

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

NAYA-SANQUIANGA ISRA

Central and South American Pacific Region

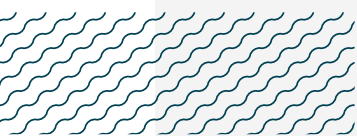
SUMMARY

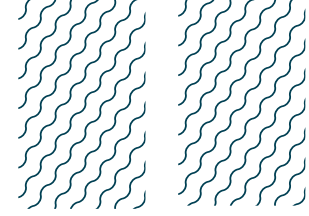
Naya-Sanquianga covers a large area of continental shelf in the Colombian central Pacific. It includes two Key Biodiversity Areas and all or part of three protected areas. There are diverse habitats including large and well-preserved coastal mangrove forests with muddy-sand bottoms, sandy and rocky substrates, and coral reefs around Gorgona Island. Within the area there are: **threatened species** (e.g., Largetooth Sawfish *Pristis pristis*); **range-restricted species** (e.g., Gorgona Guitarfish *Pseudobatos prahli*); **reproductive areas** (e.g., Longtail Stingray *Hypanus longus*); **resting areas** (Whitetip Reef Shark *Triaenodon obesus*); areas important for **movement** (e.g., Whale Shark *Rhincodon typus*); **undefined aggregations** (Scalloped Hammerhead *Sphyrna lewini*); and the area sustains a **high diversity of sharks** (37 species).

CRITERIA

Criterion A - Vulnerability; Criterion B - Range Restricted;
Sub-criterion C1 - Reproductive Areas; Sub-criterion C3 - Resting Areas;
Sub-criterion C4 - Movement; Sub-criterion C5 - Undefined Aggregations;
Sub-criterion D2 - Diversity

— —
COLOMBIA
 — —
0-1,129 metres
 — —
4,262 km²
 — —





DESCRIPTION OF HABITAT

Naya-Sanquianga covers a large area of continental shelf in central Pacific Colombia along the coast of Nariño, Cauca, and Valle del Cauca departments. Situated within the Pacific Central-American Coastal Large Marine Ecosystem (LME), the area includes two protected areas, Gorgona and Sanquianga National Natural Parks, and a southern portion of the Isla Aji Integrated Regional Management District. The area has high rainfall (3,000–8,000 mm/year) and has significant nutrient movement by rivers and tides. The sea surface temperature is 24.7–30.8°C and salinity is ~33.5 ppm in the oceanic zone and 20 ppm along the coast due to freshwater input.

This coastal area has considerable mangrove forest, with those of Sanquianga being the most conserved mangroves of the Colombian Pacific coast. Mangrove soils are of marine origin, formed by the decomposition of both materials transported by the sea and mangrove wood; they are peaty, acidic, flat, and muddy. Mangroves are periodically flooded by the tide, and interrupted by an intricate network of estuaries. There are also sandy and rocky substrates in deeper waters and coral reefs around Gorgona Island. The area has mainly shallow waters (<100 m) extending to depths of 1,129 m in the northwest zone.

Sanquianga is in a delta-estuarine complex formed by three rivers and a stream. The Naya River flows into Aji Grande estuary before flowing into the Pacific Ocean; it has a total channel length of 139.6 km, a total drainage area of 590.1 km², with an average annual flow of 107 m³/s. Gorgona Island is a continental island with rocky and sandy substrates and coral reefs in its western zone. Its seabed slopes strongly, especially to the 50 m depth contour along the central area with a pronounced submarine slope located ~2 km from the coastline (UAESPNN 2018).

This Important Shark and Ray Area is delineated from surface and inshore waters (0 m) to a depth of 1,129 m based on the maximum bathymetry of the area.

ISRA CRITERIA

CRITERION A - VULNERABILITY

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

The Red Book of Marine Fishes of Colombia (Chasqui et al. 2017) does not provide assessments for all Qualifying Species occurring in the area, hence a lower number of species are considered threatened using this classification. However, nine Qualifying Species considered threatened with extinction according to the Red Book of Marine Fishes of Colombia regularly occur in the area. Threatened sharks comprise six Vulnerable species; threatened rays comprise one Critically Endangered species and two Vulnerable species.

Two of the Vulnerable sharks according to the Red Book of Marine Fishes of Colombia are globally Least Concern on the IUCN Red List. Therefore, a total of 36 Qualifying Species considered threatened with extinction according to the IUCN Red List and/or the Red Book of Marine Fishes of Colombia regularly occur in the area.



