations of one shark and one ray species.

Between 2016–2023, monthly snorkel tours were conducted on the eastern side of the island, within the area (J Blackmore pers. obs. 2025). Observations are anecdotal, with no formal records maintained. Silvertip Sharks were observed year-round on almost all tours to this part of the area. Individual Silvertip Sharks comprised the most common observations, however, aggregations of up to four sharks are observed on a single 60-minute tour. Most sharks are seen cruising beyond the reef edge (J Blackmore pers. obs. 2025). Between 2020–2025, dedicated research trips were conducted three times a year in the area (February, June, October; CL Dudgeon & AO Armstrong pers. obs. 2025). During these fieldtrips, twice daily 60-minute SCUBA dives were conducted over an average seven-day duration (~42 dives per year). Silvertip Sharks were observed year-round on the eastern side of the island, within the area. Survey effort in this part of the area is weather dependent, with only ~10% of dives conducted on the eastern side of the area. On average, ~2 Silvertip Sharks are observed on a single dive (range 1–4 sharks), with at least one individual observed on every dive (CL Dudgeon & AO Armstrong unpubl. data 2025). However, 3–4 individuals were seen regularly and there are occasional citizen science reports of larger aggregations up to 100 Silvertip Sharks (I Christie & O Richardson pers. comm. 2025). The majority of sightings (~90%) are of sharks cruising along the reef edge, but cleaning was also regularly observed at a dive site called Hiro's Cave (CL Dudgeon & AO Armstrong unpubl. data 2025). When cleaning, Silvertip Sharks are observed to swim with their pectoral fins splayed and their mouth open in an almost vertical manner across a coral reef outcrop, while cleaner wrasse clean them (AO Armstrong pers. obs. 2025). More information is needed to confirm the nature and function of these aggregations.

Between 2016–2023, daily snorkel tours were conducted in the area (J Blackmore pers. obs. 2025). Observations are anecdotal, with no formal records maintained. Spotted Eagle Rays were observed year-round on almost all tours. On average aggregations of five Spotted Eagle Rays are observed on a single 60-minute tour (range 1–50 rays). Most rays are seen cruising in small groups, and courtship behaviour has been observed on occasion (J Blackmore pers. obs. 2025). Between 2020–2025, dedicated research trips were conducted three times a year in the area (February, June, October; CL Dudgeon & AO Armstrong pers. obs. 2025). During these fieldtrips, twice daily 60-minute SCUBA dives were conducted over an average seven-day duration (~42 dives per year). Observations are anecdotal, with no formal records maintained. Spotted Eagle Rays were observed year-round in the area. On average, ~3 Spotted Eagle Rays are observed on a single dive (range 1–30+ rays) (CL Dudgeon & AO Armstrong unpubl. data 2025). However, there have been at least two citizen science reports of larger aggregations of 100+ Spotted Eagle Rays in 2019 and 2025 (J Somerville & B Young pers. comm. 2025). The majority of sightings (~90%) are of rays cruising in small groups, but individuals are also regularly observed cleaning, and pregnancy and courtship have also been recorded (CL Dudgeon & AO Armstrong unpubl. data 2025). In addition to these observations, there are 26 records of Spotted Eagle Rays from within the area on iNaturalist, including two records of aggregations (n = 4 individuals in 2017 and n = 13 individuals in 2024; iNaturalist 2025). The next available records of this species from iNaturalist are almost 100 km north of this area, highlighting its importance. However, more information is needed to confirm the nature and function of these aggregations.

