

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

## NORTHERN GULF OF PANAMA ISRA

### Central and South American Pacific Region

#### SUMMARY

Northern Gulf of Panama covers waters of the Panama provinces of Panamá Oeste, Darién, and Panamá. It encompasses diverse coastal, shelf, and insular habitats including coral reefs, muddy substrates, rocky shores, rivers, and mangrove ecosystems along with oceanographic features which promote high levels of primary productivity including seasonal upwellings. It includes crucial biological reserves including Wetlands of International Importance, a national mangrove-estuaries protected area, and Las Perlas Archipelago, a cluster of 255 islands, which represents the second largest archipelago in the Eastern Tropical Pacific. Within the area there are: **threatened species** (e.g., Whitesnout Guitarfish *Pseudobatos leucorhynchus*); **range-restricted species** (e.g., Southern Banded Guitarfish *Zapteryx xyster*); **reproductive areas** (e.g., Scalloped Hammerhead *Sphyrna lewini*); **feeding areas** (Whale Shark *Rhincodon typus*); and the area sustains a **high diversity of sharks** (21 species).

#### CRITERIA

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

PANAMA

0-125 metres

12,721 km<sup>2</sup>





## DESCRIPTION OF HABITAT

Northern Gulf of Panama covers waters of the Panama provinces of Panamá Oeste, Darién, and Panamá and sits within the Pacific Central-American Coastal Large Marine Ecosystem (LME). The area encompasses diverse habitats, including coral reefs, muddy substrates, rocky shores, rivers, and mangrove ecosystems. The substrate of the area is varied including hard carbonate, coral communities, seagrass, algae, sand, and mud (Benfield et al. 2007). Depths range from shallow coastal and insular areas inshore to deeper channels and basins to 125 m depth (Navionics 2022). The area includes significant mangrove ecosystems located in Panama Bay (a national mangrove-estuaries protected area), the Gulf of San Miguel, and Chame Bay. Panama Bay and Punta Patiño in the Gulf of San Miguel are Wetlands of International Importance (Ramsar sites). Within this area is Las Perlas Archipiélago (a Special Management Zone) composed of 255 islands. This archipelago represents the second largest in the Eastern Tropical Pacific. Between December and April, the area experiences an intense seasonal upwelling that promotes productivity, increasing the abundance of food sources such as plankton and small-pelagic fishes.

This Important Shark and Ray Area is delineated from surface and inshore waters (0 m) to a depth of 125 m based on the bathymetry of the area.

## ISRA CRITERIA

### CRITERION A - VULNERABILITY

Twenty-one Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species™ regularly occur in the area. Threatened sharks comprise four Critically Endangered species, four Endangered species, and five Vulnerable species; threatened rays comprise one Critically Endangered species and seven Vulnerable species (IUCN 2022).

### CRITERION B - RANGE RESTRICTED

The Northern Gulf of Panama holds the regular presence of the Southern Banded Guitarfish as a resident range-restricted species. This species occurs year-round in the area and is regularly encountered and caught in local fisheries, particularly trawls and purse seines in coastal habitats (YN Rodríguez Arriatti unpubl. data 2022). The species occurs primarily in the Pacific Central-American Coastal LME and its distribution only marginally extends into the Humboldt Current LME.

### SUB-CRITERION C<sub>1</sub> - REPRODUCTIVE AREAS

Northern Gulf of Panama is an important reproductive area one shark and one ray species.

Punta Chame is an important pupping and nursery ground for Scalloped Hammerheads (YN Rodríguez-Arriatti et al. unpubl. data 2022). Gravid females visit the area seasonally. Traditional ecological knowledge of local fishers indicate that there is an annual influx of large Scalloped Hammerheads in the area between February and May, which coincides with an increased presence of neonate and juvenile sharks in Punta Chame, indicating that these sharks arrive at the site to give birth.

The high level of captured neonates and young-of-the-year in local fisheries and fishery-independent surveys have supported the area's importance for parturition. Of 232 conventionally tagged individuals, 99% were young-of-the-year (average length: 53.4 cm total length [TL]), where the



average reported birth length was 47.5 cm TL (YN Rodríguez-Arriatti et al. unpubl. data 2022). Examination of umbilical scars (following Duncan & Holland 2006) was used to assess whether sharks were neonates, with the presence of an open umbilical scar confirming an individual was a neonate.

