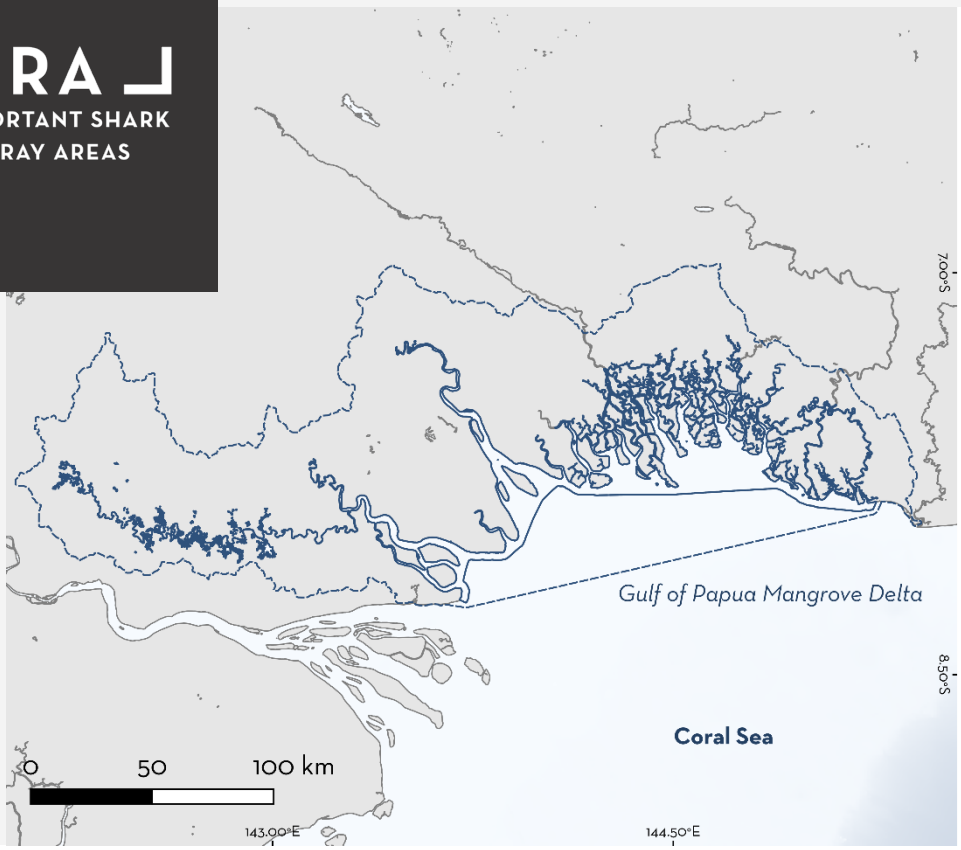
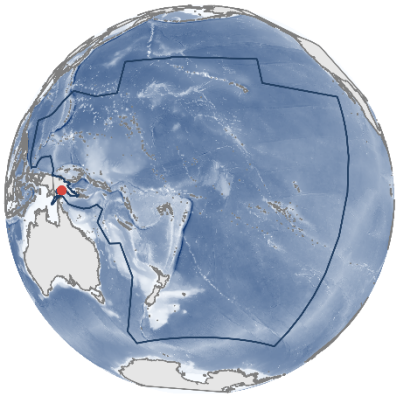
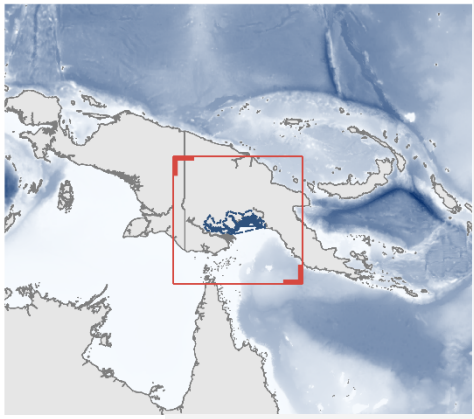
ISRA
IMPORTANT SHARK AND RAY AREAS







