

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

ISLAS MARIÁS ARCHIPELAGO ISRA

Central and South American Pacific Region

SUMMARY

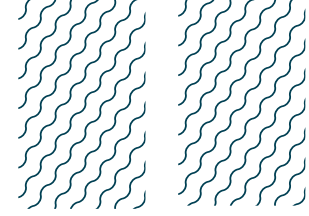
Islas Mariás Archipelago is located at the entrance of the Gulf of California in Mexico. The archipelago is formed by four islands of volcanic origin, about 120 km from the coast of the state of Nayarit. The islands are separated by shallow water channels (<30 m deep). The platform around the islands is very narrow. Due to the high levels of marine and terrestrial biodiversity and endemism, the archipelago was categorised as a Biosphere Reserve by the Mexican government in 2007 and then as a World Heritage Site by UNESCO. Within the area there are: **threatened species** (e.g., Smooth Hammerhead *Sphyrna zygaena*) and **undefined aggregations** (e.g., Silky Shark *Carcharhinus falciformis*).

CRITERIA

Criterion A - Vulnerability; Sub-criterion C5 - Undefined Aggregations

— —
MEXICO — —
 — —
0-1,000 metres — —
 — —
5,500.8 km² — —
 — —





DESCRIPTION OF HABITAT

Islas Marías Archipelago is at the entrance of the Gulf of California in the Exclusive Economic Zone of Mexico off the coast of Nayarit. Situated within the Pacific Central-American Large Marine Ecosystem, the area is where promontories influence the speed of marine currents coming from the southern Mexican Pacific. Due to the proximity of the islands to the Central Eastern Tropical Pacific region, the area can be described as tropical and oceanic (Palacios-Hernandez et al. 2010). Shallow channels between the four islands range in depth between 10–30 m. To the west, depths are around 200 m, but in the northeast end of San Juanito Island, there is a pronounced change in the slope where the depths vary between 300 and 660 m. To the west, the platform is very narrow descending to 1,000 m a short distance from the islands.

Around the four islands, the seabed is mostly made up of large rocks with steep slopes, cracks, and rocky bottoms. At depths between 15 and 30 m, the bottom is made up of sandy plains. In the southeast part of Isla San Juanito, the smallest island, the bottom is characterised by rocky and sandy patches (CONANP-SEMARNAT 2007, 2022). The main changes in temperature and salinity are between 40 and 100 m in depth (Palacios-Hernández et al. 2002). Below 300 m, the salinity distribution is the same as elsewhere in the tropical Pacific (Lavín et al. 2006). The proximity of the four islands with the coast of Nayarit (~120 km), which in turn has a wide and regular continental shape, creates the conditions to form cyclonic and anticyclonic eddies (Kurczyn et al. 2012). Wind direction changes seasonally. For instance, during the boreal winter months, winds come from the northwest, and during the boreal summer, winds coming from the west to the southwest dominate. The topography, together with the merging of the temperate water California Current and warm water of the Mexican Coastal Current derived from the Costa Rica Coastal Current, as well as the warm high salinity mass water coming out of the Gulf of California creates considerable turbulence and steep sea surface temperature gradients in the area (Zamudio et al. 2007; Kurian et al. 2011).

Due to the high levels of marine and terrestrial biodiversity, and endemism, the archipelago was categorised as a Biosphere Reserve by the Mexican government in 2007 and then as a World Heritage Site by UNESCO. In addition, it has been a protected area in Mexico since 2000 (DOF 2000; Moncayo-Estrada et al. 2006)

This Important Shark and Ray Area is delineated from inshore and surface waters (0 m) to a depth of 1,000 m based on the maximum global depth of the Qualifying Species.

ISRA CRITERIA

CRITERION A – VULNERABILITY

Two Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species™ regularly occur in the area. These are the Vulnerable Silky Shark (Rigby et al. 2021) and Smooth Hammerhead (Rigby et al. 2019).

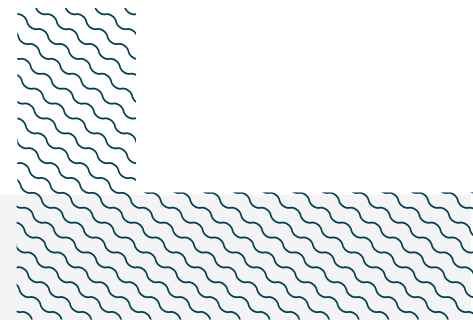
SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Islas Marías Archipelago is an important area for the aggregation of three shark species. Silky Shark, Blue Shark, and Smooth Hammerhead are targeted by fishers when they aggregate, but the purpose of these aggregations is unknown.



