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FISHERIES

IN THE REVISION OF THE OCEANIC MARINE PROTECTED AREAS IN THE AZORES

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This document was prepared by the Blue Azores program as part of the proposal to revise the Azores Marine Park and the Azores Marine Protected Areas Network. It presents a set of available data on the potential interaction between fishing activities and the proposal to amend of the Azores Marine Park, as well as a set of potential support measures for the restructuring of the fisheries sector, based on international best practices and measures discussed with the fisheries representatives in the Azores.

January 2024

CONTENTS

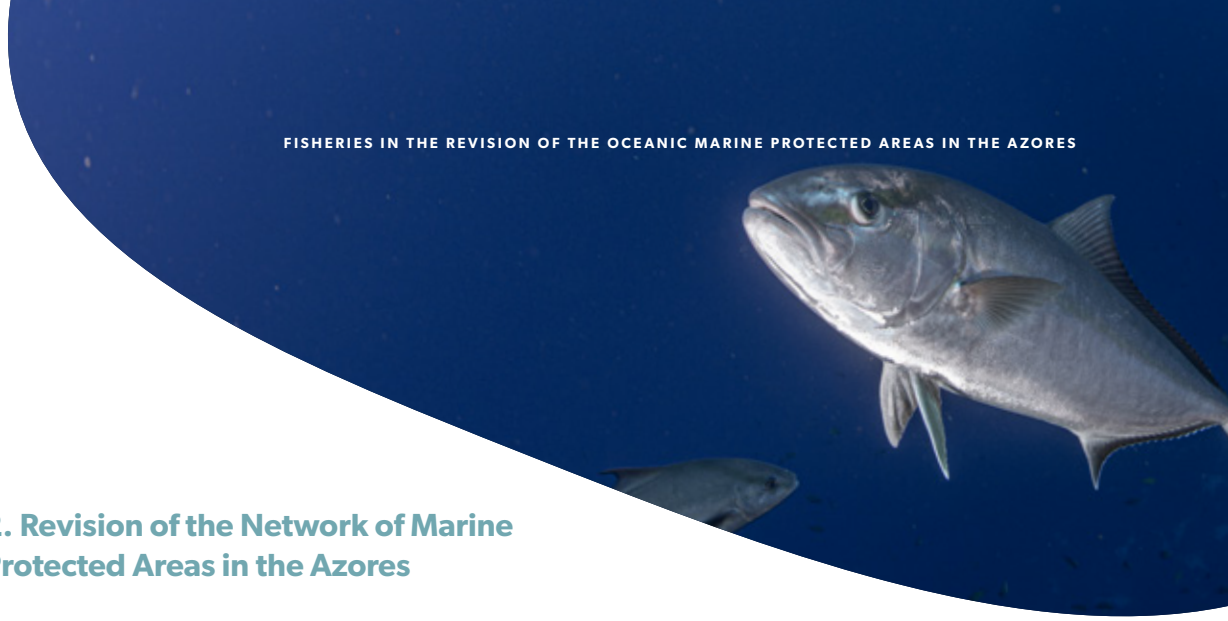
1. Socioeconomic value of the Azores Sea

The main economic activities in the Azores Sea are fishing and tourism. It was estimated in 2017 that the **annual value of fishing represents €31.7 million per year and that maritime tourism represents between €23.5 and 67 million per year** [1].Maritime tourism is growing in importance. More recently, it was calculated that marine ecotourism activities in the Azores generated €80 million for the economy, the equivalent of 2.2% of regional GDP [2]. However, the potential of the Azores Sea to generate economic value by adding value to its natural capital is much higher, for example in the future carbon market[1]. Likewise, the emerging marine biotechnology sector, where marine resources play a vital role, has an estimated global potential of €200 billion in 2030 [3].

1 Study on the economic valuation of marine ecosystem services in the Azores (2017)

2 Ressurreição A. et al. (2022) The value of marine ecotourism for an European outermost region. Ocean and Coastal Management 222 https://doi.org/10.1016/j.ocecoaman.2022.106129

3 https://inovamar.pt/en/blue-bioeconomy-pact



2. Revision of the Network of Marine Protected Areas in the Azores

The Revision of the Azores Marine Protected Areas Network, through the proposal for a second amendment to Regional Legislative Decree No. 28/2011/A, achieves the goal of protecting 30% of the Azores Sea, with 16% corresponding to fully protected oceanic areas, i.e. without extractive activities (9 areas) and 14% being highly protected areas, i.e. where only low-impact activities are allowed (14 areas).

These areas are located outside the territorial sea and do not include the protected areas near the islands. This goal achieves the recommendations of the National Strategy for the Sea, in United Nations Sustainable Development Goal 14, the EU biodiversity strategy for 2030 and the Kunming-Montreal Global Biodiversity Framework.

