

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

## GALÁPAGOS PLATFORM ISRA

### Central and South American Pacific Region

#### SUMMARY

Galápagos Platform is located approximately 950 km from the Central/South American mainland. It is situated within the Galápagos Marine Reserve, which has been designated a UNESCO World Heritage Site and Biosphere Reserve, and within two Ecologically or Biologically Significant Marine Areas. The area includes all the main islands of the archipelago (except Darwin and Wolf) and includes over 100 islets and emergent rocks, encompassing a variety of marine habitats. These include rocky and coral reefs, sandy bays, mangroves, kelp forests, shallow seamounts, and deeper waters. Within this area there are: **threatened species** (e.g., Peruvian Eagle Ray *Myliobatis peruvianus*); **range-restricted species** (e.g., Whitespot Ghostshark *Hydrolagus albus*); **feeding areas** (Tiger Shark *Galeocerdo cuvier*); **undefined aggregations** (e.g., Oceanic Manta Ray *Mobula birostris*); and the area sustains a **high diversity of sharks** (29 species).

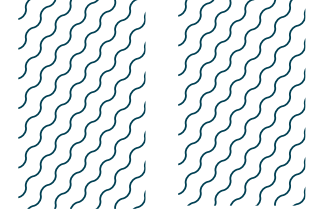
#### CRITERIA

**Criterion A - Vulnerability; Criterion B - Range Restricted;**  
**Sub-criterion C2 - Feeding Areas; Sub-criterion C5 - Undefined Aggregations;**  
**Sub-criterion D2 - Diversity**

— —  
**ECUADOR**

— —  
**0-1,928 metres**

— —  
**64,760 km<sup>2</sup>**



## DESCRIPTION OF HABITAT

Galápagos Platform is located approximately 950 km from the Central/South American mainland within the Exclusive Economic Zone of Ecuador. The area includes all the major islands of the Galápagos Archipelago, except for the remote, far northern islands of Darwin and Wolf. The area is situated within the Galápagos Marine Reserve, which has been designated a UNESCO World Heritage Site and Biosphere Reserve, and within two Ecologically or Biologically Significant Marine Areas (EBSAs), the Galapagos Archipelago and Western Extension and the Carnegie Ridge Equatorial Front. The Galápagos Marine Reserve, created in 1998, covers 138,000 km<sup>2</sup> of ocean extending 75 km from a baseline around the farthest points of the main islands. The islands included within the area were formed, and continue to grow, due to volcanic activity influenced by the Galápagos hotspot. Generation of magma occurs in the subsurface here due to an anomalously warm region of the mantle at the top of an ascending mantle plume. This molten rock is generated beneath the Galápagos Platform (Kurz & Geist 1999), occasionally rising to the surface to erupt at the volcanoes of the Galápagos Islands. The centre of volcanic activity above the Galápagos hotspot is currently beneath the western end of the Galápagos Platform and the western-most of the Galápagos Islands.

The islands sit at the confluence of major ocean currents; the cool Peru-Humboldt current from the southeast merges with the warm Panama Bight from the northeast, to feed the eastward-flowing South Equatorial Current. The relative strength of the two currents brings seasonal patterns to Galápagos: a cool dry season from July through December, and a warm, wet season for the other half of the year. The South Equatorial Current is also fed from below by the westward-flowing Equatorial Undercurrent, which rises to around 80 m just west of the islands. Wind forcing produces upwelling on the western margins of the islands (Forryan et al. 2021), which forms the basis of a highly productive food chain, and one of the world's most important tuna fishing grounds (Bucaram et al. 2018).

Interannual variability around the Galápagos Islands is mainly driven by the El Niño Southern Oscillation (ENSO) (Fiedler & Lavin 2017). During El Niño conditions, the atmospheric pressure gradient from east to west across the Pacific is weakened, which in turn reduces upwelling and leads to pooling of warm surface waters in the Eastern Tropical Pacific. El Niño irregularly occurs every two to seven years, by way of wind anomalies over the western and central Pacific flattening the equatorial thermocline across the basin (Fiedler 2002), and typically lasts 6-12 months (Bertrand et al. 2020). These conditions can also alternate with cool La Niña phases of Pacific upper-ocean water masses, which occur when the atmospheric pressure gradient is strengthened.

The maximum depth of the Galápagos Platform is around 500 m. At the platform break, the slope descends to >3,000 m. The area hosts an array of important habitats for different life stages of sharks and rays, including mangrove fringed lagoons, sandy beaches, coastal rocky reefs, offshore shallow seamounts, and open waters.