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

GULF OF PAPUA MANGROVE DELTA ISRA

New Zealand & Pacific Islands Region

PAPUA NEW GUINEA

0–20 metres

3,293.9 km²

SUMMARY

Gulf of Papua Mangrove Delta is located primarily in the Gulf Province of Papua New Guinea. The area encompasses several rivers, deltas, and river mouths from the Turama, Aramia, Bamu, Kikori, and Purai Rivers. The area is characterised by large high-flow river systems of freshwater with estuarine delta areas around their respective river mouths and adjacent coastline. The area is influenced by several rivers with a strong sediment outflow. Within the area there are: **threatened species** (e.g., Largetooth Sawfish *Pristis pristis*); **range-restricted species** (e.g., Northern River Shark *Glyphis garricki*); and **reproductive areas** (e.g., Winghead Shark *Eusphyra blochii*).

CRITERIA

Criterion A – Vulnerability; Criterion B – Range Restricted;
Sub-criterion C1 – Reproductive Areas

DESCRIPTION OF HABITAT

Gulf of Papua Mangrove Delta is located primarily in the Gulf Province of Papua New Guinea (and marginally into the Western (Fly) Province). The area encompasses several rivers, deltas, and river mouths from the Turama, Aramia, Bamu, Kikori, and Purai rivers. The area is characterised by large high-flow river systems of freshwater with estuarine delta areas around their respective river mouths and adjacent coastline. The area encompasses part of a broad continental shelf and the waters along the coastline have extensive mangrove and estuarine areas with high riverine input (Baje et al. 2022). The area is heavily influenced by several rivers with a strong sediment outflow, combined with a prevalent muddy to sandy seabed (White et al. 2019). The region experiences two main seasons: the northwest monsoon from November–March and the southeast monsoon from April–October (Baje et al. 2022). The area experiences a wet season (December–March) and a dry season (June–September).

This Important Shark and Ray Area is benthopelagic and is delineated from inshore and surface waters (0 m) to 20 m depth based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A – VULNERABILITY

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

CRITERION B – RANGE RESTRICTED

Gulf of Papua Mangrove Delta holds the regular and predictable presence of the Northern River Shark and Speartooth Shark as resident range-restricted species. These species are reported from the area based on ongoing fisheries observations and monitoring projects throughout the Gulf of Papua Mangrove Delta from 2017–2023 (Grant et al. 2021a, 2022a).

A total of 140 Northern River Sharks were recorded caught by artisanal fishers within the Gulf of Papua from Mia Kussa to Kikori River Delta, with most of the records occurring inside the area between 2017–2023 (Grant et al. 2021a). The species comprised ~57% of the shark and ray species composition recorded by fishers in the area (Grant et al. 2021a). All but one of these Northern River Shark observations came from villages within the area highlighting the importance of this area for this species. The Northern River Shark has a patchy distribution across northern Australia and southern Papua New Guinea (Kyne et al. 2021a) and occurs only in the North Australian Self Large Marine Ecosystem (LME) and the Northwest Australian Shelf LME, plus southern Papua New Guinea which is outside of any LMEs.

A total of 38 Speartooth Sharks were recorded caught by artisanal fishers within the Gulf of Papua from South Fly Coast to Kikori River Delta, with most of the records occurring inside the area between 2017–2023 (Grant et al. 2021a). The species comprised ~10% of the shark and ray species composition recorded by fishers in the area (Grant et al. 2021a). All but one of the observations of this species came from villages within the area, despite survey effort in the Kerema region and South Fly Coast (outside of this area). The Speartooth Shark has a patchy distribution across northern Australia and southern Papua New Guinea in macrotidal rivers, estuaries, and coastal marine waters

(Pillans et al. 2009; White et al. 2015; Kyne et al. 2021b) and occurs only in the North Australian Self LME and the Northeast Australian Shelf LME, plus southern Papua New Guinea which is outside of any LMEs.

SUB-CRITERION C1 – REPRODUCTIVE AREAS

Gulf of Papua Mangrove Delta is an important reproductive area for three shark and two ray species.