CRITERION B - RANGE RESTRICTED

Naya-Sanquianga holds the regular presence of six resident range-restricted species: Leopard Numbfish, Gorgona Guitarfish, Chilean Angelshark, Pacific Chupare, Spinytail Round Ray, and Southern Banded Guitarfish. These species (except the Pacific Chupare) are restricted to the Pacific Central-American Coastal LME and the Humboldt Current LME. The Pacific Chupare is restricted to the Pacific Central-American Coastal LME and the Galápagos Islands (which falls outside of LMEs).

These species occur regularly in the area as evidenced by monitoring of industrial and artisanal fisheries in this zone, dive sightings, and specimen collections (e.g., Navia 2002; Navia et al. 2008; Hleap et al. 2010; Mejía-Falla et al. 2017). Leopard Numbfish and Spinytail Round Ray are more frequent in artisanal shrimp fisheries (Navia 2002; Payán et al. 2011b), but they are also recorded in industrial shrimp fisheries (Navia et al. 2007). Gorgona Guitarfish is observed by divers in the Isla Gorgona National Natural Park (Squalus Fundación unpubl. data 2022) and has been occasionally recorded in artisanal fisheries (Navia et al. 2008). Individuals of Chilean Angelshark and Spinytail Round Ray have been documented in local markets within the area from local fishing activities (Mejía-Falla et al. 2017).

SUB-CRITERION C₁ - REPRODUCTIVE AREAS

Naya-Sanquianga is an important reproductive area for three shark and one ray species.

Gravid female Blacktip Sharks are present in the area in the second half of each year (Bohórquez-Herrera 2006). The local population of this species has declined, and the area is considered important for reproduction given the regular presence of gravid females that contribute to the future population of the species.

Trophic relationships and genetic paternity indicate that Scalloped Hammerheads move between Malpelo Island (oceanic waters) and Sanquianga (coastal zone) for reproductive activities (Quintanilla et al. 2015; Estupiñan-Montaño et al. 2021a, 2021b). The mangrove habitat of the area is a nursery ground for Scalloped Hammerheads with neonates using mangroves for ~2 years before moving to oceanic areas.

Whitetip Reef Sharks are well known from Gorgona Island and are a regular feature of dives. An examination of photos and film from 427 dives between 2004-2011 allowed for the unique identification of 38 individual Whitetip Reef Sharks (from 538 photos and 111 films) (Mejía-Falla et al. 2014). The species was recorded in all months of the year indicating its residency. Gravid females, identifiable by their distended abdomens, were observed in June to November with pupping suggested to occur during October-November (Mejía-Falla et al. 2014). Observations included a female 'recaptured' in three different years (September 2004, June and September 2005, June 2011) which was gravid on all four of these observations (Mejía-Falla et al. 2014), demonstrating the regularity of reproduction in the area for this resident species.

Sampling of Longtail Stingray (n = 204) from the area in 2007-2008 showed that the area is utilised by all reproductive stages of the species with gravid females and neonates documented (López-García et al. 2011; Squalus Fundación unpubl. data 2022). Mature females had an ovarian fecundity of 1-20 eggs and gravid females had a uterine fecundity between 1-3 embryos. Neonates (with umbilical scars) were recorded in the months of June, August, and November (López-García et al. 2011; Squalus Fundación unpubl. data 2022).

SUB-CRITERION C3 - RESTING AREAS

Naya-Sanquianga is an important resting area for Whitetip Reef Shark which is present year-round. Direct observations during dive surveys have been made of the species resting at Gorgona Island (49.4% of records are of individuals resting) (Mejía-Falla et al. 2014).

SUB-CRITERION C4 - MOVEMENT

Naya-Sanquianga is an important area for the movement of two shark and one ray species. Stable isotopes indicate that Scalloped Hammerheads move between Malpelo Island (oceanic waters) and Sanquianga (coastal zone) (Estupiñán-Montaño et al. 2021a, 2021b). Moreover, genetic paternity analyses between adults of Malpelo Island and neonates and juveniles of Sanquianga found three parent-offspring pairs, demonstrating ontogenetic movement between these locations (Quintanilla et al. 2015).

This area is also considered a seasonal passage for Whale Sharks and Oceanic Manta Rays based on diver surveys where these species are predictably observed each year between April and August and March and September, respectively (Mejía-Falla et al. 2014). For the Whale Shark, this is also supported by satellite telemetry data (Fundación Malpelo unpubl. data 2022).