Darién Province has been considered an important nursery area for Largetooth Sawfish (Kyne et al. 2014) and has been identified as a bright spot for this Critically Endangered species in the Eastern Pacific (López-Angarita et al. 2021). There are several contemporary records (since the year 2000) of Largetooth Sawfish in the Gulf of San Miguel and Tuira River with one of the largest clustering of records in Panama (n = 10 records from six sites; López-Angarita et al. 2021). Largetooth Sawfish regularly occur in the area, with contemporary records from the years 2005, 2009, 2013, 2015, and 2022 (López-Angarita et al. 2021; Instagram 2022).

Records from 2005–2015 mostly originate from interviews with local fishers who were able to provide location-specific details where sawfish were caught. Largetooth Sawfish is the only sawfish species occurring in the Eastern Pacific, is distinctive from other shark and ray species, and is recognisable based on its elongated, tooth-studded rostrum. In addition to these interview results, one record is from a rostrum collected from the Tuira River in 2015 (López-Angarita et al. 2021).

The most recent record is a small individual captured and released on 06 August 2022 in the Tuira River, Chepigana (Instagram 2022). From the video footage of the release, this individual was estimated to be ~80 cm TL. This falls within the published size-at-birth for the species: 76 cm TL (Lake Nicaragua, Western Atlantic; Astorqui 1967); 73–80 cm TL (Lake Nicaragua, Western Atlantic; Thorson 1976); and 72–90 cm TL (Australia, Indo-West Pacific; Peverell 2009).

## SUB-CRITERION C2 – FEEDING AREAS

Northern Gulf of Panama is an important feeding area for one shark species. Satellite tagging has shown that Whale Sharks use this area as a foraging ground (Guzman et al. 2022). Concentrations of chlorophyll-a and primary productivity were significantly correlated with the foraging behavior of Whale Sharks in the area (Guzman et al. 2022), reinforcing the idea that it is being used as a feeding ground by this species. Moreover, the high productivity in the Northern Gulf of Panama is mainly associated with the upwelling systems that occur seasonally in the area and drive the production of plankton and resident small-pelagic fishes (e.g., anchovies, herrings) (MacKenzie et al. 2019), which attracts a high diversity of marine fauna, including Whale Sharks.

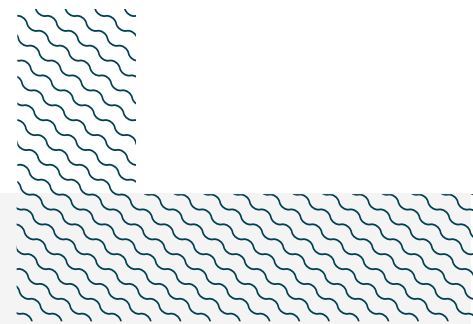
## SUB-CRITERION D2 – DIVERSITY

Northern Gulf of Panama sustains a high diversity of Qualifying Species (21 species). This exceeds the Central and South American Pacific regional threshold of 17 species.

The regular occurrence of these species in the Northern Gulf of Panama is supported through ongoing monitoring of artisanal and industrial fisheries. These species occur in the area either year-round or seasonally and are regularly encountered and caught in local fisheries, particularly trawls and purse seines operating in the Northern Gulf of Panama (Rodríguez-Arriatti 2011; CeDePesca 2016; Guzman et al. 2020; YN Rodríguez-Arriatti unpubl. data 2022). Additionally, Whale Shark has



been subject to research on movement and foraging grounds (Guzman et al. 2022) defining its regular occurrence in the area and Largetooth Sawfish records have been synthesised through fisher interviews along with recent records of a rostrum and a catch-and-release (López-Angarita et al. 2021; Instagram 2022).



---

### **Acknowledgments**

Jorge Manuel Morales-Saldaña (Smithsonian Tropical Research Institute), Yehudi N. Rodríguez-Arriatti (Universidad Marítima Internacional de Panamá), Yaliana Chichaco (Universidad Marítima Internacional de Panamá), Ángel J. Vega (Universidad de Panamá-Sede Veraguas), and Peter M. Kyne (IUCN SSC Shark Specialist Group - ISRA Project) contributed and consolidated information included in this factsheet. We thank the participants of the 2022 ISRA Region 12 - Central and South American Pacific workshop for their contributions to this process.

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. 2023.** Northern Gulf of Panama ISRA Factsheet. Dubai: IUCN SSC Shark Specialist Group.

