

MUSES PROJECT

CASE STUDY 3B: DEVELOPMENT OF TOURISM AND FISHING IN THE SOUTHERN ATLANTIC SEA (AZORES ARCHIPELAGO – EASTERN ATLANTIC SEA)

MUSES DELIVERABLE: D3.3 - CASE STUDY IMPLEMENTATION - ANNEX 6

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Introduction

This report is integrated in WP3 (Case Studies) of the MUSES Project – Multi-Use in European Seas. It presents the case study report for the Southern Atlantic Sea (Azores archipelago), one of the two study areas included in the Portuguese case study. Within this case study, a parallel case study report is also developed for the Southern Atlantic Sea (Algarve region).

1 GEOGRAPHIC DESCRIPTION AND GEOGRAPHICAL SCOPE OF THE ANALYSIS

The Azores is an archipelago composed of nine volcanic islands, located in the North Atlantic Ocean approximately 1500km from mainland Portugal, distributed along 600 km between 37 and 40°N and 25 and 31°W, with c. 2333 km² of emerged land and c. 1170 km of total coastline. The islands are geographically divided into three groups: Western (Flores and Corvo), Central (Graciosa, São Jorge, Faial, Pico and Terceira) and Eastern (São Miguel and Santa Maria) (Figure 1).

São Miguel is the largest island and Corvo is the smallest, with 745 km² and 17 km² respectively. Mount Pico, located on Pico Island, has the highest elevation point (2351 m above sea level) and Graciosa has the lowest (402 m above sea level) (Borges et al., 2009).

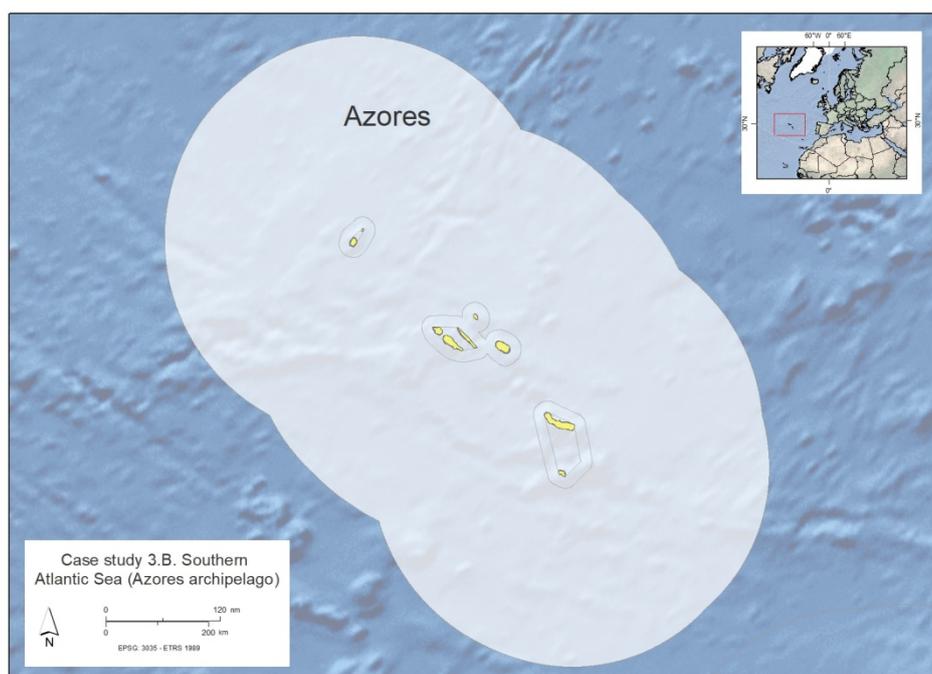


Figure 1 Location of the Azores archipelago and the case study (source: Bocci et al., 2017, MUSES, 2017).

The Azores is a Portuguese autonomous region with a small land area but a relative large Exclusive Economic Zone (EEZ) of approximately 926,149 km² (Marinha Portuguesa, 2017), with no boundaries with other member states' EEZ. Marine areas with depths up to 600m represent less than 1% of the EEZ and areas with depths between 1000m and 1500m represent only c. 6% of the EEZ (Morato et al., 2008a,b).

The Azorean climate is distinctly oceanic, with small variation in the seasonal temperature, high humidity and precipitation (Borges et al., 2009). The archipelago is located on the confluence of the American, Eurasian and African lithospheric plates (Andrade, Borges and Freitas, 2006; Borges et al., 2009), resulting in high volcanic activity typical of a ridge-hotspot interaction (i.e. a hotspot on a slow-moving plate) (Borges et al., 2009) and high vulnerability to natural hazards (e.g. tsunamis, landslides, earthquakes and other volcanic events) (Andrade, Borges and Freitas, 2006). The Azorean plateau is delimited by the bathymetric line of 2000 m, with c. 400,000 km² of total area, defining the transition to the surrounding abyssal plain with more than 3,500 m deep (Needham and Francheteau, 1974; Lourenço et al., 1998).

The islands are surrounded by steep submarine slopes with an absence of shallow shelves, producing localised patterns of wave shoaling, refraction and diffraction. As these processes take place they simultaneously produce breaking waves, especially during storms (Borges, Andrade and Freitas, 2002; Borges, 2003). The Azores has a high-energy wave climate where both sea and swell contribute to coastal energy, caused by extensive fetch length in the surrounding ocean (Borges et al., 2002).

The temperature of surface sea water varies seasonally in the Azores as a result of the changes in the general patterns of ocean circulation and are generally consistent all year round (Souto, 2005). The Azorean tides are semi-diurnal and tidal amplitude is lower than 2 m (Morton, Britton and Martins, 1998).

The thermoregulatory capacity of the surrounding ocean has enabled the archipelago to retain a large part of their ancient vegetation and marine biodiversity (Petit and Prudent, 2008). Due to the isolated position of the archipelago in the middle of the Atlantic Ocean, which allows marine biodiversity to present a mix of characteristics of cold, temperate and tropical climates (Tittley & Neto, 1995; Ávila, 2000a, 2005 fide Botelho, 2013), the Azorean marine environment is of biological, biogeographic and conservationist interest (Briggs, 1974; Ávila et al., 2008 fide Botelho, 2013).

In the Azores, a protected areas network is organized in Island Natural Parks (INP) – one per island, including terrestrial areas and maritime areas up to the outer limit of the territorial sea – and a Marine Park – including classified marine areas, organized in a single management unit, located beyond the outer limit of the territorial sea (Regional Legislative Decree 15/2012/A) (Figure 2). Classified marine areas inside the limits of the territorial sea are established and ruled in each INP legal document (e.g. Regional Legislative Decree 20/2008/A creating Island Natural Park of Pico Island) and classified marine areas beyond the limits of the territorial sea are ruled by the Regional Legislative Decree 28/2011/A, amended by the Regional Legislative Decree 13/2016/A that classifies new marine protected areas in the Azores (MPAs).



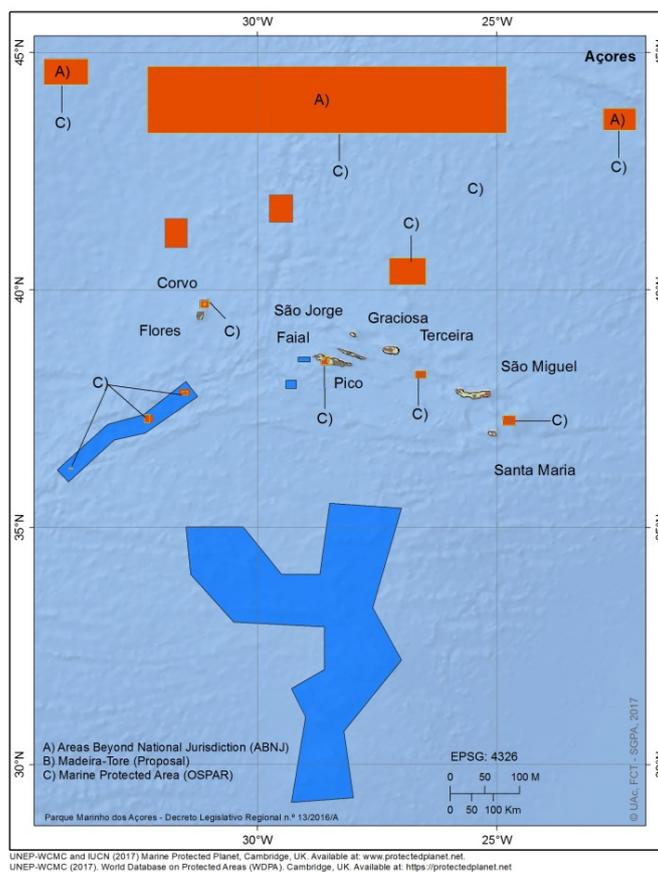


Figure 2 Marine Protected Areas in the Azores (source: info from UNEP-WCMC (2017), MUSES, 2017)

The main pressures, impacts and threats to the marine environment identified for Azorean seas include direct physical losses and damages on the coastal zone and bottoms; sound and noise resulting from anthropogenic activities; accumulation of solid waste (litter); anthropogenic changes in circulation patterns (hydrography and hydrology); contamination by hazardous substances in ecosystems; nutrient enrichment and the introduction of pathogenic microbes and non-indigenous species; as well as the selective extraction of species of economic interest (SRMCT, 2014).