The protection goals include vulnerable and fragile ecosystems which correspond to systems high in biodiversity, especially the goal **to assure the protection of the Vulnerable Marine Ecosystems (VMEs) in the region**, in accordance with the best scientific knowledge available. This goal is in line with the specific requirements for the protection of the VMEs, as provided for in Regulation (EU) 2016/2336 of the European Parliament and of the Council, of December 14, 2016.

The goal of **assuring the participation of the different interest groups**, particularly from the fishing industry, was also defined throughout the process, as well as the goal of **together creating the network of marine protected areas** to be defined. The **main criterion** was to find solutions making it possible to **maximize conservation goals while minimizing the impact on professional fishing activities**. These solutions were assured at three different times: 1. during systematic conservation planning, where the solutions are aimed at minimizing the impact of bottom fishing; 2. during the participatory process, with the majority adoption of solutions proposed for the fishing sector and the avoidance of areas important for fishing; 3. during the political decision-making process following the public consultation, where some areas were rectified as a result of proposals received from fishing associations.

The Azores Marine Protected Areas Network that has now been revised follows international principles and criteria in terms of the protection levels and categories, particularly those defined by the International Union for Conservation of Nature (IUCN) [4,5,6].

4 https://mpa-guide.protectedplanet.net

5 https://iucngreenlist.org/standard/global-standard/

6 https://portals.iucn.org/library/node/30018

Thus, the commercial and recreational fishing activities allowed in the different protection levels are

TABLE 1. Prohibited and restricted fishing actives, according to the protection level of the marine protected areas

ACTIVITIES	FULL PROTECTION	HIGH PROTECTION	SOME PROTECTION	MINIMAL PROTECTION
FISHING (commercial and recreational)				
Hooks and lines - Surface longline	●	●	●	●
Hooks and lines - Drifting longline targeting black scabbard fish	●	●	●	●
Hooks and line - Bottom longline	●	●	●	●
Gillnets	●	●	●	●
Purse seines	●	●	●	●
Lift nets	●	●	●	●
Pots and traps	●	●	●	●
Lift nets for live bait	●	●	●	●
Purse seines for live bait	●	●	●	●
Spearfishing	●	●	●	●
Hooks and lines - Handline, trolling, jigging, fishing rod	●	●	●	●
Hooks and lines - Pole and line targeting tuna species	●	●	●	●

● Prohibited activities
● Restricted activities with a high level of restrictions
● Restricted activities with a low level of restrictions

3. The involvement of the fisheries sector

In the participatory process that took place between 2021 and 2023, 43 meetings were held on the revision of the Azores Marine Park, **of which 27 meetings were attending by the fisheries sector**, with a total of 17 representatives of the different sectors of activities linked to the sea, which included the Azores Fishing Federation (FPA) and the **main fishing associations in the Azores**.

In this context, a commission of representatives of the different sectors was set up, holding **9 extended meetings and 30 interim meetings**, where the criteria for defining the network of marine protected areas were approved and work was done on the solutions in accordance with the goals defined (Fig. 1).

