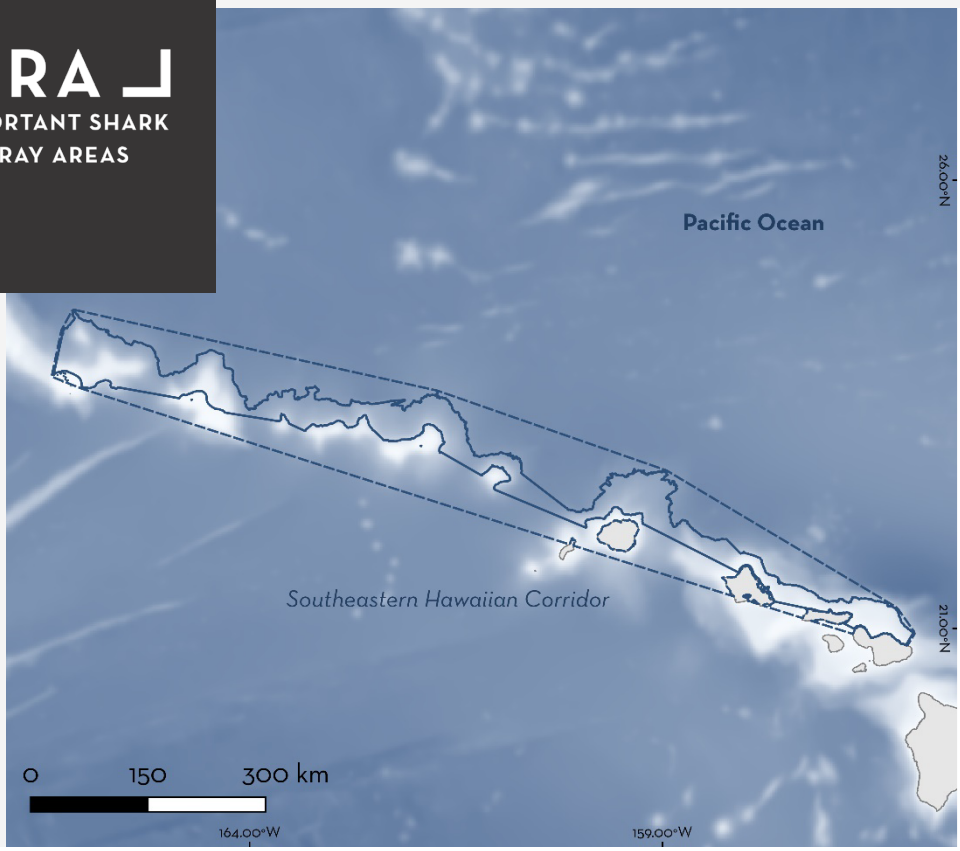
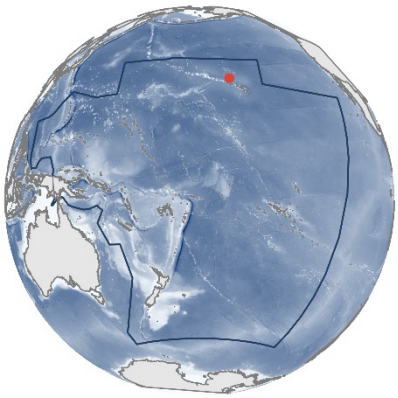
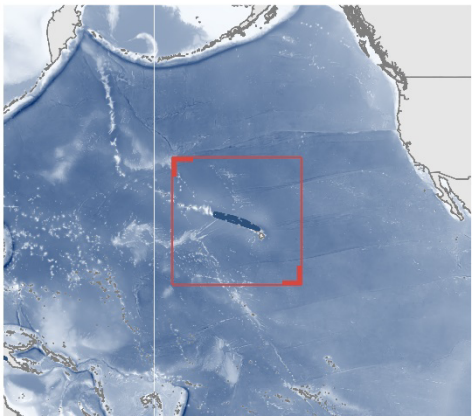
ISRA
IMPORTANT SHARK AND RAY AREAS







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

SOUTHEASTERN HAWAIIAN CORRIDOR ISRA

New Zealand & Pacific Islands Region

HAWAII

0–1,275 metres

39,380 km²

SUMMARY

Southeastern Hawaiian Corridor is located around the Hawaiian Archipelago of the United States of America. It extends from the French Frigate Shoals in the northwest to Maui in the southeast. The area is characterised by a narrow shelf and a steep slope with multiple seamounts, submarine canyons, and ridges. It lies on the boundary of the chlorophyll front leading to productive waters in the northern part of the area and oligotrophic conditions in the south. The area overlaps with the Northwestern Hawaiian Islands and the Molokai Island marine Key Biodiversity Areas, and the Papahānaumokuākea Marine National Monument. Within this area there are: **threatened species** (Scalloped Hammerhead *Sphyrna lewini*) and areas important for **movement** (e.g., Tiger Shark *Galeocerdo cuvier*).

CRITERIA

Criterion A – Vulnerability; Sub-criterion C4 – Movement

DESCRIPTION OF HABITAT

Southeastern Hawaiian Corridor is located around the Hawaiian archipelago of the United States of America. It extends from the French Frigate Shoals in the northwest to Maui in the southeast. The area includes inshore and offshore waters around Maui, Molokai, O'ahu, and Kauai in the Main Hawaiian Islands and offshore waters around Nihoa, Necker Island, and French Frigate Shoals. The area is characterised by a narrow shelf and a steep slope with multiple seamounts, submarine canyons, and ridges. The area lies on the boundary of the chlorophyll front that is characterised by productive waters in the northern part of the area and oligotrophic conditions around the Main Hawaiian Islands (Polovina et al. 2001).

