

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

MALPELO RIDGE ISRA

Central and South American Pacific Region

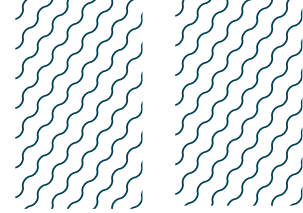
SUMMARY

Malpelo Ridge is a volcanic submarine ridge off Colombia. The area is within the Malpelo Fauna and Flora Sanctuary Marine Protected Area. The ridge rises ~4,000 m from the ocean floor and includes several seamounts with depths <600 m, although Malpelo Island is the only emergent feature of the ridge. Within this area there are: **threatened species** (e.g., Scalloped Hammerhead *Sphyrna lewini*); **reproductive areas** (e.g., Pacific Eagle Ray *Aetobatus laticeps*); **feeding areas** (e.g., Silky Shark *Carcharhinus falciformis*); **resting areas** (Whitetip Reef Shark *Triaenodon obesus*); areas important for **movement** (e.g., Whale Shark *Rhincodon typus*); **undefined aggregations** (Smalltooth Sand Tiger *Odontaspis ferox*); **distinctive attributes** (e.g., Galápagos Shark *Carcharhinus galapagensis*); and the area sustains a **high diversity of sharks** (21 species).

CRITERIA

Criterion A - Vulnerability; Sub-criterion C1 - Reproductive Areas; Sub-criterion C2 - Feeding Areas; Sub-criterion C3 - Resting Areas; Sub-criterion C4 - Movement; Sub-criterion C5 - Undefined Aggregations; Sub-criterion D1 - Distinctiveness; Sub-criterion D2 - Diversity

— —
COLOMBIA
 — —
0-1,928 metres
 — —
3,863 km²
 — —



DESCRIPTION OF HABITAT

Malpelo Ridge is located off the Pacific coast of Colombia, offshore of Valle del Cauca Department. The area extends in a northeast-southwest direction with a length of 300 km, a width of 100 km, and rises from ~4,000 m depth (Lonsdale & Klitgord 1978). Situated within the Pacific Central-American Coastal Large Marine Ecosystem, this submarine ridge system is the result of the interaction between the Galápagos 'hotspot' and the Coco-Nazca accretion centre. This interaction generated high volcanic activity that gave rise to Malpelo Island more than 20 million years ago (lower Miocene) (CCO & DIMAR 2019). Malpelo Island, located 500 km west of Buenaventura, Colombia, is the only emergent feature of the ridge.

The temporal dynamics of oceanographic conditions in the area are closely linked to the seasonal displacement of the intertropical convergence zone, with the main oceanographic characteristics in the area being the Gulf of Panama and Colombia currents. The latter is the dominant oceanographic forcing between December and April when the waters cool down and primary and secondary productivity increases (Rodríguez-Rubio et al. 2003; Rodríguez-Rubio & Giraldo 2011).

Malpelo Island and its surrounding marine area are recognised worldwide as a 'hotspot' for biodiversity due to its high species richness. Due to isolation, geomorphological characteristics, and environmental conditions, the area has high endemism and a high diversity of pelagic species (Parques Nacionales Naturales de Colombia 2022). The area is situated within the Malpelo Ridge Ecologically or Biologically Significant Marine Area (EBSA) (SCBD 2020) and the Malpelo Fauna and Flora Sanctuary Marine Protected Area.

This Important Shark and Ray Area is delineated from surface waters (0 m) to a depth of 1,928 m based on the known depth range of the Qualifying Species.

ISRA CRITERIA

CRITERION A – VULNERABILITY

Twenty 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, three Endangered species, and seven Vulnerable species; threatened rays comprise two Endangered species and three 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. Six shark species considered threatened with extinction according to the Red Book of Marine Fishes of Colombia regularly occur in the area.

SUB-CRITERION C₁ – REPRODUCTIVE AREAS

Malpelo Ridge is an important reproductive area for three shark and one ray species.

The resident Pacific Eagle Ray and Whitetip Reef Shark are known to undertake all life-cycle stages and exhibit all reproductive behaviours in the area with direct observations of mating and pupping (Bessudo & Lefevre 2017; Fundación Malpelo unpubl. data 2022).