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OCEANIC PARTICIPATORY PROCESS IN THE AZORES

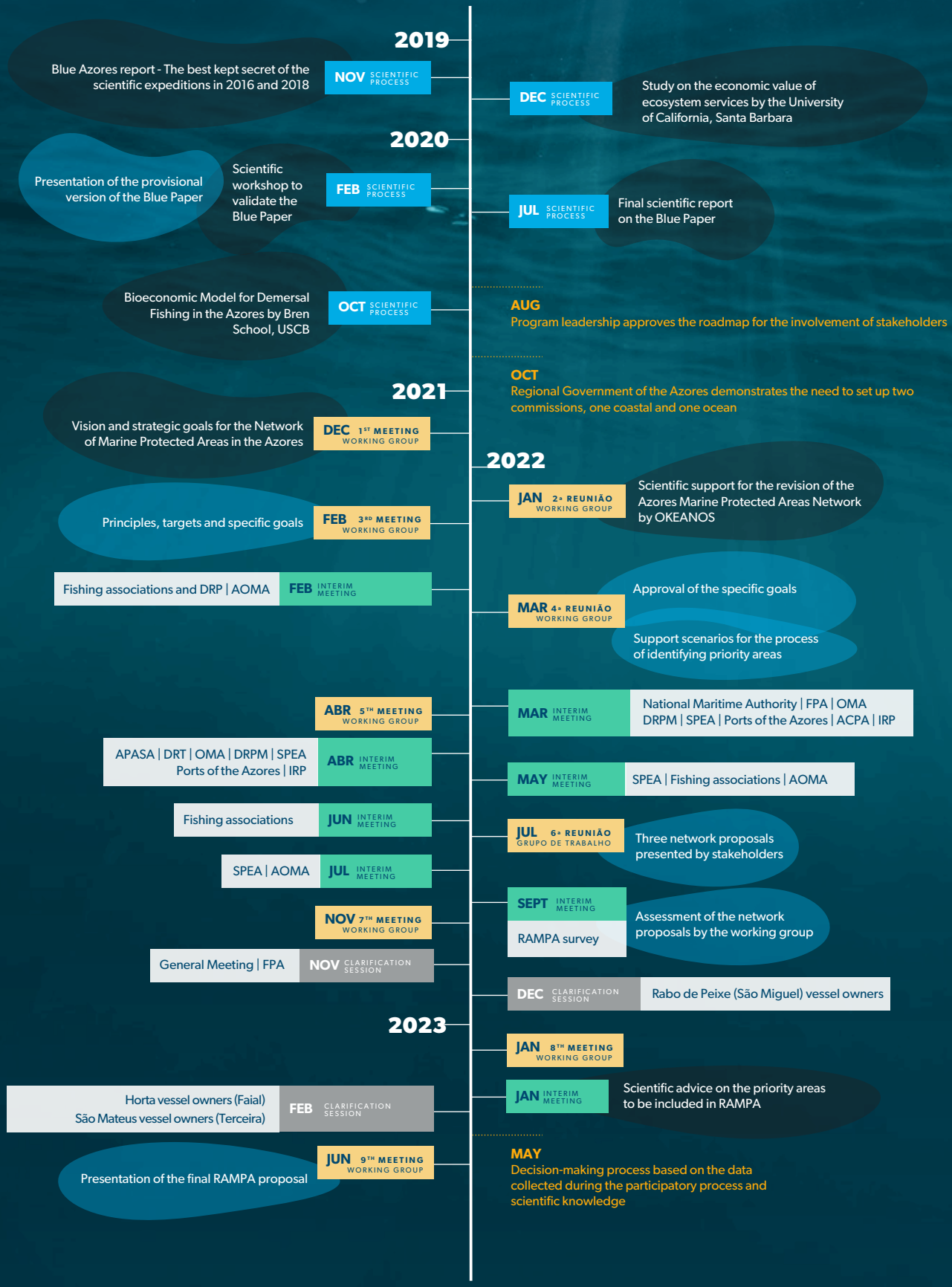

Figure 1. Calendar for the participatory process meetings on the revision of the Azores Marine Park

ACRONYMS

(RAMPA) Azores Marine Protected Areas Network | (USCB) Bren School - University of California, Santa Barbara | (DRP) Regional Directorate for Fisheries | (AOMA) Association of Azores Maritime Operators | (ACPA) Association of Azores Fish Merchants | (IRP) Regional Inspectorate of Fisheries | (APASA) Association of Azores Producers of Tuna and Tuna-Like Species | (DRPM) Regional Directorate of Maritime Policies | (SPEA) Portuguese Society for the Study of Birds | (OMA) Azores Sea Observatory | (FPA) Azores Fishing Federation

Four meetings were also held with the Regional Directorate for Fisheries, the Azores Fishing Federation and several fishing associations, **in order to identify the measures necessary for restructuring the sector.**

The final result of the co-creation process for the network of ocean marine protected areas took into account the minimizing of the impacts on the fisheries sector and the maximizing of the conservation goals defined. **Around two thirds of the total area proposed for protection is the result of proposals presented by representatives of the fishing sector at the meetings (Fig. 2).**

