

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

## NORTHWEST WAIGEO ISRA

### Asia Region

### SUMMARY

Northwest Waigeo is located in West Papua, Indonesia. The area is part of the Raja Ampat archipelago and includes several bays and islands, and has an extended shelf characterised by the presence of coral reefs, mangroves, and seagrass beds. The area overlaps with one Ecologically or Biologically Significant Marine Area, one Key Biodiversity Area, and with three marine protected areas. Within this area there are: **threatened species** (e.g., Giant Guitarfish *Glaucostegus typus*); **range-restricted species** (e.g., Raja Ampat Epaulette Shark *Hemiscyllium freycineti*); **reproductive areas** (e.g., Blacktip Reef Shark *Carcharhinus melanopterus*); **feeding areas** (Reef Manta Ray *Mobula alfredi*); **undefined aggregations** (e.g., Oceanic Manta Ray *Mobula birostris*); and the area sustains a **high diversity of sharks** (33 species).

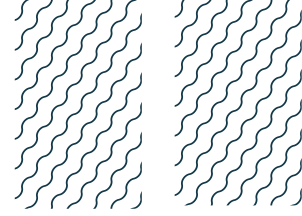
### CRITERIA

— —  
**INDONESIA**

— —  
**0-100 metres**

— —  
**2,394 km<sup>2</sup>**

— —



**Criterion A - Vulnerability; Criterion B - Range Restricted;  
Sub-criterion C1 - Reproductive Areas; Sub-criterion C2 - Feeding Areas;  
Sub-criterion C5 - Undefined Aggregations; Sub-criterion D2 - Diversity**

## DESCRIPTION OF HABITAT

Northwest Waigeo is located in West Papua, Indonesia. The area is part of the Raja Ampat archipelago and sits within the Bird's Head Seascape (Allen & Erdmann 2009). The area includes several bays and islands, with Sayang, Wayag, Kawe, and the western side of Waigeo being the largest. This area has an extended shelf characterised by the presence of coral reefs, mangroves, and seagrass beds.

The area is mainly influenced by monsoon seasons. The northwest monsoon, occurring from November to April, is characterised by warm sea surface temperatures. In contrast, the southeast monsoon (May to October) is characterised by strong and continuous southeast winds that produce upwellings, resulting in an increase in primary productivity in coastal areas (Mangubhai et al. 2012).

The area overlaps with the Raja Ampat and Northern Bird's Head Ecologically or Biologically Significant Marine Area (EBSA; CBD 2024), and the Waigeo Barat Key Biodiversity Area (KBA 2024). In addition, it overlaps with three marine protected areas: KKPN Kepulauan Waigeo Sebelah Barat Marine Nature Reserve, KKPN Kepulauan Raja Ampat Marine Nature Reserve, and Pulau Sayang Wildlife Sanctuary.

This Important Shark and Ray Area is benthic and pelagic and is delineated from inshore and surface waters (0 m) to 100 m based on the bathymetry of the area.

## ISRA CRITERIA

### CRITERION A - VULNERABILITY

Thirty Qualifying species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occur in the area. Threatened sharks comprise two Critically Endangered species, four Endangered species, and nine Vulnerable species; threatened rays comprise three Critically Endangered species, six Endangered species, and six Vulnerable species (IUCN 2024).

### CRITERION B - RANGE RESTRICTED

Northwest Waigeo holds the regular presence of the Spotted-belly Catshark, Raja Ampat Epaulette Shark, and Indonesian Wobbegong as resident range-restricted species. These species occur year-round in the area and even if they are rare species, are regularly encountered by divers, although Spotted-Belly Catshark and the Indonesian Wobbegong are significantly less common (M Erdmann pers. obs. 2020).

Spotted-belly Catshark has been regularly reported in the area between 2016–2023 based on underwater visual census and is found on shallow reefs in Northwest Waigeo. From five night dives done in the past eight years, it was observed in three dives (M Erdmann unpubl. data 2020).

Raja Ampat Epaulette Shark has been reported continuously in the area since 2007 from diving observations, with many individuals sampled for taxonomic studies (Allen et al. 2016; Dudgeon et al. 2020; MV Erdmann unpubl. data. 2023). This species is found predominantly on shallow reef flats with seagrass beds and scattered coral bommies, though it is also found in mangroves and on coral reefs from 0 to 20 m depth (Allen et al. 2016). Though the species is found throughout Raja Ampat, Northwest Waigeo is a secondary center of abundance (behind Dampier Strait) due to the extensive and well-developed reef flats throughout the area (M Erdmann pers. obs. 2023).