2 CURRENT CHARACTERISTICS AND TRENDS IN THE USE OF THE SEA

With a population of 246,772 inhabitants in 2011 (INE, 2011), in the Azores most settlements, transportation infrastructures and economic activities are located in coastal areas, mainly due to the dependence on the sea as the most important communication route and to the geological, geomorphologic and climatic constraints of the islands (Porteiro et al., 2005). The economy in the Azores is mainly based on small domestic markets, which depend mostly on biodiversity and natural resources (Calado et al., 2014). Agriculture, especially milk production, cattle grazing, fisheries and tourism are the most important economic sectors (Petit and Prudent, 2008; Calado et al., 2014).

The Azores has always been a strategic crossing point in the Atlantic. Nowadays it continues to be a crossing point for maritime traffic, commercial shipping, cruises or even yachting. Due to its location in the middle of the North Atlantic Ocean, transportation has long been one of the main uses of the Azorean seas. The network of ports in the Azores includes infrastructure, facilities and equipment that allow the movement of passengers and goods between land and maritime transport for commercial, industrial, tourism and leisure activities and fisheries (Regional Legislative Decree 24/2011/A; Botelho, 2013). This network includes ports with different categories (A to E) depending on the functions: (A) commercial warehouse; (B) commercial supporting the economic activity of the island; (C) small market, passenger transport and support to fisheries; (D) exclusively supporting fisheries and (E) small dimension, designated as “Portinho”, without any of the specific functions provided for in the other classes (Regional Legislative Decree 24/2011/A). The Azores also has some marinas and recreational ports and conditions in Ponta Delgada – the main city of the archipelago – to harbour cruise ships. The Azores have great potential to become a logistic hub in the Mid-Atlantic (European Commission, 2017a). Its geographical position is an advantage for catching international shipping flows and developing transshipments facilities, serving as a platform for cargo distribution. Maritime passenger transport also has growth potential, especially due to the growth of coastal tourism (European Commission, 2017b).

Fisheries and tourism are two main economic drivers in the maritime economy of the region and the Azorean Government is committed to continue to encourage and support the development of these activities in the Azores. The three main pillars for the Azorean priorities, regarding the Research and Innovation Strategies for Smart Specialization (RIS3) under the Europe 2020 strategy framework, are (i) agriculture, livestock and agroindustry; (ii) fisheries and sea; and (iii) tourism (SPI Açores, 2014).

Fisheries in the Azores have been an activity of great economic, social, cultural and political importance for decades. It accounts for around 2% of the archipelago’s total gross domestic product (GVA) and 3% of regional employment in 2014 (European Commission, 2017b). In 2012, the number of registered fishers in the Azores was above 5000, including workers inland supporting the at-sea activity. Auxiliary industries and specifically, the canning industry, adds thousands more jobs (Paramio et al., 2013). Fishing as an economic activity accounts for 1.7% of the active population in the Region and a large part of exports (INE, 2013). However, this exploitation of the sea resulted in a decline in stocks due to over-exploitation of fishing resources and mismanaged patterns of exploitation by both national and international fleets (Botelho, 2013). In the Azores, similar to the mainland Portugal, fisheries are regulated according to the Common Fisheries Policy. The Regional Legislative Decree 29/2010/A, amended by the Regional Legislative Decree 31/2012/A, regulates the exercise of fishing and maritime activity and defines measures appropriate to the specific characteristics of the maritime territory of the Azores. Fisheries in the Azores are additionally ruled by the Council Regulation (EC) 850/98, regarding the conservation of fishery resources through



certain technical measures for protection of juveniles of marine organisms, amended by the Council Regulation (EC) 1568/2005, regarding the protection of deep-water coral reefs from the effects of fishing in certain areas of the Atlantic Ocean. The latter prohibit vessels “from using any gillnet, entangling net or trammel net at depths greater than 200 metres and any bottom trawl or similar towed nets operating in contact with the bottom of the sea in” some areas, including the Azores. The Azorean sectorial vision defined in the RIS3, states that by 2020, the Region will see its position reinforced as an intercontinental platform in the field of ocean knowledge, contributing actively to the economic development of the region through the strengthening of traditional activities (like fishing) and the emergence of innovative activities (SPI Açores, 2014).

The archipelago is a recent growing tourism destination. Tourism in the region is mainly nature-oriented, including activities developed in the sea, such as recreational boating, diving, whale watching, geotourism, volcanological tourism, bird watching, surf, golf, hiking and trekking (European Commission, 2017b). Maritime touristic activities have been increasing in recent years and are today one of the hallmarks of tourism in the Azores and one of the main products that contribute to the strengthening of the Region's reputation in the national and international markets (Botelho, 2013). These activities are ruled in the Azores by the Regional Legislative Decree 23/2007/A. According to this regulation, maritime tourist activities include: maritime-tourist tours, whale watching, diving and snorkelling , shark dive watching, tourist fishing, fishing-tourism (when on fishing vessels), submersible excursions, renting of vessels with or without crew, maritime taxi, services of a maritime-tourist nature provided by the use of moored or anchored vessels and without their own or sealed means of locomotion, rental of water scooters and small boats and other services (e.g. towing services for recreational equipment). In relation to fishing-tourism regulation, the Azorean Government has created additional and specific legislation, publishing the Regional Legislative Decree 36/2008/A. Tourism is still an emerging sector, already very important in the regional economy but presenting a high potential to increase. This sector has been considered as a strategic priority for the development of the regional economy, having strong impacts on direct and indirect income generation and employment. There is potential for nature tourism, rural tourism, nautical tourism and cruise tourism (European Commission, 2017b). The Azorean sectorial vision defined in the RIS3, states that by 2020, the Region will be recognized as an Excellency Destination for specific market segments, in which regional stakeholders will be able to structure a qualified offer, promoting the sustainable use of the distinctive features of the region (SPI Açores, 2014).

In order to accomplish the Azorean vision defined in RIS3 for the sea, some actions were defined and integrated in the strategic priority regarding strengthening the position of the Azores as an intercontinental platform in the area of knowledge about the oceans, namely promoting research in aquaculture, especially with regard to species in which the Region may present greater competitive advantages; strengthening research on current issues with medium-term economic potential, including biotechnology and the exploration of deep ocean mineral resources; and ensuring monitoring of the environment, aimed at the sustainable exploitation of Atlantic marine resources (SPI Açores, 2014).

Aquaculture is not yet developed in the Azores, mainly due to the natural and weather conditions being unfavourable for the offshore activity despite some projects that are currently emerging. There is an internal growing demand for seafood and interest in investing in this area (European Commission, 2017b). The first Azorean project is being installed in Graciosa Island, a unit production



of spirulina – a micro-algae used in the food industry – and other three projects, in Terceira, Faial and São Miguel Islands, are under evaluation (Costa, 2017). However, the Azorean Government is committed to enabling the development of this activity and has created tools to encourage the implementation of this industry in the archipelago in line with the European guidelines, defined in the Regulation (UEE) 508/2014, which creates European Maritime and Fisheries Fund. Such measures include supporting several research projects by the University of the Azores in this area (e.g. a scientific study in 2015 that mapped onshore and offshore areas with more potential to install aquaculture structures in the archipelago, as well as the risks associated with this activity); reducing the minimum amount of investment necessary for projects in aquaculture productive units to receive tax benefits to €200,000; and the creation of a support system for Scientific Research Projects in Business Context (República Portuguesa, 2017). Complementarily, regional legislation has also been created to regulate the activity in the Azores, through the Regional Legislative Decree 22/2011/A.