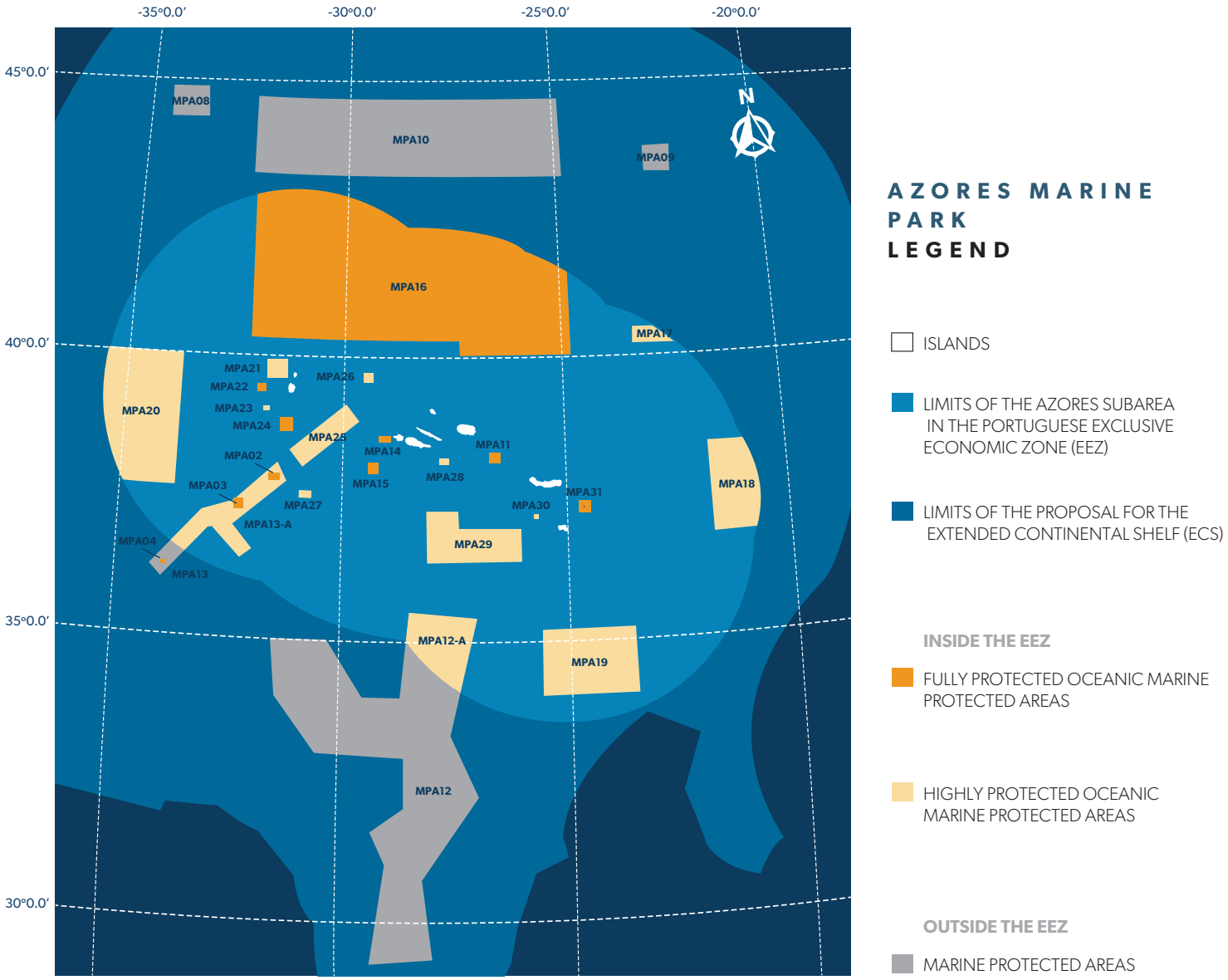

Figura 2. Azores Marine Park Revision Proposal

MPA02 Menez Gwen Hydrothermal Vent Field Natural Marine Reserve
MPA03 Lucky Strike Hydrothermal Vent Field Natural Marine Reserve
MPA04 Rainbow Hydrothermal Vent Field Natural Marine Reserve
MPA08 Altair Seamount Marine Protected Area
MPA09 Antialtair Seamount Marine Protected Area
MPA10 MARNA Marine Protected Area
MPA11 Dom João de Castro Seamount Natural Marine Reserve
MPA12 Meteor Submarine Archipelago Marine Protected Area (ECS)
MPA12-A Meteor Marine Protected Area (EEZ)
MPA13 Resource Protection and Management Perimeter of the Marine Protected Area Located southwest of the Azores (ECS)
MPA13-A Southwest Azores Marine Protected Area (EEZ)
MPA14 Condor Seamount Natural Marine Reserve
MPA15 Princess Alice Seamount Natural Marine
MPA16 North Azores Natural Marine Reserve

MPA17 Northeast Azores Marine Protected Area
MPA18 East Azores Marine Protected Area
MPA19 South Azores Marine Protected Area
MPA20 West Azores Marine Protected Area
MPA21 Albert of Monaco Marine Protected Area
MPA22 Cachalote Natural Marine Reserve
MPA23 North Bugio Marine Protected Area
MPA24 Diogo de Teive Natural Marine Reserve
MPA25 Gigante Marine Protected Area
MPA26 Óscar Marine Protected Area
MPA27 Voador Marine Protected Area
MPA28 Southeast Pico Marine Protected Area
MPA29 Tridente Marine Protected Area
MPA30 South Prata Sea
MPA31 Formigas Islets Natural Marine Reserve

4. Description of the fishing fleet operating in the Azores

Vessels from the regional, national (mainland and Madeira) and European fleets operate in the Azores. The description of the fishing fleet operating in the Azores, focusing on oceanic areas, reveals the following figures [7]:

4.1. Number of vessels and fishers in the Azores in 2022

- Total of 515 licensed fishing vessels and 503 active (with at least one landing per year).
- 71% of the vessels are less than 10 m long and have a limited range of operation.
- 369 are local fishing vessels, this figure has decreased 13% since 2016; and 134 coastal fishing vessels, this figure has increased 4% since 2016.
- There are 1483 registered fishers and there have been no significant changes in this figure in the last five years; almost half of these are from São Miguel island.

