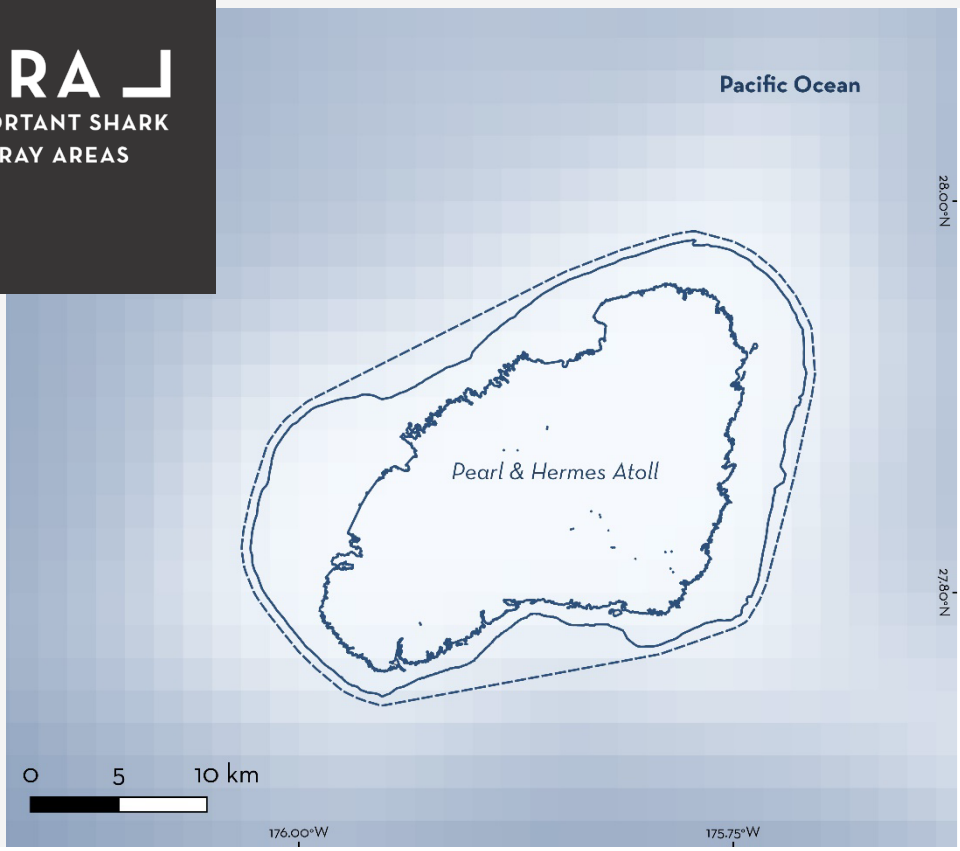
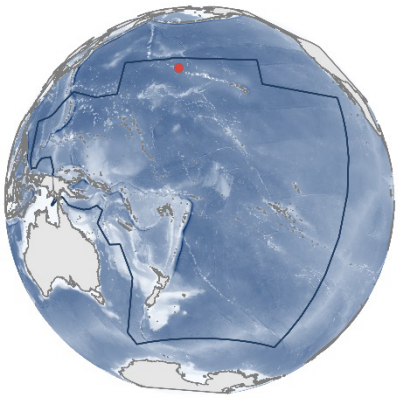
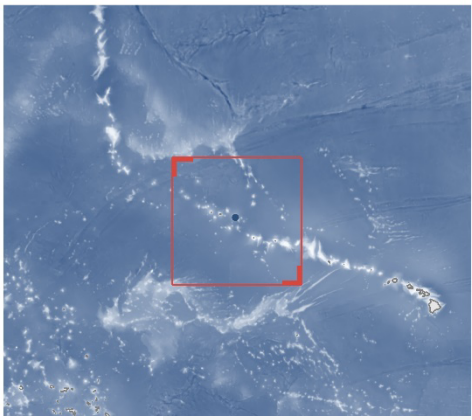
ISRA
IMPORTANT SHARK AND RAY AREAS







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

PEARL & HERMES ATOLL ISRA

New Zealand & Pacific Islands Region

HAWAII

0–60 metres

219.9 km²

SUMMARY

Pearl & Hermes Atoll is located in the Northwestern Hawaiian Islands of the United States of America. The atoll includes five islands and multiple islets that are submerged most of the time. A fringing reef surrounds the inner lagoon and is characterised by a reef crest, forereef, and backreef habitats with sandy substrates in the shallow lagoon. The area overlaps with the Northwestern Hawaiian Islands Key Biodiversity Area and the Papahānaumokuākea Marine National Monument. Within this area there are: **threatened species** (Whitetip Reef Shark *Triaenodon obesus*) and **undefined aggregations** (e.g., Galapagos Shark *Carcharhinus galapagensis*).

CRITERIA

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

DESCRIPTION OF HABITAT

Pearl & Hermes Atoll is located in the Northwestern Hawaiian Islands of the United States of America. It is the third northernmost atoll of Hawaii and is situated ~2,100 km from O'ahu and ~150 km from Midway Atoll. The atoll includes five islands (Southeast Island, Seal Kittery, North Island, Grass Island, and Little North Island) and multiple islets that are submerged most of the time. A fringing reef (~69 km) surrounds the inner lagoon (Kenyon et al. 2007). The exposed reef crests surround most of the area with forereef and backreef present along the reef crest except on the west opening (Page-Albins et al. 2012). Easterly trade winds dominate inshore water flow with higher swell from the northwest during October and May increasing the exposure and stress of reefs to waves (DeMartini et al. 2009; Page-Albins et al. 2012). Sea surface temperatures range from ~20°C in February to ~27°C in July (Desch et al. 2009).