Similarly to aquaculture activity, in the Azores natural and weather conditions hinder the development of marine energy. There is no marine wind energy and the only case of wave energy is a pilot wave energy plant, installed on Pico Island, which was the first in the world to be connected to an electricity distribution network (European Commission, 2017a). One of the initial project ideas was to demonstrate the viability of producing electricity for a small grid, mainly because this type of plants can be particularly interesting for remote locations, like islands (WaVEC, 2017). However, the scenario is similar to mainland Portugal where marine renewable energy seems not to be competitive even in the long term, since revenues from electricity sales are still insufficient to offset capital costs (Açoriano Oriental, 2017).

Scientific research also has potential to increase in the Azores and the Regional Government intends to strengthen the positioning of the Region as a platform of knowledge on the themes of the sea and volcanology. The Azores has relevant scientific resources on the themes of the sea, with recognized research centres at the University of the Azores and in cooperation with European and international research projects (Paramio et al., 2013; SPI Açores, 2014). It is also an objective of the Azorean Government to strengthen the positioning of the Region as an intercontinental platform for monitoring the Atlantic, in areas such as biodiversity, ecology of marine ecosystems, ecotoxicology, fisheries and the sustainable use of the oceans and marine technology for exploration of the deep ocean, which have been the focus of research developed in the Azores (SPI Açores, 2014). It is worth referring the “Galway Statement on Atlantic Ocean Cooperation”, signed on 24th May 2013, a Research Alliance signed by the European Union, Canada and the United States of America and the opportunities that might arise from this cooperation for the Azores. The agreement is focused on aligning the ocean observation efforts of the three partners, aiming at better understanding of the Atlantic Ocean and promoting the sustainable management of its resources. Areas identified for potential cooperation under the agreement include ocean observation, sustainable management of ocean resources and seabed and benthic habitat mapping (European Commission, 2013; SPI Açores, 2014).

The seafloor of the Exclusive Economic Zone of the Azores has an important number of sulphides, crusts and polymetallic nodules. However, there is no exploitation of deep sea mineral resources to date. Their exploration is still in an initial phase, where plans for prospecting studies are in place (European Commission, 2017b).



3 MU OVERVIEW

The use of the sea in the Azores, despite the long relationship of communities with this natural resource, has been mainly based on “soft” and traditional activities, such as fisheries, tourism and transports. “Hard” uses of the sea, such as marine renewable energy or even aquaculture have not been on the agenda until recently, especially aquaculture. Even now, there still remain contradictory opinions on the viability of the development of these single uses, mainly due to natural and weather conditions of the middle of the Atlantic. Therefore, despite the existence of some combinations of uses, the concept of multi-use (MU) in the Azores is not yet implemented and not well known.

Existing MU in the Azores are mainly related to “soft” or traditional uses of maritime space, such as fisheries associated with tourism or tourism associated with underwater cultural heritage (UCH) and environmental protection or scientific research associated with tourism. Therefore, MU consists mainly of combinations of geographical, human and biological resources. Available information about MU in the Azores is limited. Several steps were undertaken to overcome the lack of information, mainly based on desk analysis and stakeholders engagement.

3.1 Desk research

Desk research was defined to be the starting point for the analysis and for this case study included analysis of past or on-going projects related to MU, scientific literature or other available literature on the themes. Screened projects potentially referring to MU and having scope in Portugal did not mention the Azores (Vergilio, Calado and Caña Varona, 2017). The two screened projects that included case studies in the Azores were the Atlas Project and the European OWC Wave Power Plant (Table 1). Atlas is a European Horizon 2020 research and innovation project, intending to provide essential new knowledge of deep ocean ecosystems in the North Atlantic and no direct reference was made to MU. The North coast of Pico Island was chosen for implementing the wave power plant due to the presence of high energy levels, well developed gully and at the same time suitable water depths in front of the plant and good access from local roads. The project, co-funded by the EC, aimed at demonstrating the technical viability of wave energy in a small island grid. After construction, several technical problems and lack of funding to address them resulted in the interruption of the project lasting several years and, in 2003, WavEC Offshore Renewables took over responsibility of the plant. The first test ran in 2005 revealing the persistence of serious technical limitations of the original structure of the turbo-generation group and, ever since, several other problems appeared, despite successful tests conducted from September to December 2010 (WaVEC, 2017). Currently, solutions to the pilot plant are being discussed.

Table 1 Screened projects (data for MUSES, 2017)

	Atlas	OWC Pico Power Plant
Project title	A Trans-Atlantic assessment and deep-water ecosystem-based spatial management plan for Europe	European Wave Energy Pilot Plant
Leader and involved actors	University of Edinburgh (Scotland, UK) and 24 beneficiaries (12 universities, 5 small and medium sized enterprises, 3 government agencies and 4 national research centres) from 11 countries	
Type of project	EU Horizon 2020 research and innovation project	



	Atlas	OWC Pico Power Plant
Start	May 2016	1992
End	April 2020	Construction was concluded in 1999 Several technical problems and lack of funding to address them after construction caused interruption of the project lasting several years. In 2013 some activities at the Pico plant were able to be funded
Aim	Provide essential new knowledge of deep ocean ecosystems in the North Atlantic	Demonstrate the technical viability of wave energy in a small island grid
MU combination	No direct reference to MU	No direct reference to MU
Scope	Marine ecosystems	Wave energy production
Demonstration /pilot activities	Case study in the Azores	Pilot plant in the Azores (Pico Island)
Location	North Atlantic	Small Island grid

Desk research included the analysis of the main legal and policy documents regarding MU, single uses and activities in the maritime space of the Azores and of national scope, such as Maritime Spatial Planning (MSP), sectorial legislation, and other relevant documents. Examples of these are listed below:

National scope:

- National Ocean Strategy for 2013-2020
- Law 17/2014 basis for the Policy of Planning and Management of the National Maritime Space
- Maritime Spatial Plan (POEM)
- Situation Plan of the Maritime Spatial Plan (PSOEM)

Regional scope:

- Marine Strategy for the Azores exclusive economic zone
- Regional Legislative Decree 24/2011/A (Azorean ports network)
- Regional Legislative Decree 29/2010/A, amended by Regional Legislative Decree 31/2012/A (regulates the exercise of fishing and maritime activity in fishing)
- Regional Legislative Decree 23/2007/A (regulates maritime touristic activities)
- Regional Legislative Decree 36/2008/A (regulates fishing-tourism activity)
- Regional Legislative Decree 22/2011/A (regulates aquaculture activity)
- Regional Legislative Decree 13/98/A (defines and characterizes regional whaling heritage)
- Regional Legislative Decree 27/2004/A, amended by Regional Legislative Decree 8/2006/A (legal regime for the management of archaeological heritage)

Among these documents, only Regional Legislative Decree 36/2008/A is focused on a combination of maritime uses.

Portugal has developed several policy documents aiming at regulating Portuguese maritime space. The Portuguese Government currently has a National Ocean Strategy (PG, 2013) and a Maritime Spatial Plan (POEM) (DGPM, 2017a). The National Ocean Strategy for 2013-2020 is the policy



instrument for the sustainable development of the economic sectors related to the sea (PG, 2013), based on the “Blue Growth” paradigm. The Action Plan (Plan Mar-Portugal), defined in the Strategy, aims to promote the economic, social and environmental enhancement of national maritime space through the execution of sectorial and intersectorial projects.

Maritime Spatial Planning (MSP) is also relatively recent in Portugal, with main actions driven by the MSP framework and the National Ocean Strategy developed during the last decade (Santos, 2016). No direct references to the development of MU are made in Portuguese legislation. However, the concept and the MU vision are inherent in the interpretation of the Law that approves the bases for the Policy of Planning and Management of the National Maritime Space (Law 17/2014). In its article 11^o, where conflicts between uses or activities are regulated, this **Law states that priority** is to be given to uses or activities with higher social and economic advantages for the countries; **or to be given to those maritime uses that present the maximum coexistence of uses or activities**. Despite this legal document, remaining legal framework is mainly focused on sector development of individual uses and activities.