## QUALIFYING SPECIES

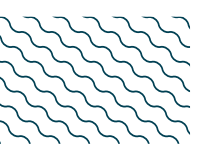
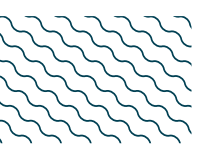
Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met										
				A	B	C1	C2	C3	C4	C5	D1	D2		
<b>SHARKS</b>														
<i>Alopias pelagicus</i>	Pelagic Thresher	EN	0-300	X										
<i>Carcharhinus cerdale</i>	Pacific Smalltail Shark	CR	0-40	X										X
<i>Carcharhinus falciformis</i>	Silky Shark	VU	0-500	X										
<i>Carcharhinus leucas</i>	Bull Shark	VU	0-164	X										
<i>Carcharhinus limbatus</i>	Blacktip Shark	VU	0-140	X										
<i>Ginglymostoma unami</i>	Pacific Nurse Shark	VU	0-13	X										
<i>Nasolamia velox</i>	Whitenose Shark	EN	0-192	X										
<i>Rhincodon typus</i>	Whale Shark	EN	0-1,928	X			X							
<i>Rhizoprionodon longurio</i>	Pacific Sharpnose Shark	VU	0-100	X										
<i>Sphyrna corona</i>	Scalloped Bonnethead	CR	0-100	X										
<i>Sphyrna lewini</i>	Scalloped Hammerhead	CR	0-1,043	X		X								
<i>Sphyrna media</i>	Scoophead Shark	CR	0-100	X										
<i>Sphyrna tiburo</i>	Bonnethead Shark	EN	0-90	X										

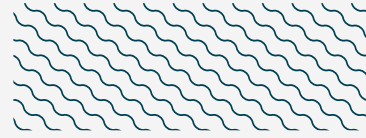
Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				A	B	C1	C2	C3	C4	C5	D1	D2
<b>RAYS</b>												
<i>Aetobatus laticeps</i>	Pacific Eagle Ray	VU	0-60	X								X
<i>Hypanus dipterurus</i>	Diamond Stingray	VU	0-150	X								
<i>Hypanus longus</i>	Longtail Stingray	VU	0-118	X								
<i>Mobula munkiana</i>	Munk's Pygmy Devil Ray	VU	0-30	X								
<i>Narcine entemedor</i>	Cortez Numbfish	VU	0-100	X								
<i>Pristis pristis</i>	Large-tooth Sawfish	CR	0-60	X		X						
<i>Pseudobatos leucorhynchus</i>	Whitesnout Guitarfish	VU	0-50	X								
<i>Zapteryx xyster</i>	Southern Banded Guitarfish	VU	1-150	X	X							

## SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
<b>SHARKS</b>		
<i>Alopias superciliosus</i>	Bigeye Thresher	VU
<i>Carcharhinus galapagensis</i>	Galapagos Shark	LC
<i>Galeocerdo cuvier</i>	Tiger Shark	NT
<i>Isurus oxyrinchus</i>	Shortfin Mako	EN
<i>Mustelus dorsalis</i>	Sharptooth Smoothhound	VU
<i>Mustelus henlei</i>	Brown Smoothhound	LC
<i>Mustelus lunulatus</i>	Sicklefin Smoothhound	LC
<i>Sphyrna mokarran</i>	Great Hammerhead	CR
<b>RAYS</b>		
<i>Rhinoptera steindachneri</i>	Pacific Cownose Ray	NT
<i>Rostroraja velezi</i>	Rasptail Skate	VU
<i>Styracura pacifica</i>	Pacific Chupare	VU
<i>Urotrygon aspidura</i>	Spinytail Round Ray	NT
<i>Urotrygon reticulata</i>	Reticulate Round Ray	CR
<i>Urotrygon rogersi</i>	Roger's Round Ray	NT
<i>Urotrygon simulatrix</i>	Fake Round Ray	VU

IUCN Red List categories: CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern; DD, Data Deficient.