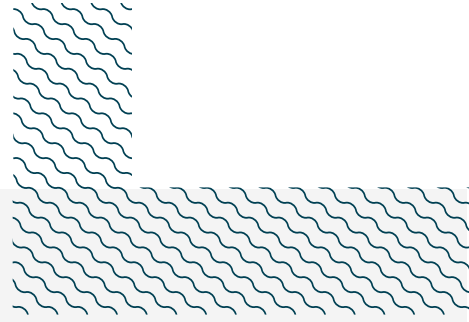
SUB-CRITERION C5 - UNDEFINED AGGREGATIONS

Naya-Sanquianga is an important area for aggregating Scalloped Hammerheads. Observations have been made close to Gorgona Island in 2010 and 2022. In 2022, 30 individuals were sighted in the western zone of the Island (Squalus Fundación unpubl. data 2022). Historical aggregations of Scalloped Hammerheads were also recorded at Gorgona Island in the 1980s. The exact function of these aggregations is unknown.

SUB-CRITERION D2 - DIVERSITY

Naya-Sanquianga sustains a high diversity of Qualifying Species (37 species). This exceeds the regional diversity threshold (17 species) for the Central and South Pacific American region.

The regular presence of Qualifying Species has been documented through scientific studies and monitoring of fisheries and is supported through the literature and unpublished data sources including Bohórquez-Herrera (2006); Mejía-Falla et al. (2006, 2007, 2014); Navia et al. (2006, 2007, 2009, 2012, 2013); Hleap et al. (2010); Payán et al. (2011a, 2011b); López-García et al. (2012); Mejía-Falla & Navia (2019); Naar (2019); Navia & Mejía-Falla (2006); Estupiñán-Montaño (2021a, 2021b); Ágreda et al. (2022); Fundación Malpelo unpubl. data (2022); Squalus Fundación unpubl. data (2022); Wildlife Conservation Society (WCS) unpubl. data (2022). For Largetooth Sawfish, the most recent record is from Ají Grande estuary in 2020 (WCS unpubl. data 2022).



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QUALIFYING SPECIES

Scientific Name	Common Name	IUCN Red List Category/ Red Book Colombia	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				A	B	C1	C2	C3	C4	C5	D1	D2
SHARKS												
<i>Alopias pelagicus</i>	Pelagic Thresher	EN/VU	0-300	X								X
<i>Carcharhinus albimarginatus</i>	Silvertip Shark	VU/--	0-800	X								
<i>Carcharhinus cerdale</i>	Pacific Smalltail Shark	CR/DD	0-40	X								
<i>Carcharhinus falciformis</i>	Silky Shark	VU/VU	0-520	X								
<i>Carcharhinus leucas</i>	Bull Shark	VU/--	0-164	X								
<i>Carcharhinus limbatus</i>	Blacktip Shark	VU/VU	0-140	X		X						
<i>Mustelus dorsalis</i>	Sharptooth Smoothhound	VU/--	20-200	X								
<i>Mustelus henlei</i>	Brown Smoothhound	LC/VU	1-281	X								
<i>Mustelus lunulatus</i>	Sicklefin Smoothhound	LC/VU	9-200	X								
<i>Nasolamia velox</i>	Whitenose Shark	EN/--	0-192	X								
<i>Odontaspis ferox</i>	Smalltooth Sand Tiger	VU/--	10-1,051	X								

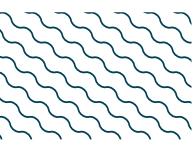
Scientific Name	Common Name	IUCN Red List Category/ Red Book Colombia	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				A	B	C1	C2	C3	C4	C5	D1	D2
<i>Rhincodon typus</i>	Whale Shark	EN/DD	0-1,928	X					X			X
<i>Rhizoprionodon longurio</i>	Pacific Sharpnose Shark	VU/--	0-100	X								
<i>Sphyrna corona</i>	Scalloped Bonnethead	CR/NT	0-100	X								
<i>Sphyrna lewini</i>	Scalloped Hammerhead	CR/VU	0-1,043	X		X			X	X		
<i>Sphyrna media</i>	Scoophead Shark	CR/--	0-100	X								
<i>Sphyrna tiburo</i>	Bonnethead Shark	EN/--	0-90	X								
<i>Sphyrna zygaena</i>	Smooth Hammerhead	VU/--	1-200	X								
<i>Squatina armata</i>	Chilean Angelshark	CR/--	0-400	X	X							
<i>Triaenodon obesus</i>	Whitetip Reef Shark	VU/LC	0-330	X		X		X				
RAYS												
<i>Aetobatus laticeps</i>	Pacific Eagle Ray	VU/NT	0-60	X								X
<i>Hypanus dipterus</i>	Diamond Stingray	VU/--	0-150	X								
<i>Hypanus longus</i>	Longtail Stingray	VU/VU	0-118	X		X						
<i>Mobula birostris</i>	Oceanic Manta Ray	EN/DD	0-1,000	X					X			
<i>Mobula mobular</i>	Spinetail Devil Ray	EN/--	0-1,112	X								
<i>Mobula munkiana</i>	Munk's Pygmy Devil Ray	VU/--	0-30	X								