The area is used as a pupping ground and is important for early life history stages of Northern River Shark, Speartooth Shark, Winghead Shark, Largetooth Sawfish, and Dwarf Sawfish based on ongoing fisheries observations and monitoring projects throughout the Gulf of Papua Mangrove Delta area from 2017–2023 (Grant et al. 2021a, 2021b, 2022a). Local fishers primarily using gillnets presented their catches, including sawfish rostra and shark fins, to researchers who visited 2–3 villages or fishing camps daily. In some cases, researchers observed fishing activities over several days, particularly during the dry season (September–March). Total length (TL) was recorded for each whole animal encountered. Maturity was determined by inspection of clasper calcification in males or presence and size of uteri and ovaries (presence and size of ova) in females, while for small specimens, the presence of an umbilical scar was noted (Grant et al. 2021a, 2022a).

Winghead Sharks are highly abundant throughout the Gulf of Papua, with small individuals of this species being regularly and predictably caught within the area (White et al. 2019; Grant et al. 2021a, 2022a). During surveys in 2021–2023, three pregnant females with near-term embryos ranging from 35–50 cm TL were observed in November 2021 and 2022 (Y Amepou & M Grant unpubl. data 2024). The estimated size-at-birth of the species is 32–45 cm TL (Ebert et al. 2021). During these surveys, photographs were taken, and hundreds of individuals were determined to be neonate/ young-of-the-year (YOY) (Grant et al. 2022a). In 2022–2023, two villages collected 102 individuals <60 cm TL, which constituted 71% of their Winghead Shark landings from November 2022 to February 2023 around the Kikori-Purari and Turama River Deltas within the area (Y Amepou & M Grant unpubl. data 2024). In the previous 2021–2022 fishing season, 914 Winghead Sharks were observed and comprised the largest component of the catch (Grant et al. 2022a). In a subset of these 2021–2022 data, Winghead Sharks had a catch-per-unit-effort (CPUE) of 0.33 per 34 m net-hour, which was the highest across all fishes and more than four times higher than the next species group (Grant et al. 2022a). Although length data were not recorded in these surveys, most individuals were from small size classes.

Northern River Shark consistently constituted a large proportion of the shark and ray catch in all monitoring activities conducted between 2017–2023 in the mangroves within the area. During surveys conducted in southern Papua New Guinea (Kerema to Mia Kussa River) in 2017–2019, the Northern River Shark was the most commonly observed shark or ray species, representing 23.1% (n = 140 of 607) of individuals identified in fisheries landings and stockpiles of dried shark and ray products (fin and sawfish rostra) (Grant et al. 2021a). Based on size, all individuals were neonates, YOY, or small juveniles, ranging from 46–117 cm TL, with 65% (79 individuals) measuring <80 cm TL. The size-at-birth is estimated at 50–65 cm TL (Pillans et al. 2009), while in Papua New Guinea neonates with umbilical scars have been observed from 46–74 cm TL (Grant et al. 2021a). In subsequent surveys during 2021 and 2022 that focused on the mangrove delta regions around the Kikori-Purari and Turama River within the area, five Northern River Sharks and 196 river sharks identified to genus only (*Glyphis* spp.) were reported. While accurate length data were not available, there were no reports of large sharks being landed. In a subset of these 2021–2022 data, river sharks had a CPUE of 0.062 per 34 m net-hour, which was the second highest among all fishes (Grant et al. 2022a).

Speartooth Shark were regularly and predictably observed as bycatch in all monitoring activities conducted between 2017–2023 in mangrove deltas within the area. During surveys conducted in southern Papua New Guinea (Kerema to Mia Kussa River) in 2017–2019, 38 Speartooth Sharks were observed representing 6.3% (38/607) of individuals identified in fisheries landings and stockpiles of dried shark and ray products (Grant et al. 2021a). For those with size information (n = 28), all were neonates, YOY, or small juveniles measuring 44.2–122 cm TL; 85.7% (24 individuals) measured <80 cm TL. The size-at-birth is estimated at 50–65 cm TL (Pillans et al. 2009), while in Papua New Guinea neonates with umbilical scars have been observed up to 71.5 cm TL (Grant et al. 2021a). In subsequent surveys during 2021 and 2022 that focused on the area, two Speartooth Sharks and 196 sharks identified to genus only (*Glyphis* spp.) were reported. While accurate length data were not available, no reports of large sharks being landed were indicated. In a subset of these 2021–2022 data, *Glyphis* spp. had a CPUE of 0.062 per 34 m net-hour which was the second highest among all fishes (Grant et al. 2022a).