The area overlaps with the Northwestern Hawaiian Islands Key Biodiversity Area (KBA 2024) and with the Papahānaumokuākea Marine National Monument (UNEP-WCMC & IUCN 2024).

This Important Shark and Ray Area is pelagic and is delineated from surface waters (0 m) to 60 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A – VULNERABILITY

One Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occurs in the area. This is the Vulnerable Whitetip Reef Shark (Simpfendorfer et al. 2020b).

SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Pearl & Hermes Atoll is an important area for undefined aggregations of two shark species.

There are regular Galapagos Shark aggregations in the area. Animals are also frequently reported in assemblages with Whitetip Reef Sharks. Records have been obtained via towed diver surveys (undertaken up to 30 m depth and covering ~2.5 linear km in ten five-minute segments) conducted in July–October between 2000–2016 (n = 202); baited remote underwater video stations (BRUVS) deployed at 5–100 m depths in September 2014 (n = 30); and stationary point count surveys (25 m transect lines during a timed five minute with four replicates) conducted in 2010, 2012, 2015, and 2016 (Holzwarth et al. 2006; CREP-PIFSC 2017a, 2017b; ESD-PIFSC 2018, 2019).

Between 2002–2016, Galapagos Sharks (n = 78) between 63–225 cm total length (TL) were observed in 37 of 192 towed dive surveys (19.2%) conducted in the area. Aggregations (average = 4 individuals) were recorded in all years except for 2016 and ranged from three to six individuals (CREP-PIFSC 2017a; ESD-PIFSC 2019). Further, Galapagos Sharks were observed in 23.3% (7/30; at 36–62 m depths) of the BRUVS deployed in 2014 with MaxN (maximum number of individuals of a species observed in a single frame) values ranging from 1–4 individuals (CREP-PIFSC 2017b). In stationary point surveys conducted in 2010, 2012, 2015, and 2016, Galapagos Sharks were observed in 25.2% of the surveys with aggregations observed in 2016 and 2017 (National Oceanic and Atmospheric Administration [NOAA] unpubl. data 2024). These are small-scale surveys that cover small areas and where aggregations are not well captured (Brainard et al. 2019). The presence of Galapagos Sharks in those surveys confirms their contemporary presence and suggests that aggregations still occur in

the area. Since 2017, no additional surveys have been conducted in the area. Additional information is required to determine the nature and function of these aggregations

Between 2002–2016, Whitetip Reef Sharks (n = 139) between 63–200 cm TL were observed in 85 of 202 towed dive surveys (42.1%) conducted in the area. Whitetip Reef Sharks were observed as solitary individuals or in pairs (CREP-PIFSC 2017a; ESD-PIFSC 2019). Further, Whitetip Reef Sharks were observed in 50% (15/30, 7–61 m depths) of the BRUVS deployed in 2014 with MaxN values ranging from 1–2 individuals (CREP-PIFSC 2017b). In stationary point surveys conducted in 2010, 2012, 2015, and 2016, Whitetip Reef Sharks were observed in 46.3% of surveys (2010: 12.1%; 2012: 16.1%; 2015: 39.1%; 2016: 41.1%; 2017: 60.0%; NOAA unpubl. data 2024). The presence of Whitetip Reef Sharks in those surveys confirms the contemporary presence of the species in the area.

Between 2000–2003, towed dive surveys were conducted in ten different sites across the Northwestern Hawaiian Islands, and Pearl & Hermes Atoll had the third largest densities for shark species in all the surveyed atolls with Galapagos Shark and Whitetip Reef Sharks being the most abundant shark species (Holzwarth et al. 2006). Both species formed assemblages in forereef habitats where the largest abundances for both species were observed. In addition, Galapagos Sharks were abundant in channels and Whitetip Reef Sharks equally abundant in backreefs and lagoon habitats (Holzwarth et al. 2006). Acoustic telemetry of five Galapagos Sharks monitored between 2011–2012 showed that tagged individuals were more detected in the southwest side of the atoll and distributed in deeper waters and mesophotic corals from September–December (Papastamatiou et al. 2015) Galapagos Sharks and Whitetip Reef Sharks have been reported as the most commonly observed shark species in the Northwestern Hawaiian Islands (Asher et al. 2019). In stationary point count surveys and towed dive surveys, Galapagos Sharks were always observed along with Whitetip Reef Sharks confirming that both species form assemblages in the area (CREP-PIFSC 2017a, 2017b; ESD-PIFSC 2018, 2019), similar to what has been reported for Galapagos Sharks with multiple shark species in locations from the Northwestern Hawaiian Islands (e.g., French Frigate Shoals; Dale et al 2011).

Acknowledgments

Kaylyn McCoy (NOAA Pacific Islands Fisheries Science Center), Adel Heenan (Bangor University), Julia Hartl (Hawai'i Institute of Marine Biology), Yannis Papastamatiou (Florida International University), and Emiliano García-Rodríguez (IUCN SSC Shark Specialist Group – ISRA Project) contributed and consolidated information included in this factsheet. We thank all participants of the 2024 ISRA Region 10 – New Zealand and Pacific Islands 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. 2024. Pearl & Hermes Atoll 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
SHARKS												
Carcharhinus galapagensis	Galapagos Shark	LC	0–528							X		
Triaenodon obesus	Whitetip Reef Shark	VU	0–330	X						X		

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Carcharhinus amblyrhynchos	Grey Reef Shark	EN
Carcharhinus plumbeus	Sandbar Shark	EN
Galeocerdo cuvier	Tiger Shark	NT
RAYS		
Aetobatus ocellatus	Spotted Eagle Ray	EN

IUCN Red List of Threatened Species Categories are available by searching species names at www.iucnredlist.org Abbreviations refer to: CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern; DD, Data Deficient.

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