4.2. Catches and economic value of the regional fleet

- On average, over the last seven years, around 9,000 metric tons of fish were caught per year, which is equivalent to average annual income of around €33 million.
- Tuna catches represented around 50% of the weight unloaded and around 25% of income, at an average price of €1.70 per kg.
- Demersal fish species are the ones that generate most revenue; alfonsino, blackspot seabream and wreckfish are the species with the highest commercial value, with average prices of around €31.90/kg, €23.50/kg and 21.30/kg, respectively [8].
- Of all the catches landed, 68% are by coastal vessels, which are the ones that bring in most income (~60% of the value).
- Bottom longline vessels were responsible for an average of 16.3% of the catches landed and around 24% of the value of transactions at fish markets in the region in the last seven years.

4.3. Description of the European and national fleets operating in the Azores[9]

- In 2022, at least 125 vessels were registered (using the AIS positioning system); 79 of these were national and 46 were from Spain.
- These vessels were involved in an estimated total of >33,000 hours of fishing, with peak activity in June.
- 50% of the vessels operate with surface and bottom drift longlines.
- 28% of the vessels use pole and line fishing gear.

7 Data from the Regional Directorate for Fisheries

8 Lotaçor (2022)

9 Global Fishing Watch (2022)

5. Overlap between fishing activities and oceanic marine protected areas

Internationally, several studies have shown that **large-scale oceanic marine protected areas do not affect fishing revenue** [10].For example, the expansion of the US National Monuments in the Pacific Ocean had minimal or no economic impact on the fishing industry, with longline fishing catches increasing, even after the implementation of the marine protected areas.

In the Galapagos and Hawaii, these large-scale oceanic marine protected areas **increased the stocks of skipjack, bigeye and yellowfin tuna**, as well as other commercially important pelagic fish, such as squid, butterfish, mackerel and swordfish. In Mexico, management measures such as temporary halts to longline fishing resulted in a rapid increase in the regional abundance of marlin.

These examples show that there is scientific support in international studies for the conservation and management measures associated with the revision of marine protected areas in the Azores.

5.1 Description of the impact of oceanic marine protected areas on the Azorean fleet [11]

Based on the information available in 2022, of the 503 regional vessels with active licenses in the Azores, it is **estimated that less than 15% of the fleet could be impacted** by the revision of the Azores Marine Park. The analysis carried out predicts that around 76 vessels engaged in fishing for demersal species will be affected, generating an impact of 27.5% on the overall effort in fishing hours.

Considering the overlap between the areas where the vessels operate, the type of fishing they engage in and the areas to be protected (Figs. 3, 4 and 5)[12], it is predicted that 45 bottom longline fishing vessels and one vessel engaged in crustacean fishing with traps could suffer more impacts in the immediate term. In the case of surface longline fishing, five vessels could also be impacted, although this type of fishing can move around relatively easily. In the case of vessels operating with handlines, the impact will be minimal, as they will only be affected by fully protected MPAs.

10 Lynham, J. et al. (2020) Impact of two of the world's largest protected areas on longline fishery catch rates. Nat Commun 11, 979 (2020). https://doi.org/10.1038/s41467-020-14588-3

Lynham, J. (2022). Fishing activity before closure, during closure, and after reopening of the Northeast Canyons and Seamounts Marine National Monument. Sci Rep 12, 917 (2022). https://doi.org/10.1038/s41598-021-03394-6d

Santiago J. et al. (2018), Assessing fishing effects inside and outside an MPA: The impact of the Galapagos Marine Reserve on the Industrial pelagic tuna fisheries during the first decade of operation, Marine Policy, Volume 87, 2018, Pages 212-225, ISSN 0308-597X, https://doi.org/10.1016/j.marpol.2017.10.002. (https://www.sciencedirect.com/science/article/pii/S0308597X17303949)

Boerder K. et al. (2017) Interactions of tuna fisheries with the Galápagos marine reserve. Mar Ecol Prog Ser 585:1-15. https://doi.org/10.3354/meps12399

Jensen O.P. et al. (2010), Local management of a "highly migratory species": The effects of long-line closures and recreational catch-and-release for Baja California striped marlin fisheries, Progress in Oceanography, Volume 86, Issues 1–2, 2010, Pages 176-186, ISSN 0079-6611, https://doi.org/10.1016/j.pocean.2010.04.020

11 Based on the fishing licenses registered at the Regional Directorate for Fisheries, analysis of active vessels through landings at the fish market and analysis of the activity of the vessels in the National Data Collection Framework.