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

## ISRA CRITERIA

### CRITERION A – VULNERABILITY

Twenty-four 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 eight Vulnerable species; threatened rays comprise four Endangered species and four Vulnerable species (IUCN 2022).

## CRITERION B - RANGE RESTRICTED

Galápagos Platform holds the regular presence of four shark, one ray, and two chimaera species as range-restricted species.

Galápagos Bullhead Shark is likely endemic to the area. Although this species is reported to occur in Peru, populations of horned sharks in mainland Ecuador and Colombia previously thought to be Galápagos Bullhead Shark were found to be Horn Shark *Heterodontus francisci* (Kyne et al. 2020). Moreover, significant genetic variation has been found in this species among islands within the Galápagos suggesting limited dispersal capacity from natal sites (Hirschfeld 2021). Galápagos Bullhead Shark are commonly found on the western sides of the southern Galápagos islands (Acuña Marrero et al. 2018).

The chimaera species Galápagos Ghostshark and Whitespot Ghostshark are only known from the deeper water slopes of the Galápagos Platform (Barnett et al. 2006; Quaranta et al. 2006).

The deepwater Galápagos Catshark has only recently been described from insular slopes at depths of 428–562 m. Only immature specimens have been collected and it is likely the species' full depth range is not known (McCosker et al. 2012). However, surveys indicate that this species is 'not-uncommon' and has been recorded at multiple locations within the Galápagos.

Speckled Smoothhound has a disjunct distribution and is found only in the Humboldt Current Large Marine Ecosystem (LME) and the Galápagos (Dulvy et al. 2021) and is considered a resident species (Grove et al. 2022).

Peruvian Eagle Ray is restricted to a portion of the Peru and Chile coastline within the Humboldt Current LME. However, it has been also observed in the Galápagos (Calle-Morán & Béarez 2020) and is considered a resident species (Grove et al. 2022).

Spotted Houndshark is found in the Humboldt Current LME and the Galápagos. A recent study assessing Galápagos shark populations, found the Spotted Houndshark was the sixth most common shark species on Baited Remote Underwater Video Surveys (BRUVS) (36 individuals recorded in 629 deployments) within the area (Acuña Marrero et al. 2018).

## SUB-CRITERION C2 - FEEDING AREAS

Galápagos Platform is a feeding area for one shark species. Based on stable isotope analyses, the main prey item for large (>200 cm total length [TL]) Tiger Sharks has been confirmed to be Green Turtles *Chelonia mydas* (Salinas et al. 2019). Within the area, Tiger Sharks exhibit a high degree of philopatry around Green Turtle nesting areas along southeastern Isabela and northern Santa Cruz. Of 21 satellite tagged individuals, sharks were present in the area for up to three years, with only two Tiger Sharks leaving the Galápagos Marine Reserve, and both these individuals returned during the turtle-nesting season (Acuña-Marrero et al. 2017).

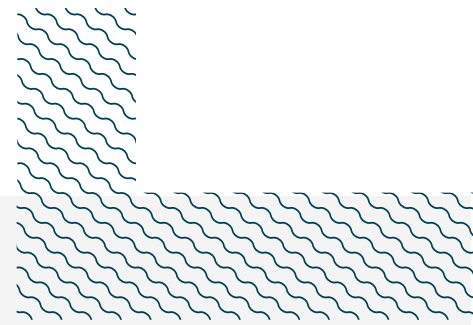
## SUB-CRITERION C5 - UNDEFINED AGGREGATIONS

Galápagos Platform is an important area for aggregations of one ray species. Oceanic Manta Ray

aggregations are often sighted by scuba divers in Isabela, Floreana, Pinzon, Santa Cruz, and Santiago (Hearn et al. 2014), particularly during the first quarter of the year (Guerrero 2022). Genetic samples taken from 21 Oceanic Manta Rays sampled in the Galápagos Platform, showed marked differences from Oceanic Manta Rays samples from mainland Ecuador, suggesting limited connectivity between these two locations (López et al. 2022).