The Portuguese Situation Plan of the POEM (PSOEM) promotes compatibility between uses or activities, contributing for a better and higher economic exploitation of the national maritime space. PSOEM is also the instrument that defines how private citizens may use maritime space, allowing the national administration to issue the permits for use of public maritime space, called Titles for the Private Use of the National Maritime Space (TUPEM) (PSOEM, 2017). Portugal has also developed a one-stop-shop for all maritime uses and activities. Licensing is centralized in one single online platform, however, sometimes it is more difficult for investors to follow the process, as different entities analyse the process. Portugal created the Blue Fund (Fundo Azul) – the Fund’s aims include developing the blue economy and supporting scientific and technological research, through the creation or strengthening of funding mechanisms for entities, activities or projects that meet these objectives (DGPM, 2017b; Vergílio, Calado and Caña Varona, 2017).

Portugal has also approved a Marine Strategy for the Azores exclusive economic zone (SRMCT, 2014) but, similarly, does not make reference to MU in the Azores.

The Azores, as a Portuguese Autonomous Region, has the power to adapt national legislation or to create its own regional legislation. This is also applicable, according to the limitations imposed by the National Government, to the development of the Azorean MSP. The Azores, together with Madeira and Canary Islands, got a European funded project to develop MSP for the Macaronesian Region approved. This might be an opportunity for the Azores to explicitly include the MU concept in the exploitation and management of the maritime space.

Focused on single uses of the sea, the Azorean Government has also created regional legislation, as mentioned on section 2, namely for fisheries, maritime tourism activities and aquaculture. The only MU with specific legislation in the Azores is the combination of Fisheries & Tourism (Regional Legislative Decree 36/2008/A), which will be further analysed.

The Azorean Government Agencies are divided into several regional secretariats and directorates. The Regional Secretariat for the Sea, Science and Technology includes the Regional Directorate for Fisheries, the Regional Directorate for Maritime Affairs, the Regional Fisheries Inspection, Regional Directorate of Science and Technology, Regional Fund for Science and Technology. Most activities developed in the maritime space are licensed by this Regional Secretariat. Licensing of activities related to fisheries, as well as Fisheries & Tourism is responsibility of the Regional Directorate for



Fisheries, while licensing of remaining maritime activities (e.g. wildlife tourism, water or inerts extraction and access to natural resources for scientific purposes) is responsibility of the Regional Directorate for Maritime Affairs, although transport is a main responsibility of the Regional Transport Agency.

3.2 Stakeholder engagement

Stakeholder engagement was defined to be one of the main sources of information in the MUSES project (Zaucha et al., 2016) and was the main source of information in the sub-case study of the Azores archipelago. As MU in the Azores are not well known or are barely implemented, great efforts were made to gather as much information as possible during interviews, according to stakeholders' knowledge on the MU and their time availability. Interviews performed included three or four main parts: presentation of the MUSES project and identification of the stakeholder (including signing the MUSES consent form, identification of MU and analysis of existence or potential existence, identification of drivers, added values, barriers and negative impacts (DABI) of the implementation of the MU and, mainly in the cases of cross-cutting stakeholders, presentation of key evaluation questions.)

Based on the analysis resulting from WP2 (Overview of Sea Basins) of the MUSES project for the Portugal country report (Vergilio, Calado and Caña Varona, 2017), and on the desk research of WP3 for the Azores archipelago, a total of 12 combinations of uses were pre-identified for the analysis. These MU were presented to stakeholders separated into two categories - those considered as MU currently in place and those having potential to be developed in the Azores (Table 2).

Table 2 Current and potential MU pre-identified in the Azores (data for MUSES, 2017)

Current MU	Potential MU
Fisheries & Tourism and Recreation	Scientific Research & Defence
Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection*	Blue Biotechnology & Environmental Protection*
Tourism and Recreation & Environmental Protection*	Renewable energy & Environmental Protection*
Scientific Research & Environmental Protection*	Renewable energy & Fisheries
	Renewable energy & Tourism and Recreation
	Renewable energy & Aquaculture
	Aquaculture & Tourism and Recreation
	Aquaculture & Environmental Protection*

* Conservation is a "use" in the sense that sufficient value is attributed to conserved resources that placing restrictions on other possible uses is consider or in place

The list of pre-identified MU was reviewed by interviewed stakeholders, who were asked to identify which ones are currently present and which ones are potential MU in the Azores. Additional MU could be added to both lists, according to their local knowledge. Table 3 shows the responses given by stakeholders to the pre-identified MU as current or potential MU, together with new added combinations. Green shows MU considered as being currently in place while orange means MU perceived as potential in the future. Final status – the final consideration of the use to be existing, non-existent or potential – of the MU reflects the responses given by stakeholders and the analysis, when applicable, of justifications of each one.

Three additional MU were identified/suggested by stakeholders: Tourism and Recreation & Whale heritage, Scientific Research & Fisheries and Scientific Research & Tourism and Recreation. The



name of the pre-identified combination Renewable energy & Tourism and Recreation was changed, by suggestion of the stakeholder to “Renewable energy & Tourism and Recreation & ID”, since it would probably include tourism and innovation and development (ID). The status of these three MU was considered as suggested by stakeholders.

The MU Fisheries & Tourism and Recreation, Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection, Tourism and Recreation & Environmental Protection, Scientific Research & Environmental Protection and Blue Biotechnology & Environmental Protection were considered as currently existing in the Azores as most stakeholders confirmed and identified at least one case of implemented cases.

Regarding MU Scientific Research & Defence, opinions differ between the three possible statuses. It is not easy to get consensus about the definition of this combination (what might have resulted in the referred disagreement). However, this MU was considered as existent as it is known that there is collaboration between the Portuguese Navy (UAc, 2017), specifically between the Hydrographic Institute, and the University of the Azores. The Hydrographic Institute is an institution of the Portuguese Navy aiming to develop science and technology related to the sea, mainly for military purposes and defence of the marine environment. This institute develops activities related to physical oceanography, marine geology, chemistry, hydrography, navigation and environmental protection (Instituto Hidrográfico, 2017). The Navy and the University of the Azores recently co-organized a public session to disseminate the scientific works carried out in the summer of 2017, in the Azores, by the Portuguese navy ship D. Carlos I. During that campaign, the navy hosted onboard a few researchers from the University of the Azores and Navy resources were shared to accomplish both Navy and University objectives. Both parties also publicly assumed the interest in continuing and deepening the synergies.

As mentioned before, the natural and weather conditions of the Atlantic worsen the difficulties of implementing marine renewable energies in the Azores. Additionally, as mentioned by one of the stakeholders, it is easier to install energy production units inland than offshore and trends on demand of energy might be satisfied with those types already installed (e.g. geothermal, eolic and hydric inland) and offshore energy production will hardly be developed in the Azores in the near future. Thus, combinations including renewable energy – Renewable energy & Environmental Protection, Renewable energy & Aquaculture and Renewable energy & Fisheries – were considered as neither existent nor having potential to be developed. An exception was made to the combination of Renewable energy & Tourism and Recreation & ID, because of the pilot wave energy plant, installed on Pico Island. The same stakeholder noted that the Azorean Government will have to decide what to do with it and two options are possible: decommissioning, as it is not currently economically viable, or create a live lab opened to tourism visitation. For this reason, this combination was considered as potential in the Azores.

The combination of Aquaculture & Environmental Protection was identified by one stakeholder as existent, however, this was referring to an existing project that will be installed. Despite differences between opinions regarding the ability of Azorean seas to have aquaculture, the combination was considered as potential, as there are actually projects implemented to test aquaculture in the Azores, namely in Terceira, Graciosa and São Miguel Island.



At the end, among the 15 identified MU, 12 combinations were considered as existing or having potential to be developed in the Azores (eight combinations were considered as already existing in the Azores and four combinations were considered as potential to occur in the future).