For the migratory Silky Shark and Scalloped Hammerhead, courtship and fresh mating scars have been recorded between January and May. Neonates of these species have not been recorded in the



area suggesting that Malpelo Ridge is a mating ground for these species but not a pupping ground (Bessudo & Lefevre 2017). For Scalloped Hammerheads, this is also supported by studies of trophic relationships and genetic paternity indicating that they move between Malpelo Island and the coastal zone of Colombia to give birth (Quintanilla et al. 2015; Estupiñán-Montaño et al. 2021).

SUB-CRITERION C₂ - FEEDING AREAS

Malpelo Ridge is an important feeding area for five shark and one ray species.

Scalloped Hammerheads and Silky Sharks aggregate around Malpelo Island during the day, moving into deeper waters of Malpelo Ridge at night to feed (Bessudo et al. 2011a, 2011b; Estupiñán-Montaño et al. 2017, 2021). Aggregations of these species are large, for example, exceeding 1,000 individual Silky Sharks (Bessudo & Lefevre 2017). When feeding, Silky Sharks aggregate in the pelagic zone around schools of small fishes or floating objects where they feed on fishes, and direct observations of Pacific Eagle Ray, Galápagos Shark, Whale Shark, and Whitetip Reef Shark feeding activities have been regularly recorded by divers (Bessudo & Lefevre 2017).

SUB-CRITERION C₃ - RESTING AREAS

Malpelo Ridge, particularly Malpelo Island, is an important resting area for one shark species. Whitetip Reef Sharks are regularly recorded resting around the island where they are seen remaining stationary on the benthos during the day (Bessudo & Lefevre 2017).

SUB-CRITERION C₄ - MOVEMENT

Malpelo Ridge is an important movement area for at least five shark species. Tagging studies indicate that this area is important for maintaining connectivity with the broader Eastern Tropical Pacific.

Satellite tagged Pelagic Threshers (n = 12) showed extensive movements in the Eastern Tropical Pacific, mainly in pelagic zones and around seamounts. This includes movements along the Malpelo Ridge (Fundación Malpelo unpubl. data 2022).

Silvertip Sharks tagged at Cocos Island, Costa Rica, migrated to Malpelo Island in the boreal summer (Misión Tiburón unpubl. data 2022).

Satellite tagged Galápagos Sharks (n = 2) showed that this species remains on the Malpelo Ridge for long periods but does undertake migrations to the Galápagos and the northern Colombia coast (Fundación Malpelo unpubl. data 2022).

Tagged and photo-identified Whale Sharks (n = 18) have shown high connectivity with other areas of the Eastern Tropical Pacific (Parques Nacionales Naturales de Colombia 2022); this is a highly migratory species, generally spending only short periods of time around Malpelo Island.

Scalloped Hammerhead movement studies (n = 40 tagged) have revealed short but recurrent periods of residence around Malpelo Island as well as connectivity of this area with the broader Eastern Tropical Pacific (Bessudo et al. 2011a, 2011b). There is an apparent migration of females from Malpelo Ridge to the coast of northern Colombia in May (Fundación Malpelo unpubl. data 2022), which coincides with observations from divers, and is supported through known trophic relationships and genetic studies (Quintanilla et al. 2015; Bessudo & Lefevre, 2017; Estupiñán-Montaño et al. 2021).

SUB-CRITERION C5 - UNDEFINED AGGREGATIONS

Smalltooth Sand Tiger is poorly known within the area and the exact function of small aggregations observed at Malpelo Island is unknown and requires further investigation (Bessudo & Lefevre 2017; Fundación Malpelo unpubl. data 2022). The bulk of records of Smalltooth Sand Tigers globally are single individuals either caught in fisheries or observed by divers. Aggregations, consisting of up to six individuals, have only been recorded in Lebanon, New Zealand, and Malpelo Island (Fergusson et al. 2008). Therefore, the undefined aggregation at Malpelo Ridge is likely to be globally significant.

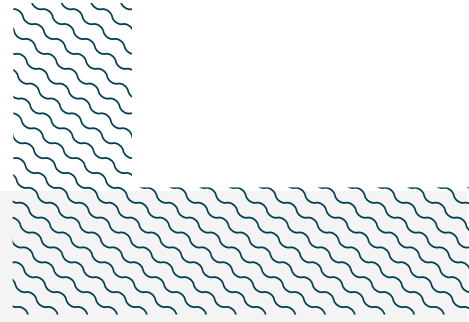
SUB-CRITERION D1 - DISTINCTIVENESS

Pacific Eagle Ray, Silky Shark, Galápagos Shark, Whale Shark, and Scalloped Hammerhead utilise cleaning stations at Malpelo Island (Bessudo & Lefevre 2017; Quimbayo et al. 2017). While some species (particularly mobulid rays) are known to regularly visit cleaning stations, eagle ray and shark visitation is not regularly described especially in the Eastern Pacific. Hence, these species visiting cleaning stations at Malpelo Island is considered distinctive.