Indonesian Wobbegong has been regularly reported in the area between 2004–2021 based on landing monitoring and underwater visual census and is found on reefs at depths of 0–100 m and prefers reefs exposed to cold water upwellings (M Erdmann unpubl data 2024). It was observed once live on the Wayag outer reef slope in 2015 and was recorded three times in different years captured by illegal shark finners operating in the area; one of these shark finning boats was observed with 6 individuals on board (M Erdmann pers. obs. 2004–2021).

These three species are restricted to the Indonesian Seas Large Marine Ecosystem (LME).

## SUB-CRITERION C1 – REPRODUCTIVE AREAS

Northwest Waigeo is an important reproductive area for two sharks and one ray species.

Since 2002, on every seasonal visit to Wayag Lagoon (between 2–10 visits per year), at least 15 neonate and juvenile Blacktip Reef Sharks (based on their body size) have been observed on the shallow reef flats, sand flats and mangroves (M Erdmann unpubl. data 2024). Individuals are commonly <50 cm total length (TL) which is close to the known size-at-birth for the species (Ebert et al. 2021). Between 2013–2021, from 26 surveys focused on Reef Manta Rays in the Wayag Lagoon (Setyawan et al 2020), between 20–40 neonate and juvenile Blacktip Reef Sharks were observed (M Erdmann unpubl. data 2024). In addition, full-time Wayag patrol members reports that neonate and juvenile individuals have been observed on a daily basis on the reef flat in front of the Wayag patrol post since it was opened in 2007 (H Dimalouw pers. comm. 2024).

Mating for the Raja Ampat Epaulette Shark has been observed in Aljui Bay and the Wayag Lagoon eight times since 2015 during surveys and diving operations on the shallow reef flats (M Erdmann unpubl data 2023). In addition, neonates (15–18 cm TL) and juveniles (18–40 cm TL; Vanderwright et

al. 2022) have been observed in all of the 19 nocturnal dives conducted in Aljui Bay or Wayag Lagoon since 2015 (M Erdmann unpubl. data 2024).

Long-term monitoring of the Reef Manta Ray population in Northwest Waigeo recorded 17 pregnant females from 2004 to 2019 based on the presence of extended abdomens (Setyawan et al. 2020, 2022). Courtship has also been observed in Eagle Rock, exclusively in September and October (Setyawan et al. 2020). In addition, Wayag Lagoon has been confirmed as a nursery area for Reef Manta Rays based on the regular presence of neonates and young-of-the-year (YOY) individuals (Setyawan et al. 2018, 2020, 2022). YOY were defined as individuals <200 cm disc width (DW) as previously reported for other sites in Indonesia (Germanov et al. 2019). The known size-at-birth for this species is 130–150 cm DW (Last et al. 2016). Between 2013–2021, 18 YOY were identified in the area based on photo-identification with 16 other juveniles (21–24 cm DW) also identified (Setyawan et al. 2020, 2022). In this period, between 2–15 YOY and juveniles were observed on every survey (n = 26) done in the area and on every month, with an estimation that over 50 YOY may have been observed (Setyawan et al. 2020). YOY represented 47% of the total number of individuals identified and combined with juveniles, represented 95% of all individuals recorded in this area (Setyawan et al. 2020). Five of the Reef Manta Rays were re-sighted for at least 486 days (~1.3 years), including two juveniles re-sighted after 641 and 649 days (~1.7 years) of the first observation. Five juveniles were tracked with satellite transmitters for 12–69 days (in 2015 and 2017, and nine juveniles were tracked with acoustic transmitters for 69–439 days from May 2019 to September 2021). Both methods revealed a high residency within the lagoon with no acoustic detections recorded outside (Setyawan et al 2022; Setyawan 2023).

## SUB-CRITERION C2 - FEEDING AREAS

Northwest Waigeo is an important reproductive area for one ray species.

Aggregations of Reef Manta Rays (up to 30 individuals) that occur regularly in Northwest Waigeo are frequently observed feeding on the surface (Setyawan et al. 2020), especially between December and March. The main sites where this behaviour is observed are Eagle Rock, Yefnabi Kecil, and various spots in Wayag Lagoon (Setyawan et al. unpubl. data 2024). This seasonality is related to upwelling events produced by seasonal monsoons that increase primary productivity in the waters of the Raja Ampat region (Setyawan et al. 2020).

## SUB-CRITERION C5 - UNDEFINED AGGREGATIONS

Northwest Waigeo is an important area for undefined aggregations of two ray species.

Regular monitoring between 2011 and 2022 in Northwest Waigeo revealed that this area hosts six cleaning stations for Reef Manta Rays in Wayag Lagoon, Eagle Rock, and Yefnabi Kecil (Setyawan et al. 2020; Setyawan 2023; E Setyawan pers. obs. 2023). Juveniles use cleaning stations in Wayag Lagoon while the other sites are used mainly by adults (5–15 individuals) and are regularly observed

between October to May.