Table 3 Overview of responses given by stakeholders regarding existence or inexistence of MU in the Azores and final status considered (SH: stakeholder; green: existent; orange: with potential; grey: neither existent nor having potential/stated by stakeholders; *new added combination) (data for MUSES, 2017)

Combination of uses	SH 1	SH 2	SH 3	SH 4	SH 5	SH 6	SH 7	SH 8	SH 9	SH 10	SH 11	SH 12	Final Status
Fisheries & Tourism and Recreation	Green	Grey	Green		Green	Green	Green	Green		Green	Green		Green
Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection	Green	Grey	Green		Green				Green		Green		Green
Tourism and Recreation & Environmental Protection	Green	Grey	Green		Orange			Orange			Green		Green
Scientific Research & Environmental Protection	Green	Grey	Green		Orange			Orange			Green		Green
Scientific Research & Defence		Grey	Green		Orange						Grey		Green
Blue Biotechnology & Environmental Protection	Green	Grey	Green		Orange						Green		Green
Renewable energy & Environmental Protection	Orange	Grey	Grey	Grey	Orange						Grey		Grey
Renewable energy & Fisheries	Orange	Grey	Grey	Grey	Orange						Grey		Grey
Renewable energy & Tourism and Recreation & ID	Orange	Grey	Grey	Orange	Orange						Grey		Orange
Renewable energy & Aquaculture	Orange	Grey	Grey	Grey	Orange						Grey		Grey
Aquaculture & Tourism and Recreation	Orange	Grey	Grey	Grey	Orange	Orange		Orange			Grey		Orange
Aquaculture & Environmental Protection	Orange	Grey	Grey	Grey	Orange						Green		Orange
*Tourism and Recreation & Whale heritage									Orange				Orange
*Scientific Research & Fisheries		Green											Green
*Scientific Research & Tourism and Recreation		Green										Green	Green

Each stakeholder analysed DABI factors for one or more MU identified in the Azores (Table 4), depending on individual knowledge and/or time availability. Out of the 12 MU identified as existent or potential, eight have been analysed by stakeholders: Fisheries & Tourism and Recreation (seven DABI analysis), Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection (three DABI analysis), Tourism and Recreation & Environmental Protection (two DABI analysis) and Scientific Research & Environmental Protection, Renewable energy & Tourism and Recreation & ID, Tourism and Recreation & Whaling Cultural Heritage, Scientific Research & Fisheries and Scientific Research & Tourism and Recreation (one DABI analysis). Despite results on the final status of MU, and current importance of blue biotechnology and aquaculture in the Azores, remaining combinations were not analysed by any stakeholder to identify DABI factors and assign the scoring.

Based on the status of the MU and the existence of analysis of the MU, Table 4 also reflects the order of importance of MU in the Azores. The number of analyses of DABI factors for each MU was here considered as representative of the importance of the MU for the case-study. The three combinations with more DABI factor analyses and that will be further analysed in detail in sections 4 and 5 are Fisheries & Tourism and Recreation, Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection and Tourism and Recreation & Environmental Protection. Combinations with one DABI factor analysis or with some importance for the Azores (despite not



having DABI factors identification) will be shortly presented in the following section 3.3. Detailed DABI factors identification and detailed scoring are presented in Appendix 1.

Table 4 Number of analyses from stakeholders of DABI factors (drivers, added values, barriers and impacts) per MU and order of importance (SH: stakeholder; green: existent; orange: with potential; grey: neither existent or having potential/stated by stakeholders) (data for MUSES, 2017)

MU	Final Status	Number of DABI analysis
Fisheries & Tourism and Recreation	Green	7
Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection	Green	3
Tourism and Recreation & Environmental Protection	Green	2
Scientific Research & Tourism and Recreation	Green	1
Scientific Research & Environmental Protection	Green	1
Scientific Research & Fisheries	Green	1
Renewable energy & Tourism and Recreation & ID	Orange	1
Tourism and Recreation & Whaling Cultural Heritage	Orange	1
Scientific Research & Defence	Green	0
Blue Biotechnology & Environmental Protection	Green	0
Aquaculture & Environmental Protection	Orange	0
Aquaculture & Tourism and Recreation	Orange	0
Renewable energy & Environmental Protection	Grey	0
Renewable energy & Fisheries	Grey	0
Renewable energy & Aquaculture	Grey	0

3.3 Relevant MU combinations

This section presents the combinations of uses identified for the Azores, with focus on the regional particularities relevant for this sub-case study. Information presented in this section results from desk analysis and interviews performed with stakeholders engaged with the MUSES project.

Fisheries & Tourism and Recreation

It is difficult to define when the combination of Fisheries & Tourism and Recreation was first developed, but the concept “Pescaturism” was defined by the Italian Government, in 1982. It was spread mainly around Mediterranean countries. It is important to note that Pescaturism is different from recreational fishing, because while the first one is defined as the tourist on board a fishing vessel for leisure, the second usually does not involve traditional fishers. For fishers, Pescaturism is an opportunity to show and maintain their culture, as well as for public awareness about problems of the fishery sector. Although, these benefits exist only if the licence right is given to fishers and not to a tourist company (Piasecki et al., 2016).

In 2007, the Azorean Regional Government published legislation on maritime tourist activities (Regional Legislative Decree 23/2007/A) and, in 2008, published legislation focused on Fisheries & Tourism and Recreation (Regional Legislative Decree 36/2008/A) as one of these activities. The MU, identified in the Azores as existent (Figure 3), is characterized by professional small scale fishers welcoming tourists on their boats to go along with fishers and watch, or even participate, in the



traditional fishing activity. In the Azores, the activity of Fisheries & Tourism and Recreation requires an annual licence, which has to be requested from the regional directorate with competence in the area of fisheries (currently the Regional Directorate of Fisheries). In 2015, five permits were given (three for São Jorge Island and two for Terceira Island). Until July 2016, the number increased to 11 licences in five islands (São Miguel, Terceira, São Jorge, Pico and Flores). According to Azorean legislation, tourists can fish, watch the fishers working, sleep and/or consume the fish captured in the boat or in some partner restaurant. The maximum catch for each tourist is 2 kg or one specimen in case of higher weight (Regional Legislative Decree 36/2008/A).

As mentioned by stakeholders, this MU has several benefits, namely the increasing public awareness of the knowledge needed to be a fisher (e.g. meteorology, oceanography, astronomy), even if it is empirical knowledge. Parallel activities that might result from the implementation of this MU, such as small fish markets and supporting projects to local elementary schools, were also highlighted. By contrast, one disadvantage is the need for part of the crew to remain on land while tourists go on-board to prevent the vessel's capacity being exceeded. Detailed information on DABI factors identified for this MU and scoring results are presented in sections 4 and 5 and in Appendix 1.



Figure 3 Example of location of the MU Fisheries & Tourism and Recreation in the Azores (data for MUSES, 2017)

Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection

In 2001, the United Nations Educational, Scientific and Cultural Organization (UNESCO) proposed the Convention on the Protection of the Underwater Cultural Heritage. UCH has been used as a resource for tourism and recreation in environmental protection areas. It is understood in the MUSES project as “all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for long (UNESCO, 2001) or shorter periods of time, usually designated as Historical Relevant Sites” (Haponiuk, 2015). Examples of traces of human existence are structures, buildings, artefacts and vehicles, such as vessels and aircraft. Portugal ratified that Convention in 2006 (Decree of the President of the Republic 65/2006) and, in 2004, the Regional Government of the Azores established the Regional Legislative Decree 27/2004/A, amended by Regional Legislative Decree 8/2006/A legal regime for the management of



archaeological heritage in the Region (Regional Legislative Decree 27/2004/A, amended by Regional Legislative Decree 8/2006/A).

Due to its location in the middle of the Atlantic Ocean, the Azores has been, for a long time, a strategic stopover point during the Atlantic crossings. This resulted in many shipwrecks around the Azorean islands. Many of them are accessible for visitation but many others were not found and remain submerged. There are currently five classified Underwater Archaeological Parks in the Azores: “Angra Bay” (Terceira Island) in 2005, “Dori” (São Miguel Island) in 2012, “Caroline” (Pico-Faial Channel) in 2014, and “Slavonia” (Flores Island) and “Canarias” (Santa Maria Island) in 2015. An Underwater Cultural Heritage Itinerary for the Azores was also developed, currently composed of 25 sites and with possibility to be extended. The objective is protecting those heritage assets, but also the public usufruct (Neto, 2015).

The combination of Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection was identified in the Azores as existent (Figure 4). It is characterized by touristic and recreational activities in relation with UCH taking place on environmental protection areas. UCH benefits from the conservation management measures of environmental protection areas while tourism benefits from both sectors. Detailed information on DABI factors identified for this MU and scoring results are presented in sections 4 and 5 and in Appendix 1.