During surveys in 2017–2019, seven immature Dwarf Sawfish (103.0–248.4 cm TL) were observed along the southern coast of Papua New Guinea either directly or via dried rostra from recent catches (Grant et al. 2021a). The size-at-birth is estimated at 65 cm TL (Peverell 2008; White et al. 2017). Of these observations, six occurred in the Kikori-Purari and Turama River Delta region within the area, while this species was not detected in the Kerema Coast region to the east or from the adjacent part of the South Fly Coast to the southwest, both outside the area. Subsequent anecdotal observations of this species in the Kikori-Purari Delta have been made in 2020 and 2022. In early 2024, two probable YOY Dwarf Sawfish were filmed being released by fishers (M Grant pers. obs. 2024). Additionally, 15 unidentified sawfish observations have been made by fishery enumerators that are likely to either be Dwarf Sawfish or the congener Largetooth Sawfish. Dwarf Sawfish is considered Possibly Extinct throughout its east Indian and Southeast Asian range (Grant et al. 2022b). Contemporary records are rare outside of Australia, but the area is the only other location with verifiable contemporary and regular records of Dwarf Sawfish, including probable YOY and juveniles (M Grant pers. obs. 2024).

Largetooth Sawfish YOY are regularly caught by fishers in the upper section of the Turama River within the area (Grant et al. 2021a, 2021b). In November 2018, fishers at eight villages along the Turama River were interviewed about local knowledge of sawfish (Grant et al. 2021b). Within the area, nine rostra (19–24 cm standard rostral length) from Largetooth Sawfish were observed, with an estimated size range of 80–104 cm TL (Grant et al. 2021a). The estimated size-at-birth for the Largetooth Sawfish is 72–92 cm TL (Peverell 2008) indicating that all these individuals were YOY. Fishers in five of the six villages from Meagio Village near the river mouth, upstream to Moka I Village, all reported weekly catches of Largetooth Sawfish, while the fishers in the other village reported catches every few months. In both Meagio and Moka I Village, these weekly reports were corroborated whereby two YOY Sawfish had been caught at each of these villages upon a return stay 10 days later (M Grant pers. obs. 2024). In villages further upstream (not included in the area), Largetooth Sawfish were reported to be caught less frequently, every few months or yearly. Furthermore, within the area, fishers within the Lower Turama River reported that the size ranges of Largetooth Sawfish they catch are 100–200 cm, with only Meagio Village closer to the river mouth reporting capture of larger size classes additionally (Grant et al. 2021b). Overall, 37% of fishers interviewed along the Turama River perceived that sawfish populations (all species) had declined in their lifetime, while in the broader region of rivers surveyed in southern Papua New Guinea, the average across all interviews (2017–2019) was 66% reporting population declines (Grant et al. 2021b). This indicates that Turama River supports the highest abundance of Largetooth Sawfish compared to other rivers in southern Papua New Guinea (M Grant pers. obs. 2024). This area has high regional importance as it is the largest cluster of contemporary Largetooth Sawfish records in Papua New Guinea.

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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												
Eusphyra blochii	Winghead Shark	CR	0–127	X		X						
Glyphis garricki	Northern River Shark	VU	0–23	X	X	X						
Glyphis glyphis	Speartooth Shark	VU	0–23	X	X	X						
RAYS												
Pristis clavata	Dwarf Sawfish	CR	0–20	X		X						
Pristis pristis	Largetooth Sawfish	CR	0–60	X		X						

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Carcharhinus leucas	Bull Shark	VU
RAYS		
Anoxypristis cuspidata	Narrow Sawfish	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.

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