## REFERENCES

- Astorqui I. 1967.** Investigaciones de un Jesuita en aguas de Nicaragua. 5. Nuestro pez sierra. *Revista Conservadora* 16: 71-75.
- Benfield SL, Guzman HM, Mair JM, Young JAT. 2007.** Mapping the distribution of coral reefs and associated sublittoral habitats in Pacific Panama: A comparison of optical satellite sensors and classification methodologies. *International Journal of Remote Sensing* 28: 5047-5070.
- Centro de Desarrollo y Pesca Sustentable (CeDePesca). 2016.** Pesquería de pequeños pelágicos en el Golfo de Panamá Informe de la captura incidental temporada 2016. Available at: [https://cedepesca.net/wp-content/uploads/2017/08/2017-01\\_CeDePesca\\_Informe-del-by-catch-de-la-pesquer%C3%ADa-de-PP\\_2016.pdf](https://cedepesca.net/wp-content/uploads/2017/08/2017-01_CeDePesca_Informe-del-by-catch-de-la-pesquer%C3%ADa-de-PP_2016.pdf) Accessed September 2022.
- Duncan KM, Holland KN. 2006.** Habitat use, growth rates and dispersal patterns of juvenile scalloped hammerhead sharks *Sphyrna lewini* in a nursery habitat. *Marine Ecology Progress Series* 312: 211-221. <https://doi.org/10.3354/meps312211>
- Guzman HM, Cipriani R, Vega AJ, Morales-Saldaña JM. 2020.** Fisheries and conservation assessment of sharks in Pacific Panama. *Aquatic Conservation: Marine and Freshwater Ecosystems* 30: 315-330. <https://doi.org/10.1002/aqc.3245>
- Guzman HM, Collatos CM, Gomez CG. 2022.** Movement, behavior, and habitat use of whale sharks (*Rhincodon typus*) in the Tropical Eastern Pacific Ocean. *Frontiers in Marine Science* 9: 793248. <https://doi.org/10.3389/fmars.2022.793248>
- Instagram. 2022.** Instagram post by pargos\_activos on 07 August 2022. Available at: <https://www.instagram.com/reel/Cg8EfrBN4OP/?igshid=YmMyMTA2M2Y%3D> Accessed September 2022.
- IUCN. 2022.** The IUCN Red List of Threatened Species. Version 2022-1, Available at: <https://www.iucnredlist.org> Accessed September 2022.
- Kyne PM, McDavitt MT, Graham RT. 2014.** Eastern Pacific Ocean. In: Harrison LR, Dulvy NK, eds. *Sawfish: a global strategy for conservation*. Vancouver: IUCN Species Survival Commission's Shark Specialist Group, 72-75.
- Kyne PM, Morales-Saldaña JM, Charvet P, Areano EM, Cevallos A, Espinoza M, González A, Herman K, Mejía-Falla PA, Navia AF. 2020.** *Urotrygon reticulata*. *The IUCN Red List of Threatened Species* 2020: e.T161541A124503331. <https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T161541A124503331.en>
- López-Angarita J, Cubillos-M JC, Villate-Moreno M, Del Cid A, Díaz JM, Cooke R, Cagua EF, Tilley A. 2021.** Bright spots for research and conservation of the largetooth sawfish *Pristis pristis* in Colombia and Panamá. *Endangered Species Research* 46: 147-160. <https://doi.org/10.3354/esr01150>
- MacKenzie KM, Robertson DR, Adams JN, Altieri AH, Turner BL. 2019.** Structure and nutrient transfer in a tropical pelagic upwelling food web: from isoscapes to the whole ecosystem. *Progress in Oceanography* 178: 102145. <https://doi.org/10.1016/j.pocean.2019.102145>
- Morales-Saldaña JM, Herman KB, Mejía-Falla PA, Navia AF, Areano E, Avalos Castillo CG, Espinoza M, Cevallos A, Pestana AG, González A, Pérez-Jiménez JC, Velez-Zuazo X, Charvet P, Kyne PM. 2022.** Eastern Pacific round rays. In: DellaSala DA, Goldstein MI, eds. *Imperiled: The Encyclopedia of Conservation, Volume 2*. Amsterdam: Elsevier, 773-783. <https://dx.doi.org/10.1016/B978-0-12-821139-7.00122-7>
- Navionics. 2022.** Navionics webapp, Available at: <https://webapp.navionics.com/> Accessed September 2022.
- Peverell SC. 2009.** Sawfish (Pristidae) of the Gulf of Carpentaria, Queensland, Australia. Unpublished Master's Thesis, James Cook University, Townsville.
- Rodríguez-Arriati YN. 2011.** Impacto de la pesquería artesanal en la disminución de las poblaciones de tiburones en el pacifico oriental de Panamá Proyecto "Plan piloto de Monitoreo de los Desembarques de Tiburones y Rayas en el Pacífico Oriental Panameño. Panamá City: Autoridad de los Recursos Acuáticos de Panamá.



**Thorson TB. 1976.** Observations on the reproduction of the sawfish, *Pristis perotteti*, in Lake Nicaragua, with recommendations for its conservation. In: Thorson TB, ed. *Investigations of the ichthyofauna of Nicaraguan lakes*. Lincoln: University of Nebraska, 641-650.