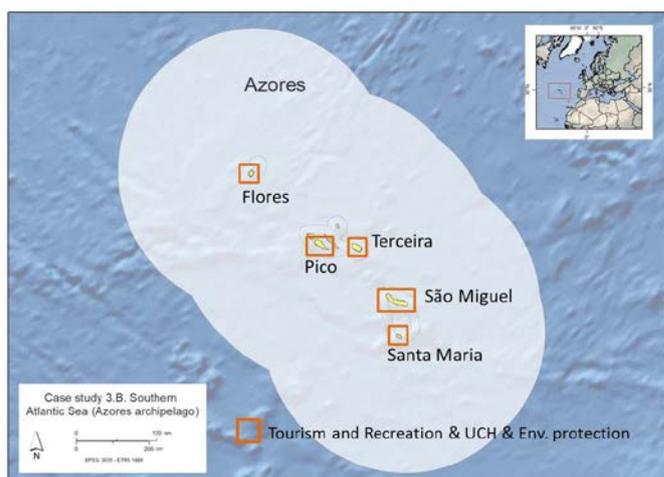


Figure 4 Examples of location of the MU Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection in the Azores (data for MUSES, 2017)

Tourism and Recreation & Environmental Protection

The combination of Tourism and Recreation & Environmental Protection was identified by stakeholders as existent in the Azores and consists of the development of touristic activities inside designated marine areas, managed with the goal of preserve natural resources. For the purposes of the MUSES project, “Environmental Protection” is defined as any area-based management solution for the marine space where measures are set up to achieve long-term conservation objectives, while other uses are managed within a clearly defined geographical scope. This definition includes, but is not limited to, sites of MPAs, Natura 2000, Biosphere reserves and Ecologically or Biologically Significant Marine Areas (EBSA’s). Existence of financial incentive systems, the increasing of eco-tourism and the increasing number’s of designated/managed sites to be explored are the main drivers



to develop this MU in the Azores. The activity should, however, be monitored to ensure marine ecosystems and natural resources are not damaged. Detailed information on DABI factors identified for this MU and scoring results are presented in sections 4 and 5 and in Appendix 1.

Scientific Research & Tourism and Recreation

The combination of Scientific Research & Tourism and Recreation was noted as being existent in the Azores during two interviews. There is one private enterprise based on Faial Island developing this combination of uses and offering both land and marine expeditions and technical research services (Figure 5). The team operating this enterprise is composed of biologists, field researchers (from the Universities of Lisbon and the Azores) and tourism professionals to provide a differentiated experience to those who search for their services. During sea trips, environmental data is collected, feeding regional and international monitoring and research programs. For example, the enterprise took tourists on board, who paid for this activity and collaborated in the censuses of common tern (*Sterna hirundo*), reducing costs to the government and increasing self-satisfaction for participating in a real scientific activity.

Activity developed by researchers from this private enterprise has been published in several scientific articles (International and peer-reviewed Journals). A link between science and tourism is promoted, as well as a platform for researchers and transference of knowledge making tourism environmentally sustainable. Detailed information on DABI factors identified for this MU and scoring results are presented in Appendix 1.

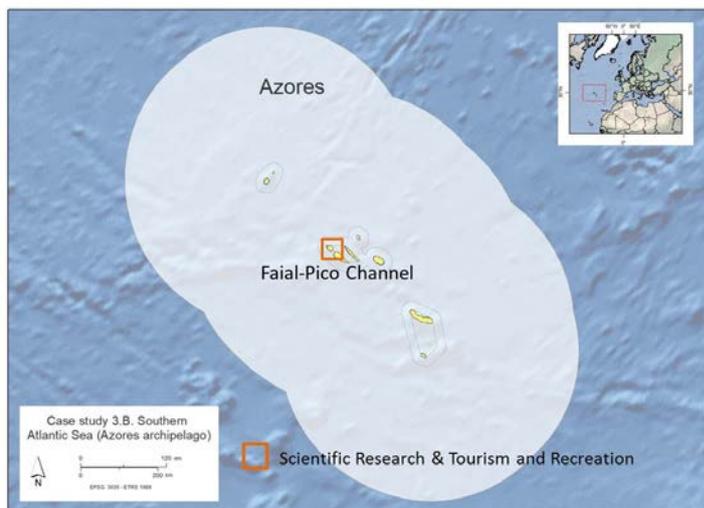


Figure 5 Example of location of the MU Scientific Research & Tourism and Recreation in the Azores (data for MUSES, 2017)

Scientific Research & Environmental Protection

The combination of Scientific Research & Environmental Protection was identified as existent in the Azores (Figure 6), since research is developed inside designated areas, classified or managed with goals of preserving natural resources, beyond the research objectives strictly necessary to accomplish the needs of the same designated area.

Availability of funds for scientific research and demand for new marine scientific research are significant drivers to the MU. Detailed information on DABI factors identified for this MU and scoring results are presented in Appendix 1.

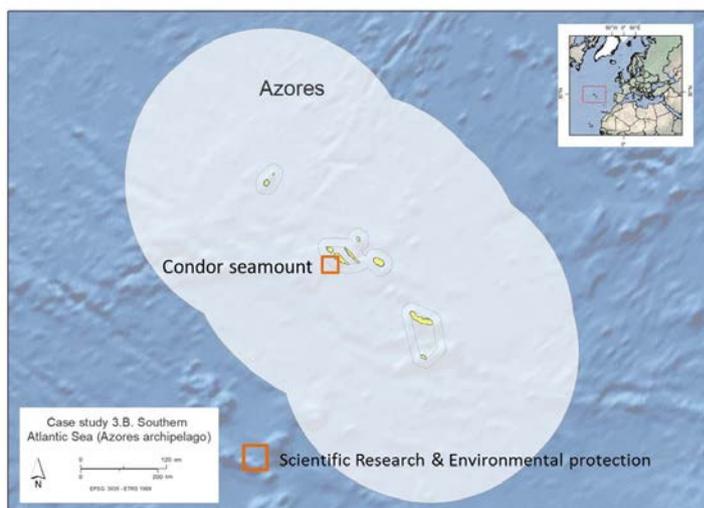


Figure 6 Example of location of the MU Scientific Research & Environmental Protection in the Azores (data for MUSES, 2017)

Scientific Research & Fisheries

The combination of Scientific Research & Fisheries was identified by one of the stakeholders as existing in the Azores (Figure 7). Currently there is some sharing of efforts from fishers to host onboard researchers from the University of the Azores, frequently as observers, and take the opportunity to collect data and information for their own research.

One of the aspects referred to during the interview was the fact that currently scientific research takes more advantage from the MU than fisheries, as main shared resources are made available by fisheries and more direct involvement of fishers in research should be promoted. Detailed information on DABI factors identified for this MU and scoring results are presented in Appendix 1.

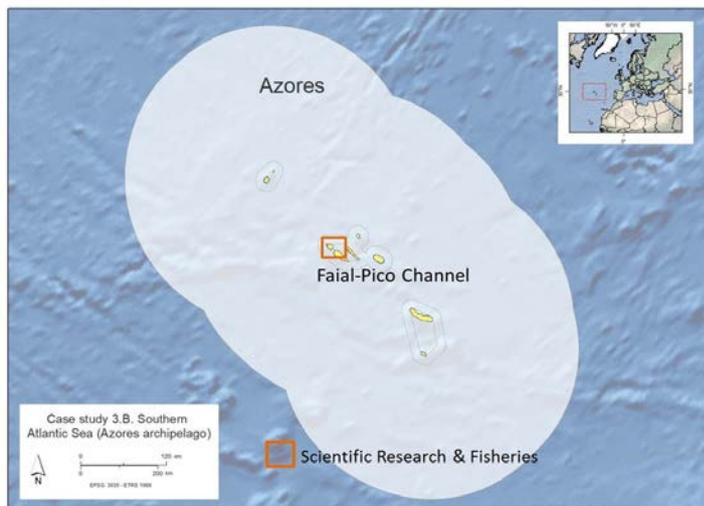


Figure 7 Example of location of the MU Scientific Research & Fisheries in the Azores (data for MUSES, 2017)

Renewable energy & Tourism and Recreation & ID

Marine renewable energies are not developed in the Azores and the Atlantic natural and weather conditions worsen the difficulties of implementing them, even more when installed energy production systems in the Azores seem to be able to satisfy most regional energy demand in the near future. Several stakeholders considered that no MU including renewables are existent in the Azores nor would be potentially happening in the near future. However the combination of Renewable energy & Tourism and Recreation & ID was identified by one of the stakeholders as a MU with potential to be developed in the Azores. It is not economically viable for the pilot wave energy plant installed on Pico Island (Figure 8) to keep functioning. The Azorean Government will have to decide between decommissioning and creating a “live lab” opened to tourism visitation. If the decision is the creation of the interpretation centre and the live lab, the MU will become existent.