The capture of these shark species in the vicinity of Islas Mariás Archipelago by the Mexican industrial shark fisheries have been reported by on-board observers since 1986, demonstrating the seasonality of their abundance in the area (Vélez-Marín & Márquez-Farías et al. 2009; Castillo-Géniz & Tovar-Ávila 2016; Tovar-Ávila & Castillo-Géniz 2021; Fernández-Méndez et al. 2021; Martínez-Hernández 2021; Mellado-Flores 2022). These species are regularly observed and landed in artisanal fisheries in the area that seasonally target sharks from October and March (Pérez-Jiménez et al. 2005; Tovar-Ávila et al. 2020; Shaff 2022). Fishers have longstanding knowledge of this seasonality related to the migratory movements along the Mexican Pacific waters, driven by preferences for certain water conditions. Such knowledge allowed the development of a migratory fishery that targeted shark aggregations during the 1980s and 1990s around Islas Mariás, when fishers from the Chiapas state (in the southern Mexican Pacific) went to the Islas Mariás area and then moved to northern areas in the state of Sonora following the shark populations while they migrated (Pérez-Jiménez et al. 2005).

Between 1995–1996 and 2000–2001, artisanal fisheries operating in this area were monitored daily with 9,421 sharks examined. Smooth Hammerhead (155–280 cm total length [TL]) was the main species in landings, representing 35% of total shark catches in the area. This species is caught in higher numbers between January and March. Silky Shark (115–220 cm TL) and Blue Shark (115–250 cm TL) represented 28% and 27.5% of total shark catches, respectively. There was a peak in catches during November for Silky Shark and higher catches for Blue Shark from January to March (Tovar-Ávila et al. 2020).



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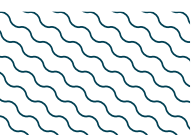
QUALIFYING SPECIES

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													
<i>Carcharhinus falciformis</i>	Silky Shark	VU	0-500	X							X		
<i>Prionace glauca</i>	Blue Shark	NT	0-1,000								X		
<i>Sphyrna zygaena</i>	Smooth Hammerhead	VU	1-200	X							X		

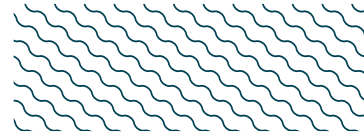
SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
<i>Alopias pelagicus</i>	Pelagic Thresher	EN
<i>Alopias superciliosus</i>	Bigeye Thresher	VU
<i>Carcharhinus brachyurus</i>	Copper Shark	VU
<i>Carcharhinus leucas</i>	Bull Shark	VU
<i>Carcharhinus limbatus</i>	Blacktip Shark	VU
<i>Carcharhinus obscurus</i>	Dusky Shark	EN
<i>Galeocerdo cuvier</i>	Tiger Shark	NT
<i>Ginglymostoma unami</i>	Pacific Nurse Shark	EN
<i>Isurus oxyrinchus</i>	Shortfin Mako	EN
<i>Mustelus lunulatus</i>	Sicklefin Smoothhound	LC
<i>Nasolamia velox</i>	Whitenose Shark	EN
<i>Negaprion brevirostris</i>	Lemon Shark	VU
<i>Rhizoprionodon longurio</i>	Pacific Sharpnose Shark	VU
<i>Sphyrna lewini</i>	Scalloped Hammerhead	CR
<i>Sphyrna mokarran</i>	Great Hammerhead	CR
<i>Triacnodon obesus</i>	Whitetip Reef Shark	VU

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 this area is important for aggregations of Shortfin Mako and Pelagic Thresher. Shortfin Mako is caught mostly from January to March, while Pelagic Thresher (160–325 cm TL) is caught in small numbers throughout the year. Both species seem to be caught while they aggregate within the area. Recent monitoring of landings supports these findings, with the same species being caught and from similar sizes (Tovar-Ávila et al. 2020). However, more evidence is needed to confirm the regular and predictable occurrence of these aggregations.



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