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Jessica Blackmore (Lady Elliot Island Eco Resort), Christine L Dudgeon (University of the Sunshine Coast), and Asia O Armstrong (Project Manta; 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												
Carcharhinus albimarginatus	Silvertip Shark	VU	0–800	X						X		
Hemiscyllium ocellatum	Epaulette Shark	LC	0–50		X							
RAYS												
Aetobatus ocellatus	Spotted Eagle Ray	EN	0–40	X						X		
Mobula alfredi	Reef Manta Ray	VU	0–711	X		X	X					

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Carcharhinus amblyrhynchos	Grey Reef Shark	EN
Carcharhinus limbatus	Blacktip Shark	VU
Carcharhinus melanopterus	Blacktip Reef Shark	VU
Eucrossorhinus dasypogon	Tasselled Wobbegong	LC
Galeocerdo cuvier	Tiger Shark	NT
Nebrius ferrugineus	Tawny Nurse Shark	VU
Sphyrna mokarran	Great Hammerhead	CR
Stegostoma tigrinum	Indo-Pacific Leopard Shark	EN
Triaenodon obesus	Whitetip Reef Shark	VU
RAYS		
Aetomylaeus vespertilio	Ornate Eagle Ray	CR
Bathytoshia lata	Brown Stingray	VU
Himantura australis	Australian Whipray	LC
Megatrygon microps	Smalleye Stingray	DD
Mobula eregoodoo	Longhorned Pygmy Devil Ray	EN
Mobula mobular	Spinetail Devil Ray	CR
Pastinachus ater	Broad Cowtail Ray	VU
Pateobatis fai	Pink Whipray	EN
Rhina anclyostoma	Bowmouth Guitarfish	CR
Rhynchobatus australiae	Bottlenose Wedgefish	CR
Taeniura lymma	Bluespotted Lagoon Ray	LC
Taeniurops meyeni	Blotched Fantail Ray	VU
Urogymnus asperrimus	Porcupine Ray	EN

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 this area may be important for three ray species.

Between 2017–2025, sightings from citizen science and staff surveys of Ornate Eagle Rays were collected in a photo-identification database in the area (J Blackmore et al. unpubl. data 2025). There were 111 encounters, with 78.4% of sightings (n = 87) falling between December–April (J Blackmore et al. unpubl. data 2025). This species is very rare globally and this is the only known location in Australia where reliable sightings of this species occur. On rare occasions, more than one individual has been observed, and a late-stage pregnancy has also been observed with the pup moving inside the female's abdomen (B Andryc pers. comm. 2025).

Between 2020–2024, opportunistic sightings of Smalleye Stingrays from citizen scientists were collected in the area (J Blackmore & AO Armstrong unpubl. data 2025). There have been at least 17 encounters, with 88.2% of sightings (n = 15) falling between June–September (J Blackmore & AO Armstrong unpubl. data 2025). This species is frequently observed in assemblages with Pink Whiprays and occasionally observed at cleaning stations in the area. This species is rare globally and this is the only known location in Australian waters where regular sightings occur.

Between 2016–2023, daily snorkel tours were conducted in the area (J Blackmore pers. obs. 2025). Broad Cowtail Rays were observed on almost all tours year-round, peaking during winter. On average ~3 Broad Cowtail Rays are observed on a single 60-minute tour (range 1–15 rays). In addition, between 2020–2025, dedicated research trips were conducted three times a year in the area (February, June, October; CL Dudgeon & AO Armstrong pers. obs. 2025). During these fieldtrips, twice daily 60-minute SCUBA dives were conducted over an average seven-day duration (~42 dives per year). Broad Cowtail Rays were observed year-round, peaking during winter. On average, two Broad Cowtail Rays are observed on a single dive (range 1–9 rays), however, during June surveys the average increased (CL Dudgeon & AO Armstrong unpubl. data 2025). The majority of sightings (~99%) were of rays resting on the sand between reef structures, with occasional observations of foraging activity and attendance at cleaning stations. During June surveys, pregnant females are also observed, suggesting this aggregation may be multi-purpose (CL Dudgeon & AO Armstrong unpubl. data 2025).