As mentioned before, the Azorean Government is interested in strengthening the position of the Azores archipelago as a strategic intercontinental platform in the area of knowledge about the oceans (SPI Açores, 2014). Adapting the platform on Pico Island would contribute to increasing tourists and public awareness about new marine technologies, but would especially contribute to developing and supporting scientific research, allowing performing tests related to wave energy and linked scientific areas. This approach, however, might be expensive and will need a robust project for restoration to be viable and to attract know-how and investment. Detailed information on DABI factors identified for this MU and scoring results are presented in Appendix 1.



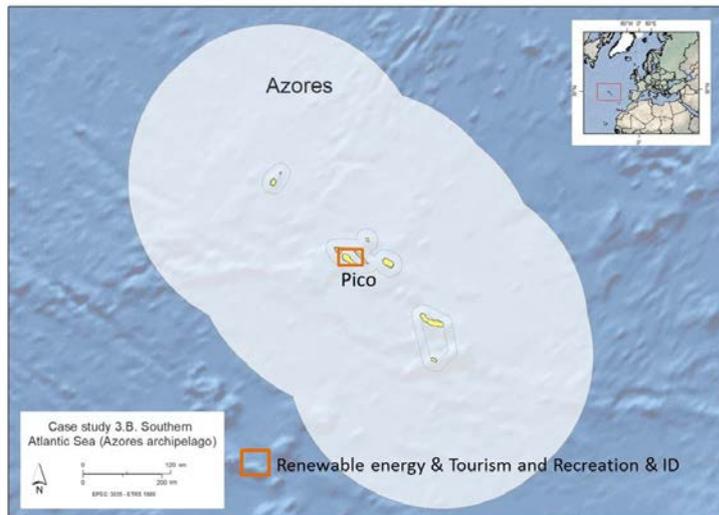


Figure 8 Location of the MU Tourism and Recreation & Whaling Cultural Heritage in the Azores (data for MUSES, 2017)

Tourism and Recreation & Whaling Cultural Heritage

The combination of Tourism and Recreation & Whaling Cultural Heritage was identified by one of the stakeholders as a MU with potential to be developed in the Azores (Figure 9), since whale hunting has a long tradition in the Azores (it has now been replaced by whale watching and tourists are increasingly interested in those traditions).

Whaling in the Azores was introduced by American whalers during the nineteenth century and the activity was very important for the Azorean economy and culture, especially on Pico and Faial Islands. The most important raw material taken from whales was oil for use in machines and instruments, soaps, perfumes, makeup products, flour, etc., but all parts of the animal were used (CM Horta, 2017; Cultura-Governo dos Açores, 2017). Techniques used by Azorean whalers were the most archaic techniques known to man, in boats with seven men, sailing or rowing and throwing harpoons by hand (Cultura-Governo dos Açores, 2017). The boat used for whaling in the Azores is a vessel unique in the world, adapted from the canoes on board of those large American whaling ships of the nineteenth century (CM Horta, 2017; Cultura-Governo dos Açores, 2017).

Whaling persisted in the Azores until the 1980s when, under the action of the International Whaling Commission, the activity was prohibited (CM Horta, 2017; Cultura-Governo dos Açores, 2017). However, due to the impact of this activity in the Region, local whaling tradition and culture have persisted with some pride and, despite hunting being finished, most of the whaling heritage has been maintained and restored for cultural, touristic and sport purposes, such as the whaling boat rowing regattas and sailing and the Whalers’ Museums established on different islands (CM Horta, 2017; Cultura-Governo dos Açores, 2017).

There is no legislation focused on this MU, however the Azorean Government has published the Regional Legislative Decree 13/98/A, which defines and characterizes the regional whaling heritage and establishes measures and support for the respective inventory, recovery, preservation and use. In addition, one Municipality of Pico Island, Lajes do Pico, is leading an application for the whale



culture to become UNESCO heritage including Pico Island and other sites in the archipelago, with the support of the Azorean Government (Público, 2017).

Detailed information on DABI factors identified for this MU and scoring results are presented in Appendix 1.

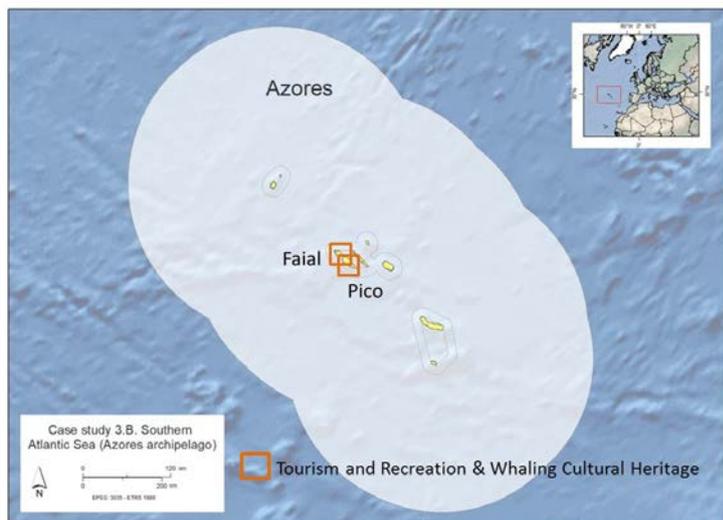


Figure 9 Examples of locations of the MU Tourism and Recreation & Whaling Cultural Heritage in the Azores (data for MUSES, 2017)

Other MU combinations

During stakeholder engagement, participants were asked to analyse combinations of uses of which they had more knowledge. As a result, some combinations were not analysed by any stakeholder, despite being considered as existent or having potential. In addition, some stakeholders, who might have had a significant contribution to some of these combinations, did not participate in the project despite being invited. Considering, as a result from desk research, that a few of these combinations are also important to the Azores, it is worth referring in this section a brief description of them.

The combination of Scientific Research & Defence is already in place in the Azores and both Academia and the Portuguese Navy have manifested interest in continuing to have partnerships. This combination is characterized by the sharing of Navy resources, mainly maritime vessels (often equipped with high technology research equipment) for scientific research purposes, with researchers from universities and/or research centres. It is highlighted that this research is not aimed at military defence purposes, but for other objectives, such as physical oceanography, marine geology, chemistry, hydrography, navigation and environmental protection.

Although not to a significant extent, Blue Biotechnology & Environmental Protection was considered to be existent in the Azores, because there is already some prospection being developed in classified areas, such as the Lucky Strike Hydrothermal Field and the Menez Gwen Hydrothermal Field. An action need to strengthen the MU is the creation of a working team focused on marine bio-prospection and able to create partnerships with the big enterprises that can collaborate with the analysis of bio-products.

Finally, MU including aquaculture might also be developed in the Azores if technological barriers, more related to the single use than to the MU (namely to resist natural and weather conditions during the Azorean winter), are overcome in the future. If this happens, both MU Aquaculture & Tourism and Recreation Aquaculture & Environmental Protection have great potential to be developed in the Azores. Aquaculture & Tourism and Recreation usually refers to existing and operational aquaculture facilities welcoming tourists for visitation. In the Azores, installed aquaculture projects include different types of aquaculture, such as fish, algae and sea urchins. Aquaculture & Environmental Protection refers to aquaculture facilities developed within designated areas managed with the goal of preserve natural resources. This combination might also refer to aquaculture developed with species that might improve environmental conditions of spots where they are located (e.g. some species of mussels and algae).



4 CATALOGUE OF MU DRIVERS, ADDED VALUES, BARRIERS, IMPACTS (DABI)

The identification of DABI factors (drivers, barriers, added values and negative impacts) to the Portuguese sub-case studies included the adaptation of DABI factors from WP2 (Sea Basin Overview), identified for Portugal, and the desk research performed, under WP3 (Case studies), for the particular case study of the Azores. DABI factor catalogues were pre-identified for each MU presented to stakeholders during interviews. Interviewed stakeholders were asked to confirm the pre-selection of DABI and to add missing DABI according to their local knowledge.