12 Based on an analysis of the VMS positioning record of national vessels and vessels from EU member states between 2002-2018

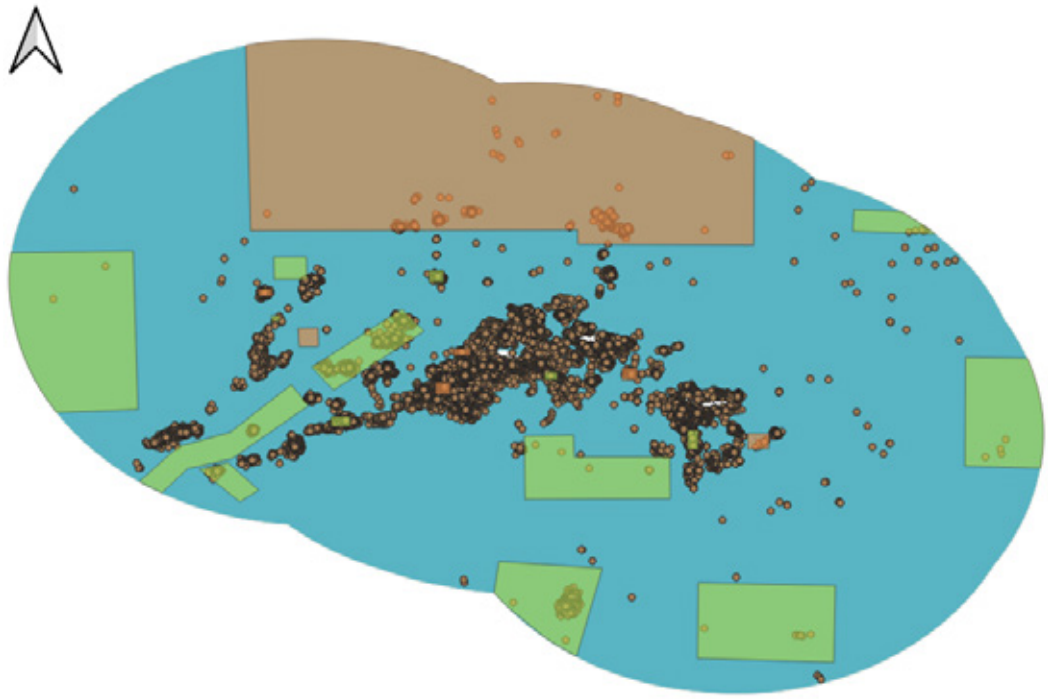

Figure 3. VMS positioning record of regional vessels engaged in pole and line fishing between 2002-2018 in the Azores sea.

