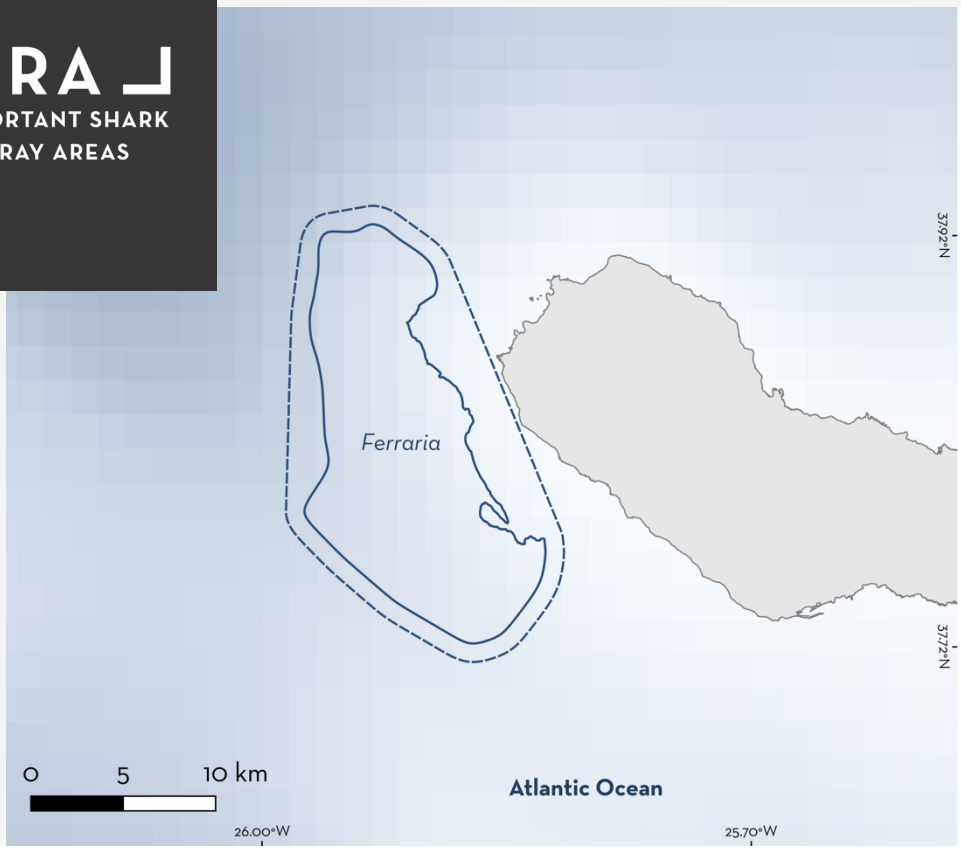
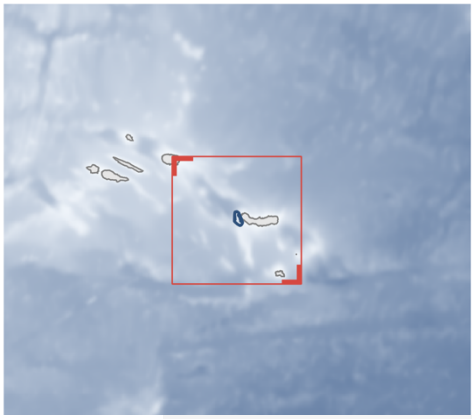
ISRA
IMPORTANT SHARK AND RAY AREAS





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

FERRARIA ISRA

European Atlantic Region

PORTUGAL

0–1,675 metres

162.5 km²

SUMMARY

Ferraria is located off São Miguel Island in the Azores Archipelago of Portugal. It is situated along the northern slope of the Monaco Graben between Ginetes and Feteiras parishes. The area comprises pelagic waters above predominantly fine sediment substrates interspersed with volcanic rocky outcrops. Turbidity and bottom currents enhance vertical mixing and nutrient flux through this tectonically complex region. Within this area there are: **threatened species** and **undefined aggregations** (Sicklefin Devil Ray *Mobula tarapacana*).

CRITERIA

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

DESCRIPTION OF HABITAT

Ferraria is located off São Miguel Island in the Azores Archipelago of Portugal. It is situated along the slope between Ginetes and Feteiras parishes, within the Ponta Delgada municipality. The substrate is composed predominantly of fine sediment interspersed with volcanic rocky outcrops (Weiß et al. 2016). This slope, also known as the Northern Monaco Graben Shoulder, transitions into the Monaco Graben, a tectonically complex region marked by fault scarps, volcanic ridges, and structural gateways (Weiß et al. 2016).

Turbidity and bottom currents enhance vertical mixing and nutrient flux (Weiß et al. 2016). Regional circulation is shaped by the North Atlantic Current to the north and the Azores Front/Current System to the south, which together delineate the boundary of the North Atlantic Subtropical Gyre (Pérez et al. 2003; Caldeira & Reis 2017). These oceanographic features promote phytoplankton retention and productivity, fuelling secondary production (Amorim et al. 2017). Sea surface temperatures range from ~15°C in March to ~25°C in late boreal summer, with peak chlorophyll concentrations occurring during the spring bloom and declining through summer (García et al. 2022).