SUB-CRITERION D2 - DIVERSITY

Malpelo Ridge sustains a high diversity of sharks (21 Qualifying Species). This exceeds the regional diversity threshold (17 species) for the Central and South Pacific American region.

The regular presence of these species has been documented through research expeditions, monitoring, and scientific studies as well as diver observations and is supported through the literature and unpublished data sources including: Bessudo et al. (2011a, 2011b, 2021); Quintanilla et al. (2015); Bessudo & Lefevre (2017); Estupiñán-Montaño et al. (2017, 2021); Quimbayo et al. (2017); Parques Nacionales Naturales de Colombia (2022); Fundación Malpelo unpubl. data (2022); Misión Tiburón unpubl. data (2022).



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QUALIFYING SPECIES

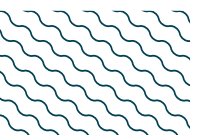
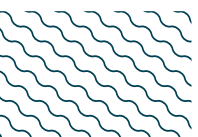
Scientific Name	Common Name	IUCN Red List Category / Red Book Colombia	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				A	B	C1	C2	C3	C4	C5	D1	D2
SHARKS												
<i>Alopias pelagicus</i>	Pelagic Thresher	EN/VU	0-300	X					X			X
<i>Alopias superciliosus</i>	Bigeye Thresher	VU/NT	0-955	X								
<i>Carcharhinus albimarginatus</i>	Silvertip Shark	VU/--	0-800	X					X			
<i>Carcharhinus falciformis</i>	Silky Shark	VU/VU	0-500	X		X	X				X	
<i>Carcharhinus galapagensis</i>	Galápagos Shark	LC/--	0-688	X			X		X		X	
<i>Carcharhinus limbatus</i>	Blacktip Shark	VU/VU	0-140	X								
<i>Carcharhinus longimanus</i>	Oceanic Whitetip Shark	CR/VU	0-1,082	X								
<i>Carcharhinus obscurus</i>	Dusky Shark	EN/--	0-500	X								
<i>Odontaspis ferox</i>	Smalltooth Sand Tiger	VU/--	10-1,051	X						X		
<i>Rhincodon typus</i>	Whale Shark	EN/DD	0-1,928	X			X		X		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		X	
<i>Sphyrna media</i>	Scoophead Shark	CR/--	0-100	X								
<i>Sphyrna mokarran</i>	Great Hammerhead	CR/VU	0-300	X								

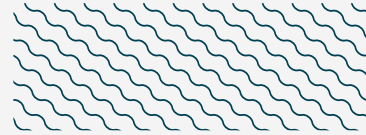
Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met										
				A	B	C1	C2	C3	C4	C5	D1	D2		
<i>Sphyrna zygaena</i>	Smooth Hammerhead	VU/--	0-200	X										
<i>Triaenodon obesus</i>	Whitetip Reef Shark	VU/LC	0-330	X		X	X	X						
RAYS														
<i>Aetobatus laticeps</i>	Pacific Eagle Ray	VU/NT	0-60	X		X	X							
<i>Mobula birostris</i>	Oceanic Manta Ray	EN/DD	0-1,000	X										
<i>Mobula tarapacana</i>	Sicklefin Devil Ray	EN/--	0-1,896	X										X
<i>Rostroraja equatorialis</i>	Equatorial Skate	VU/--	20-200	X										
<i>Rostroraja velezi</i>	Rasptail Skate	VU/--	30-300	X										

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
<i>Apristurus kampae</i>	Longnose Catshark	DD
<i>Echinorhinus cookei</i>	Prickly Shark	DD
<i>Galeocerdo cuvier</i>	Tiger Shark	NT
<i>Prionace glauca</i>	Blue Shark	NT
RAYS		
<i>Amblyraja hyperborea</i>	Boreal Skate	LC
<i>Bathyraja spinosissima</i>	Pacific White Skate	LC
<i>Diplobatis ommata</i>	Pacific Dwarf Numbfish	LC
<i>Rhinoptera steindachneri</i>	Pacific Cownose Ray	NT
<i>Tetronarce tremens</i>	Chilean Torpedo	LC

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





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