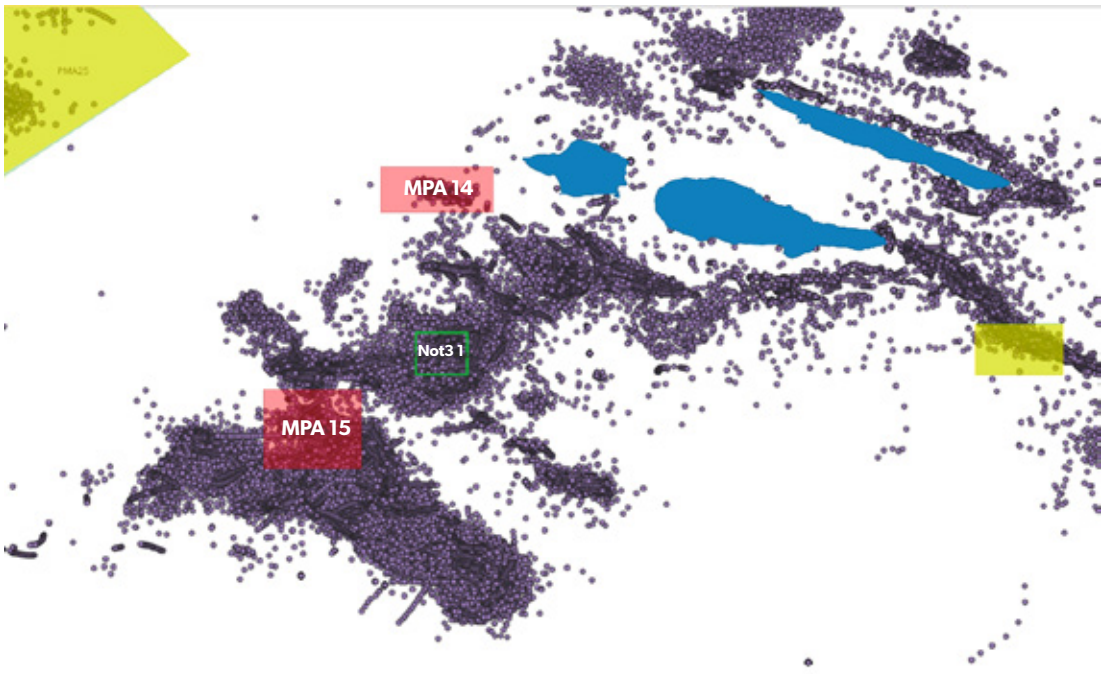

Figure 4. VMS positioning record of regional vessels engaged in bottom longline fishing, between 2002-2018, southwest of the Central Group

Key:

MPA 14: Condor seamount Natural Marine Reserve;

MPA 15: Princess Alice seamount Natural Marine Reserve;

Note 1: Açor seamount area, not included in RAMPA, at the request of the fishing sector, due to its socioeconomic impact.

Figure 5. VMS positioning record of regional vessels engaged in bottom longline fishing between 2002-2018, south of São Miguel island

Key:

MPA 30: South Prata Sea Marine Protected Area. Following the RAMPA public consultation, the coordinates of this MPA were changed from the initial proposal in order to reduce the impact on the fishing effort. This represented a reduction by half of the impact of bottom longline fishing, while fully maintaining the percentage of protection of shallow seamounts;

Note 1: North Prata Sea Bank area, not included in the RAMPA, at the request of the fishing sector, due to its socio-economic impact.

Note 2: Bank 70 area, not included in the RAMPA, at the request of the fishing sector, due to its socioeconomic impact.

5.2 Description of the impact of oceanic marine protected areas on the European and national fleets

With regard to the national and European fleets, **6% of fishing activities took place in the marine protected areas that will be fully protected and 18% in areas with high protection**. In terms of the distance from the coast, 19% of the fishing done by these vessels was in the future marine protected areas between 100 and 200 miles out and 4.5% was in the marine protected areas inside 100 miles. The remaining activities are in fishing areas outside the network of marine protected areas.

6. Implementation of the Azores Marine Protected Areas Network and goals for restructuring the fishing sector

The implementation of large-scale networks of marine protected areas must be accompanied by additional management measures for the restructuring of the fisheries sector in order to maximize conservation goals and minimize direct and immediate impacts on this sector. These measures should promote adding value to natural capital, including fish, as one of the consequences of the protection measures is an increase in stock quantities, recovering these and the economic value of fishing, as well as all the activities associated with a sustainable blue economy.

By analyzing the fishing effort made, using monitoring and surveillance resources, **we have the resources and the ability to determine the efforts of each vessel in each one of the marine areas to be protected**, which makes it possible to define criteria for compensation measures. Based on international best practices, the compensation measures can be determined by taking into account the history of catches per vessel (Fig. 6).

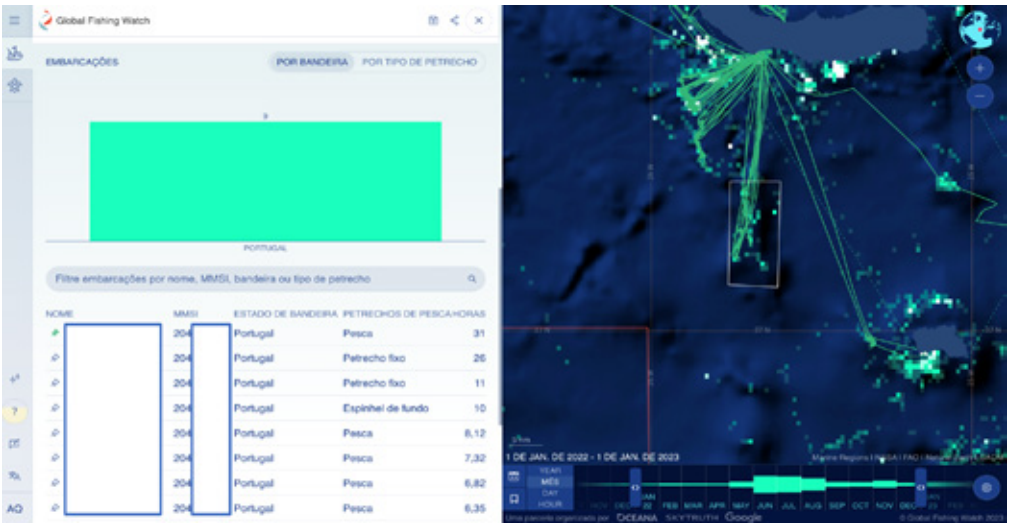

Figure 6. Example of an analysis of the impact of the annual fishing effort by vessel in MPA 30 – South Prata Sea MPA, through the Global Fishing Watch platform. This mission should also be complemented by VMS positioning data, fishing logs and information from fishing associations