This Important Shark and Ray Area is pelagic and is delineated from surface waters (0 m) to 1,675 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 Endangered Sicklefin Devil Ray (Marshall et al. 2022).

SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Ferraria is an important area for undefined aggregations of one ray species.

Opportunistic boat-based sightings of sharks and rays around São Miguel Island from ecotourism companies focused mainly on whale-watching, as well as also scuba diving boats, sailing charters, and observations from independent collaborators were gathered into a database (Elasmobase Azores unpubl. data 2024). Between April–October 2024, for each observation, the following information was collected: species, number of individuals, size estimate, behaviour, location, observer, and company. Of 145 occasions reported by 10 different organisations, 26 were of Sicklefin Devil Rays, 14 of which were within this area. Sicklefin Devil Rays were estimated to measure 200–250 cm disc width. Seven instances were reports of aggregations of 8–15 (average = 12) individuals (all within this area) observed between June–August (Elasmobase Azores unpubl. data 2024). Aggregations of Sicklefin Devil Rays are known to occur in the Azores between June–October (Sobral & Afonso 2014).

Additionally, a tailored interview survey was developed to gather local ecological knowledge (LEK) from São Miguel's commercial fishing community (Elasmobase Project unpubl. data 2025). One on one interviews using semi-structured questions followed the snowball technique, and images of live and dead shark and ray species common to the Azores were used to aid responses of respondents. Whenever possible, interviews were held with vessel captains, and if unavailable, the first officer was interviewed. Vessel selection was random. Of 27 interviews, 13 responded about the frequency of

Sicklefin Devil Ray observations around São Miguel, and four, with more than 10 years of experience, reported the sightings as often, frequently, or always (Elasmobase Azores unpubl. data 2024). Of the eight that named the main areas where they most see Sicklefin Devil Rays, four pointed to this area. The presence of Sicklefin Devil Ray aggregations in this area was also supported by all six divers from four different companies that were informally interviewed, and three experienced spearfishers (27–42 years fishing), having dived in this area for 6–20 years. They all reported opportunistic observations of Sicklefin Devil Rays as single individuals or within aggregations, mainly from July to October each year.

Acknowledgments

Inês Caseiro Dias (Elasmobase Project), Antonio Sabuco Blaya (Elasmobase Project), Fátima Pérez Neira (Elasmobase Project), Maria Joana Batalha (Elasmobase Project), Beatriz Silva (Elasmobase Project), and Vanessa Bettcher Brito (IUCN SSC Shark Specialist Group – ISRA Project) contributed and consolidated information included in this factsheet. We thank all participants of the 2025 ISRA Region 02 – European Atlantic 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. 2025. Ferraria 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
RAYS												
Mobula tarapacana	Sicklefin Devil Ray	EN	0–1,896	X						X		

SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
Prionace glauca	Blue Shark	NT
Rhincodon typus	Whale Shark	EN
Sphyrna zygaena	Smooth Hammerhead	VU
RAYS		
Mobula birostris	Oceanic Manta 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.

REFERENCES

Amorim P, Perán AD, Pham CK, Juliano M, Cardigos F, Tempera F, Morato T. 2017. Overview of the ocean climatology and its variability in the Azores region of the North Atlantic including environmental characteristics at the seabed. *Frontiers in Marine Science* 4: 56. https://doi.org/10.3389/fmars.2017.00056

Caldeira RMA, Reis JC. 2017. The Azores confluence zone. *Frontiers in Marine Science* 4: 37. https://doi.org/10.3389/fmars.2017.00037

García LG, Pierce GJ, Autret E, Torres-Palenzuela JM. 2022. Alongside but separate: Sympatric baleen whales choose different habitat conditions in São Miguel, Azores. *Deep Sea Research Part I: Oceanographic Research Papers* 184: 103766. https://doi.org/10.1016/j.dsr.2022.103766

Marshall A, Barreto R, Bigman JS, Carlson J, Fernando D, Fordham S, Francis MP, Herman K, Jabado RW, Liu KM, et al. 2022. *Mobula tarapacana* (amended version of 2019 assessment). *The IUCN Red List of Threatened Species* 2022: e.T60199A214371388. https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T60199A214371388.en

Pérez FF, Gilcoto M, Ríos AF. 2003. Large and mesoscale variability of the water masses and the deep chlorophyll maximum in the Azores Front. *Journal of Geophysical Research* 108: 3215. https://doi.org/10.1029/2000jc000360

Sobral AF, Afonso P. 2014. Occurrence of mobulids in the Azores, central North Atlantic. *Journal of the Marine Biological Association of the United Kingdom* 94: 1671–1675. https://doi.org/10.1017/S0025315414000964

Weiß BJ, Hübscher C, Lüdmann T, Serra N. 2016. Submarine sedimentation processes in the southeastern Terceira Rift/São Miguel region (Azores). *Marine Geology* 374: 42–58. https://doi.org/10.1016/j.margeo.2016.02.004