Aggregations of Shorthorned Pygmy Devil Ray have been observed +40 times since 2008 in the entrance of Wayag Lagoon during the southeast monsoon (July and October). The size of aggregations ranged from 5-50 individuals and are observed on two of every three dives in the area (M Erdmann pers. obs. 2008-2023; M Izuan pers. comm. 2023). This is the only area in all Raja Ampat where these aggregations are regularly observed. More information is needed to confirm the nature of these aggregations.

## SUB-CRITERION D2 - DIVERSITY

Northwest Waigeo sustains a high diversity of Qualifying species (33 species). This exceeds the regional diversity threshold (31 species) for the Asia Region. The regular presence of Qualifying Species has been documented by frequent observations in diving operations and visual census by scientists, through “citizen science”, and through periodic surveys of the catches of tuna fisheries operating in the northern part of the area (Allen & Erdmann 2009, 2024; Erdmann et al. unpubl. data 2002-2024).

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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	
<b>SHARKS</b>													
<i>Alopias pelagicus</i>	Pelagic Thresher Shark	EN	0-584	X									
<i>Atelomycterus erdmanni</i>	Spotted-belly Catshark	LC	0-62		X								
<i>Carcharhinus albimarginatus</i>	Silvertip Shark	VU	0-800	X									
<i>Carcharhinus amblyrhynchos</i>	Grey Reef Shark	EN	0-280	X									
<i>Carcharhinus amboinensis</i>	Pigeye Shark	VU	0-60	X									
<i>Carcharhinus falciformis</i>	Silky Shark	VU	0-1,112	X									
<i>Carcharhinus leucas</i>	Bull Shark	VU	0-256	X									
<i>Carcharhinus limbatus</i>	Blacktip Shark	VU	0-140	X									
<i>Carcharhinus melanopterus</i>	Blacktip Reef Shark	VU	0-75	X		X							
<i>Hemipristis elongata</i>	Snaggletooth Shark	VU	0-130	X									



<i>Hemiscyllium freycineti</i>	Raja Ampat Epaulette Shark	NT	0-30		X	X							
<i>Nebrius ferrugineus</i>	Tawny Nurse Shark	VU	0-70	X									
<i>Orectolobus leptolineatus</i>	Indonesian Wobbegong	NT	0-100		X								
<i>Rhincodon typus</i>	Whale Shark	EN	0-1,928	X									
<i>Sphyrna lewini</i>	Scalloped Hammerhead	CR	0-1,043	X									
<i>Sphyrna mokarran</i>	Great Hammerhead	CR	0-300	X									
<i>Stegostoma tigrinum</i>	Zebra Shark	EN	0-62	X									
<i>Triaenodon obesus</i>	Whitetip Reef Shark	VU	0-330	X									
<b>RAYS</b>													
<i>Aetobatus ocellatus</i>	Spotted Eagle Ray	VU	0-60	X									
<i>Aetomylaeus vespertilio</i>	Ornate Eagle Ray	CR	0-110	X									
<i>Glaucostegus typus</i>	Giant Guitarfish	CR	0-100	X									
<i>Himantura uarnak</i>	Honeycomb Stingray	EN	0-50	X									
<i>Mobula alfredi</i>	Reef Manta Ray	VU	0-672	X		X	X				X		
<i>Mobula birostris</i>	Oceanic Manta Ray	EN	0-1,400	X									

<i>Mobula kuhlii</i>	Shorthorned Pygmy Devil Ray	EN	0-50	X						X		
<i>Pastinachus ater</i>	Broad Cowtail Ray	VU	0-60	X								
<i>Pateobatis fai</i>	Pink Whipray	VU	0-200	X								
<i>Pateobatis jenkinsi</i>	Jenkins' Whipray	VU	0-90	X								
<i>Rhinoptera javanica</i>	Javan Cownose Ray	EN	0-50	X								
<i>Rhynchobatus australiae</i>	Bottlenose Wedgefish	CR	0-60	X								
<i>Taeniurops meyeri</i>	Blotched Fantail Ray	VU	0-439	X								
<i>Urogymnus asperrimus</i>	Porcupine Ray	EN	1-30	X								
<i>Urogymnus granulatus</i>	Mangrove Whipray	EN	0-85	X								

## SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
<b>SHARKS</b>		
<i>Carcharinus sorrah</i>	Spottail Shark	NT
<i>Chiloscyllium punctatum</i>	Brownbanded bambooshark	NT
<i>Eucrossorhinus dasypogon</i>	Tasselled Wobbegong	LC
<i>Galeocerda cuvier</i>	Tiger Shark	NT
<i>Prionace glauca</i>	Blue Shark	NT
<b>RAYS</b>		
<i>Taeniura lymma</i>	Bluespotted Lagoon Ray	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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