## SUB-CRITERION D2 – DIVERSITY

Galápagos Platform sustains a high diversity of sharks (29 Qualifying Species). This exceeds the regional diversity threshold (17 species) for the Central and South Pacific American region. The regular presence of species was based on a combination of sources. For shallow, coastal inhabitants (e.g., Silvertip Shark and Pacific Eagle Ray), diver-conducted visual surveys provide evidence of the most common species (Hearn et al. 2014). Six species with more pelagic habitat preferences (Shortfin Mako, Smooth Hammerhead, Blue Shark, Common Thresher, Bigeye Thresher, and Pelagic Thresher) have been confirmed with experimental longline fishing (Murillo et al. 2004). Further records are known from specific experimental studies (e.g., Tiger Sharks; Acuña-Marrero et al. 2017), deepwater exploration (e.g., Galápagos Catshark; McCosker et al. 2012), and expert knowledge (Alex Hearn pers. obs.).



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### Suggested citation

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## QUALIFYING SPECIES

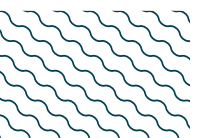
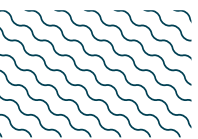
Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				A	B	C1	C2	C3	C4	C5	D1	D2
<b>SHARKS</b>												
<i>Alopias pelagicus</i>	Pelagic Thresher	EN	0-300	X								X
<i>Alopias superciliosus</i>	Bigeye Thresher	VU	0-955	X								
<i>Bythaelurus giddingsi</i>	Galápagos Catshark	LC	482-562		X							
<i>Carcharhinus albimarginatus</i>	Silvertip Shark	VU	0-800	X								
<i>Carcharhinus falciformis</i>	Silky Shark	VU	0-500	X								
<i>Carcharhinus limbatus</i>	Blacktip Shark	VU	0-140	X								
<i>Carcharhinus longimanus</i>	Oceanic Whitetip Shark	CR	0-1,082	X								
<i>Galeocerdo cuvier</i>	Tiger Shark	NT	0-1,136				X					
<i>Heterodontus quoyi</i>	Galápagos Bullhead Shark	LC	3-40		X							
<i>Isurus oxyrinchus</i>	Shortfin Mako	EN	0-888	X								
<i>Mustelus mento</i>	Speckled Smoothhound	CR	16-50	X	X							
<i>Nasolamia velox</i>	Whitenose Shark	EN	0-192	X								
<i>Odontaspis ferox</i>	Smalltooth Sand Tiger	VU	10-1,051	X								
<i>Rhincodon typus</i>	Whale Shark	EN	0-1,928	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 lewini</i>	Scalloped Hammerhead	CR	0-1,043	X									
<i>Sphyrna mokarran</i>	Great Hammerhead	CR	0-300	X									
<i>Sphyrna zygaena</i>	Smooth Hammerhead	VU	1-200	X									
<i>Triaenodon obesus</i>	Whitetip Reef Shark	VU	0-330	X									
<i>Triakis maculata</i>	Spotted Houndshark	VU	10-200	X	X								
<b>RAYS</b>													
<i>Hypanus dipterurus</i>	Diamond Stingray	VU	0-150	X									
<i>Hypanus longus</i>	Longtail Stingray	VU	0-118	X									
<i>Mobula birostris</i>	Oceanic Manta Ray	EN	0-1,000	X						X			
<i>Mobula mobular</i>	Spinetail Devil Ray	EN	0-1,000	X									X
<i>Mobula munkiana</i>	Munk's Pygmy Devil Ray	VU	0-30	X									
<i>Mobula tarapacana</i>	Sicklefin Devil Ray	EN	0-1,896	X									
<i>Mobula thurstoni</i>	Bentfin Devil Ray	EN	0-100	X									
<i>Myliobatis peruvianus</i>	Peruvian Eagle Ray	VU	0-50	X	X								
<b>CHIMAERAS</b>													
<i>Hydrolagus alphas</i>	Whitespot Ghostshark	LC	630-907		X								X
<i>Hydrolagus mccoskeri</i>	Galápagos Ghostshark	LC	396-506		X								

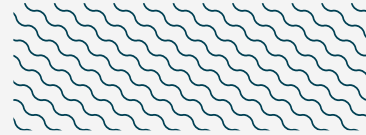
## SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
<b>SHARKS</b>		
<i>Carcharhinus galapagensis</i>	Galápagos Shark	LC
<i>Mustelus albipinnis</i>	White-margin Fin Smoothhound	LC
<i>Prionace glauca</i>	Blue Shark	NT
<i>Rhinoptera steindachneri</i>	Pacific Cownose Ray	NT

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



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