Around the Main Hawaiian Islands, the oceanography is dominated by the North Pacific Subtropical High and the Aleutian Low producing warmer and drier conditions in the boreal summer influenced by northeasterly winds that produce mixing and upwelling in the channels between the islands. The southern part of the area is stable throughout the year with average sea surface temperatures ~25°C and a seasonal variation of ~2°C (Costa et al. 2010). The northern part of the area lies in the Northwestern Hawaiian Islands and sits in the boundary between the nutrient-poor surface waters of North Pacific Subtropical Gyre and the nutrient-rich surface waters of the North Pacific Subpolar Gyre (Desch et al. 2009). Sea surface temperatures range from ~23°C in winter to 27°C in summer (Desch et al. 2009).

The area overlaps with the Molokai Island marine and with the Northwestern Hawaiian Islands Key Biodiversity Areas (KBA 2024a, 2024b). It also overlaps 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 1,275 m based on the global depth range of the Qualifying Species.

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 Critically Endangered Scalloped Hammerhead (Rigby et al. 2019).

SUB-CRITERION C4 – MOVEMENT AREAS

Southeastern Hawaiian Corridor is an important movement area for two shark species.

Between January 2004–September 2011, monitoring of acoustic-tagged Tiger Sharks at the French Frigate Shoals revealed inter-island movements around the Hawaiian archipelago (Papastamatiou et al. 2013). Acoustic receivers were deployed on every island and atoll of the Hawaiian Islands. Of 58 sharks tagged, 50 were females measuring 201–450 cm total length (TL; 381 ± 61 cm) with 80% being mature. This monitoring showed what has been previously reported in acoustic and satellite telemetry studies, that some Tiger Sharks remain relatively resident to the French Frigate Shoals year-round while others aggregate there in June–July to feed on fledgling albatross chicks and disperse during the other months (Lowe et al. 2006; Meyer et al. 2010, Papastamatiou et al. 2013). After the fledging season is over, it has been predicted that 25% of mature females make inter-island movements from the French Frigate Shoals to the Main Hawaiian Islands, separated by ~1,200 km, to

potentially give birth there from September–November (Papastamatiou et al. 2013). Sex ratios of individuals tagged are heavily skewed to females, as males are believed to reside further offshore. Unlike females however, males showed minimal evidence of inter-island swimming. Tiger Sharks are considered partial migrators at French Frigate Shoals, showing skipped breeding partial migrations. Female Tiger Sharks in Hawaii are thought to reproduce every three years, so only one third of the individuals observed are pregnant at any one time (Whitney & Crow 2007). Further, 12 Tiger Sharks (eight females and four males) tagged with acoustic transmitters in O'ahu and monitored between 2013–2015 in receivers deployed in O'ahu and Maui showed smaller inter-island movements (Meyer et al. 2018). Females measured 217–414 cm TL with five (62.5%) being mature, while males measured 278–383 cm TL, with three (75%) being mature. Of these sharks, two mature females, one mature female and two immature male/female made movements to Maui during autumn (Meyer et al. 2018). Previous studies have suggested that this is the mating season around Maui (Whitney & Crow 2007) suggesting that these movements are triggered by reproductive purposes (Meyer et al. 2018). Movements from O'ahu to Maui have been previously reported from acoustically tagged Tiger Sharks (n = 27) between 2004–2010, with a prediction of 10% of females making these movements (Papastamatiou et al. 2013).

Between 2009–2017, 27 Scalloped Hammerheads (22 adult males, 2 juvenile males, and 3 juvenile females) measuring 106–310 cm TL were tagged either with acoustic transmitters (n = 25), satellite transmitters (n = 21), or a combination of both (n = 19). Animals were monitored between 2009–2020 (Hutchinson et al. 2023). Only seven Scalloped Hammerheads tagged with archival tags (PAT) provided sufficient data (11–252 days) due to mortality events or tag malfunction. Of these individuals, repeated movements around O'ahu were observed for five sharks with deployments of less than 77 days. Of the two sharks with the longest monitoring period, one (241 days) showed back and forth movements between O'ahu and Molokai while the other shark (252 days) left O'ahu one month after tagging and moved northwest until reaching the French Frigate Shoals where the tag detached (Hutchinson et al. 2023). Only three adult males tagged with fin mount satellite tags (SPOT) provided useful information (188–432 days) and two showed movements from Kāne'ohe Bay to French Frigate Shoals, with one shark staying there for 183 days and the other moving back to O'ahu (Hutchinson et al. 2023). In addition, 13 of the male sharks tagged with acoustic transmitter provided enough detections (>25; 13–397 days detected) to explore their movements, with all of them being detected almost exclusively in receivers deployed around O'ahu Islands and specifically in Kāne'ohe Bay where all sharks were tagged. Scalloped Hammerheads were detected in the bay mostly between May–September, with seven of the sharks being detected across multiple years (average of three non-consecutive years; Hutchinson et al. 2023). Kāne'ohe Bay has been reported as a nursery area for Scalloped Hammerheads, with pups born in summer (Duncan & Holland 2006). Adult males may visit the area to mate with females that come to the bay to pup. Further, predation of pups by adult Scalloped Hammerheads has been reported in the area, suggesting that repeated movements of the sharks across multiple years may also be triggered by feeding (Clarke 1971; Hutchinson et al. 2023).

Acknowledgments

Yannis Papastamatiou (Florida International University), Julie Hartl (Hawai'i Institute of Marine Biology), 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. Southeastern Hawaiian Corridor 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												
Galeocerdo cuvier	Tiger Shark	NT	0–1,275						X			
Sphyrna lewini	Scalloped Hammerhead	CR	0–1,043	X					X			

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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