REFERENCES

Armstrong AO, Armstrong AJ, Jaine FRA, Couturier LIE, Fiora K, Uribe-Palomino J, Weeks SJ, Townsend KA, Bennett MB, Richardson AJ. 2016. Prey density threshold and tidal influence on reef manta ray foraging at an aggregation site on the Great Barrier Reef. *PLoS ONE* 11: e0153393. https://doi.org/10.1371/journal.pone.0153393

Armstrong AO, Armstrong AJ, Bennett MB, Richardson AJ, Townsend KA, Everett JD, Hays GC, Pederson H, Dudgeon CL. 2021. Mutualism promotes site selection in a large marine planktivore. *Ecology and Evolution* 11: 5606–5623. https://doi.org/10.1002/ece3.7464

Couturier LIE, Dudgeon CL, Pollock KH, Jaine FRA, Bennett MB, Townsend KA, Weeks SJ, Richardson AJ. 2014. Population dynamics of the reef manta ray *Manta alfredi* in eastern Australia. *Coral Reefs* 33: 329–342. https://doi.org/10.1007/s00338-014-1126-5

Erler DV, Dudgeon CL, Armstrong AO, Banks EW, Ramirez-Valle O, Gutiérrez-Jurado HA, Gilby BL, Townsend KA. 2024. Linking transpiration to reef nitrogen supply on a tropical coral island. *Journal of Geophysical Research: Biogeosciences* 129: e2023JG007413. https://doi.org/10.1029/2023JG007413

Finucci B, Rigby CL, Armstrong AO, Rezaie-Atagholipour M. 2024. *Aetobatus ocellatus. The IUCN Red List of Threatened Species* 2024: e.T42566169A124549514. https://dx.doi.org/10.2305/IUCN.UK.2024-1.RLTS.T42566169A124549514.en

iNaturalist 2025. iNaturalist. Available at: https://www.inaturalist.org/ Accessed October 2025.

Jaine FRA, Couturier LIE, Weeks SJ, Townsend KA, Bennett MB, et al. 2012. When giants turn up: Sighting trends, environmental influences and habitat use of the manta ray *Manta alfredi* at a coral reef. *PLoS ONE* 7: e46170. https://doi.org/10.1371/journal.pone.0046170

Key Biodiversity Areas (KBA). 2025. Key Biodiversity Areas factsheet: Capricornia Cays. Available at: https://www.keybiodiversityareas.org/site/factsheet/23967 Accessed September 2025.

Last PR, White WT, de Carvalho MR, Séret B, Stehmann MFW, Naylor GJP. 2016. *Rays of the world.* Clayton South: CSIRO Publishing.

Marshall A, Barreto R, Carlson J, Fernando D, Fordham S, Francis MP, Herman K, Jabado RW, Liu KM, Pacoureau N, et al. 2022. *Mobula alfredi* (amended version of 2019 assessment). *The IUCN Red List of Threatened Species* 2022: e.T195459A214395983. https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T195459A214395983.en

Ridgway K, Hill K. 2009. The East Australian Current. In: Poloczanska, ES, Hobday AJ, Richardson AJ. eds. *A marine climate change impacts and adaptation report card for Australia 2009.* Hobart: NCCARF Publication, CSIRO, 1–16.

Rigby CL, Charles R, Espinoza M, Finucci B, Jabado RW, Simpfendorfer C, Simeon B. 2024. *Carcharhinus albimarginatus. The IUCN Red List of Threatened Species* 2024: e.T161526A124499982. https://dx.doi.org/10.2305/IUCN.UK.2024-1.RLTS.T161526A124499982.en

Suthers IM, Young JW, Baird ME, Roughan M, Everett JD, Brassington GB, Byrne M, Condie SA, Hartog JR, Hassler CS, et al. 2011. The strengthening East Australian Current, its eddies and biological effects—an introduction and overview. *Deep Sea Research Part II: Topical Studies in Oceanography* 58: 538–546. https://doi.org/10.1016/j.dsr2.2010.09.029

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.

Weeks SJ, Magno-Canto MM, Jaine FRA, Brodie J, Richardson AJ. 2015. Unique sequence of events triggers manta ray feeding frenzy in the southern Great Barrier Reef, Australia. *Remote Sensing* 7: 3138–3152. https://doi.org/10.3390/rs70303138