Scientific Name	Common Name	IUCN Red List Category/ Red Book Colombia	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				A	B	C1	C2	C3	C4	C5	D1	D2
<i>Mobula thurstoni</i>	Bentfin Devil Ray	EN/--	0-100	X					X			X
<i>Narcine entemedor</i>	Cortez Numbfish	VU/--	0-100	X								
<i>Narcine leoparda</i>	Leopard Numbfish	VU/NT	1-35	X		X						
<i>Pristis pristis</i>	Large-tooth Sawfish	CR/CR	0-60	X								
<i>Pseudobatos leucorhynchus</i>	Whitesnout Guitarfish	VU/VU	0-50	X								
<i>Pseudobatos prahli</i>	Gorgona Guitarfish	VU/NT	1-70	X	X							
<i>Rostroraja equatorialis</i>	Equatorial Skate	VU/--	20-200	X								
<i>Rostroraja velezi</i>	Rasptail Skate	VU/--	30-300	X								
<i>Styracura pacifica</i>	Pacific Chupare	VU/--	0-30	X	X							
<i>Urotrygon aspidura</i>	Spinytail Round Ray	NT/LC	5-100		X							
<i>Zapteryx xyster</i>	Southern Banded Guitarfish	VU/DD	1-150	X	X							

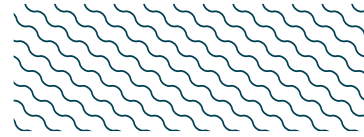
SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
<i>Carcharhinus altimus</i>	Bignose Shark	NT
<i>Galeocerdo cuvier</i>	Tiger Shark	NT
<i>Heterodontus mexicanus</i>	Mexican Hornshark	LC
<i>Heterodontus francisci</i>	Horn Shark	DD
<i>Notorynchus cepedianus</i>	Broadnose Sevengill Shark	NT
RAYS		
<i>Diplobatis ommata</i>	Pacific Dwarf Numbfish	LC
<i>Gymnura crebipunctata</i>	Mazatlán Butterfly Ray	NT
<i>Rhinoptera steindachneri</i>	Pacific Cownose Ray	NT
<i>Urobatis halleri</i>	Haller's Round Ray	LC
<i>Urotrygon rogersi</i>	Roger's Round Ray	NT

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



SUPPORTING INFORMATION



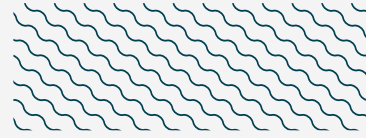
There are additional indications that Naya-Sanquianga is an important area for reproductive, feeding, movement, and aggregation purposes. The area may be an important area for reproduction in Southern Banded Guitarfish since females of all stages of maturity have been recorded in the area (Mejía-Falla et al. 2006) and Sicklefin Smoothhound which is known to pup in the area with an average fecundity of six (Bohórquez-Herrera 2006; Navia et al. 2006). Further information on the regularity of reproductive activities is needed.

Naya-Sanquianga may be an important feeding area for at least five species. The diversity of habitats utilised by these species (e.g., mangroves, sandy and rocky substrates, coral reefs) may provide important feeding areas for these species. Stomach content analysis is available for species as set out below, but further information is needed on the importance of the area for feeding relative to other areas.

Sicklefin Smoothhound diet in the area is dominated by stomatopods and *Portunus* crabs (Bohórquez-Herrera 2006, n = 117 stomachs analysed; Navia et al. 2007, n = 42); Longtail Stingray has a diet within the area comprised of shrimps and fishes (Navia et al. 2007, n = 21; López-García et al. 2012, n = 289); Leopard Numbfish has a diet dominated by polychaete worms (Naar 2019, n = 198); Whitesnout Guitarfish has a diet dominated by decapod crustaceans (Navia et al. 2007, n = 24; Payán et al. 2011a, n = 211); and, Southern Banded Guitarfish has a diet dominated by teleost fishes and penaeid shrimps (Mejía-Falla et al. 2006; Navia et al. 2007).

Satellite tag data is showing that Pelagic Thresher and Smalltooth Sand Tiger use the western area of Gorgona Island on their seasonal migratory movements (Fundación Malpelo unpubl. data 2022). Further information is required on the importance of the area for these movements.

Fishing data show a large number of individuals of the same species caught in a single fishing operation within the area (i.e., at the same location), suggesting that those species (Longtail Stingray, Brown Smoothhound, Sicklefin Smoothhound, Spinytail Round Ray, Roger's Round Ray) form aggregations in the area, although their functions are unknown (Navia & Mejía-Falla 2006; Navia et al. 2009, 2012, 2013).



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