The approval of the proposal for the second amendment to Regional Legislative Decree No. 28/2011/A, which promotes the revision of the Azores Marine Protected Areas Network, provides for a period of up to 12 months for the definition of the implementation strategy for the network and another 12 months for the definition of the management plans for the marine protected areas. This period will make it possible to implement the additional management measures for restructuring the fishing sector, including compensation measures, which are essential in order to effectively achieve the vision agreed by all the participants in the revision process for the Network of Marine Protected Areas:

"A healthy, productive and resilient sea, capable of leveraging sustainable economic development and a society that is aware of the importance of the ocean to its well-being, based on an ecologically cohesive, representative RAMPA that protects and promotes the resilience of biodiversity, ecological projects and the scientific potential of the Azores for current and future generations".[13]

Under the scope of the dialogue and the meetings with the fishing sector between 2022 and 2023, **a broad set of potential support measures for the RAMPA implementation process** have already been identified, including the restructuring of the fishing sector. These are listed below:

Financial measures

- **Financial compensation** (direct, based on proven loss of income, calculated per vessel and area of operation, singling out the vessels that will definitely be affected, etc.). There must be clear criteria for identifying the eligible vessels, quantifying fair amounts to be allocated and monitoring the efficiency of the compensation. Principles of the implementation of compensatory measures must include: simplicity, transparency, fairness, temporary nature and the assumption of improvement.
- **Payment for environmental services** (e.g. adding value to products associated with sustainable fishing activities).

13 Vision for RAMPA approved at the third general meeting of the oceanic participatory process, 2/14/2022

Measures for adding value

| **Renovation** of the fleet (in energy, digital and safety terms).
| Support for **entrepreneurship, employment, training and retirement.**
| Support for **converting to alternative activities** to fishing.
| **Certifying and adding value** to regional products and sustainable fishing methods.
| **Construction/improvement of coastal infrastructure.**
| **Improvement in the quality of the fish** sold, for example through promoting fishing, on-board storage and transport methods.
| **Adding commercial value** to species less commonly fished or of low value.

Management measures

| **Effective monitoring and supervision**, based on remote detection methods.
| Development of **alternative fishing activities**.
| **Alternative measures for licensing and/or quotas**.
| Use of **new technologies** in decision-making support tools at sea.
| **Regulatory revision** of activities such as recreational fishing.
| **Adjustment of the fleet** to the sustainable use of the available resources.
| Promotion of the decommissioning of less selective fishing gears.
| **Optimization of first sales** and encouraging alternative methods (online/direct).

With regard to the financial compensation measures, a **process of dialogue, negotiation and joint decision-making should be established with the representatives of the fishing sector**, where different types of scenarios can be defined. Based on processes implemented in other regions and countries, the compensation measures may be through one-off initial compensation, instalment payments over a certain period of time or compensation for proven losses.

It is important to define **information-based mechanisms** for this process, such as:

| Mapping the fleet in the region.
| Quantifying the potential impact of the fishing effort by vessel based on the areas of operation and the history of position and catches/effort.
| Quantifying the average annual income per vessel (selecting the years for the calculation).
| Estimate of the value of the potential loss.
| Establishment of a compensation factor for the relocation of activities.
| Establishment of minimum compensation values.
| Establishment of criteria for allocation and conditions of the compensation.

Additionally, it is important to identify potential **sources of funding** to support the transition and restructuring of the fishing sector, such as those listed below:

| Budget of the Autonomous Region of the Azores
| MAR 2030 (FEAMPA)
| INTERREG MAC (FEDER)
| Recovery and Resilience Plan (PRR)
| Philanthropy
| LIFE program, such as LIFE IP Azores Natura
| Environmental Fund
| Blue Fund
| Local Action Groups (GAL)

The information in this document is to provide support for the decision-making process for the Regional Legislative Decree on the Revision of the Azores Marine Protected Areas Network, as well as the subsequent phases for its implementation, particularly the Network Implementation Strategy, the Definition of the Management Plans for the Marine Protected Areas and the Definition of the Process for Restructuring Fishing in the Azores.

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