This section presents the catalogue of DABI factors for each of the three most relevant combinations of uses in the Azores: Fisheries & Tourism and Recreation, Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection and Tourism and Recreation & Environmental Protection. Detailed DABI factor identification and detailed scoring for the remaining MU are presented in Appendix 1.

4.1 MU Fisheries & Tourism and Recreation

DABI factors for the combination Fisheries & Tourism and Recreation (Table 5) were analysed by seven stakeholders. All pre-identified factors were considered to be applicable to the Azores by at least one stakeholder and some more were added to the catalogue. Added drivers are related to policy and societal drivers: the action of Community based local development (DLBC) groups (Factor D.1.5), people/fishers' will to develop the MU (Factor D.4.2), education and qualification of fishers (Factor D.4.3), increasing dissemination of the touristic offer (Factor D.4.4) and more dissemination of successful cases (Factor D.4.5); additional 'added values' are related to economic, societal, environmental and governance: the opportunity for job creation (Factor V.1.5), the fact that the MU creates, preserves and promotes other activities, such as accommodation, tour guides and catering (Factor V.1.6), an increase in the dynamic of local market (Factor V.1.7), the increasing perception of fish as ambassador of the Region (Factor V.2.6), sharing of good practices between actors, both fishers sharing knowledge and good practices with tourists and tourists sharing with fishers (Factor V.3.4), lower pressure (and need to fishers) to apply for financial social support (Factor V.6.1) and the reduction of financial support for fleet decommissioning (Factor V.6.2); and the only added barrier is the low self-esteem, qualification and training (Factor B.6.4) of local fishers to deal with the public and with tourists, for example speaking a foreign language. No significant negative impacts were identified to result from the implementation of this MU.



Table 5 Final catalogue of DABI factors for the MU Fisheries & Tourism and Recreation for the Azores (data for MUSES, 2017)

DRIVERS = factors promoting MU	BARRIERS = factors hindering MU
<p>Category D.1 – policy drivers</p> <p>Factor D.1.1 Dedicated regional funds specific for pescaturism activity</p> <p>Factor D.1.2 “European Maritime and Fisheries Fund (EMFF)” for 2014-2020 has an aim of diversifying fishing activity</p> <p>Factor D.1.3 Strategic measures for fisheries sector with the aim to diversify fishing activity with tourism</p> <p>Factor D.1.4 Limitation (e.g. quotas, closed seasons and not allowed areas) in fisheries activities</p> <p>Factor D.1.5 DLBC (Community based local development)</p>	<p>Category B.1 – legal barriers</p> <p>Factor B.1.1 Legal aspects concerning hygiene and security of passengers on the vessel</p> <p>Factor B.1.2 Need for a second licence</p> <p>Factor B.1.3 Funding schemes are decentralized (e.g. national funds are subjected to specific regional development priorities)</p>
<p>Category D.2 – interactions with other uses</p> <p>Factor D.2.1 High number of maritime activities in the area – need to limit conflicts</p>	
<p>Category D.3 – economic drivers</p> <p>Factor D.3.1 Tourism growth</p> <p>Factor D.3.2 Financial incentive systems</p> <p>Factor D.3.3 Low potential for fisheries’ growth</p> <p>Factor D.3.4 Ensure all year activity for fishermen and tourism</p> <p>Factor D.3.5 Find new sources of income</p> <p>Factor D.3.6 Increasing eco-tourism</p>	<p>Category B.3 – financial barriers / risks</p> <p>Factor B.3.1 Concurrence with other tourism sectors</p> <p>Factor B.3.2 Lack of adequate funding for start-up of activity (e.g. buy material for ensuring security or pay a second licence and insurances)</p> <p>Factor B.3.3 Maintenance costs</p>
<p>Category D.4 – societal drivers</p> <p>Factor D.4.1 Need to diversify fishing activity to maintain fishing communities identity</p> <p>Factor D.4.2 People/fishers’ will</p> <p>Factor D.4.3 Education/Qualification of fishers</p> <p>Factor D.4.4 Increase dissemination to tourists</p> <p>Factor D.4.5 More dissemination of successful cases</p>	<p>Category B.4 –barriers related with technical capacity</p> <p>Factor B.4.1 Lack of expertise to deal with tourists (e.g. language and communication skills)</p> <p>Factor B.4.2 Lack of expertise to develop organized economic business</p> <p>Factor B.4.3 Need of logistic infrastructure in land (it can be a partner)</p> <p>Factor B.4.4 Lack of advertisement/publicity of the MU</p> <p>Factor B.4.5 Lack of on-line platform to contact the fishers</p>
<p>Category D.5 – legal drivers</p> <p>Factor D.5.1 National legislation focused on pescaturism</p> <p>Factor D.5.2 Regional legislation focused on pescaturism</p> <p>Factor D.5.3 Licence is issued in short time</p> <p>Factor D.5.4 Licence process for pescaturism is similar to the process for commercial fishery</p> <p>Factor D.5.5 Easiest licensing</p>	<p>Category B.5 – barriers related with social factors</p> <p>Factor B.5.1 Resistance to change in small fishing communities</p> <p>Factor B.5.2 Risks on board (e.g., fall during recovering gear)</p>
<p>Category D.6 – environmental drivers</p> <p>Factor D.6.1 Public awareness of responsible fisheries and tourism activities</p> <p>Factor D.6.2 Need to reduce tourist pressure on the coast</p> <p>Factor D.6.3 Reduction of fisheries exploitation</p>	<p>Category B.6 – barriers related with environmental factors</p> <p>Factor B.6.1 Current degradation of marine resources might impair the activity</p> <p>Factor B.6.2 Restriction/dependence on fishing ban periods</p> <p>Factor B.6.3 Restriction/dependence on weather conditions</p> <p>Factor B.6.4 Low self-esteem / Qualification / Training</p>



ADDED VALUES = positive effects of MU	IMPACTS = negative effects of MU
<p>Category V.1 – economic added value Factor V.1.1 Increase of local economy Factor V.1.2 Development of new market opportunities for both traditional fisheries and tourism (e.g. integrative income for fishers) Factor V.1.3 Extension of income season for both tourism and fisheries Factor V.1.4 Diversification of tourism sector Factor V.1.5 Job creation Factor V.1.6 Creates, preserves and promotes other activities (e.g. accommodation, tour guides, catering) Factor V.1.7 Dynamic of local market</p>	<p>Category I.1 - economic impacts Factor I.1.1 Concurrence for other tourism sectors (e.g. whale watching and recreational fishing)</p>
<p>Category V.2 – societal added value Factor V.2.1 Involving fisher’s family to help onshore Factor V.2.2 Conservation of traditional fisheries and their culture Factor V.2.3 Education and public awareness about state and issues of fisheries, as well as fisher culture Factor V.2.4 Promotion of seafood diet Factor V.2.5 Opportunity for tourists to present a high degree of satisfaction (e.g. Sardinia – Italy) Factor V.2.6 Fish as ambassador of the Region</p>	
<p>Category V.3 – environmental added value Factor V.3.1 Education and public awareness about state and issues of marine environment Factor V.3.2 More sustainable than the single use of traditional fisheries because there is a limited catch Factor V.3.3 Reduction of tourists in the coast (e.g. traditional beach tourism) Factor V.3.4 Sharing of good practices</p>	
<p>Category V.5 - technical added values Factor V.5.1 Improvement of technical skills (e.g. fishers become tourist actors)</p>	
<p>Category V.6 – governance added values Factor V.6.1 Lower pressure to apply for financial social support Factor V.6.2 Reduction of financial support for fleet decommissioning</p>	

4.2 MU Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection

DABI factors for the combination Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection for the Azores (Table 6) were analysed by three stakeholders. All pre-identified factors were considered to be applicable to the Azores by at least one stakeholder and a few more were added to the catalogue. The only driver added to the catalogue is related to policy drivers and it was the creation of a support system for tourism destination and products (D.1.1); the only added value is related to governance and it is the reinforcement of the regional public budget for UCH and environmental protection (Factor V.6.1); also the only added barrier was related to legal barriers and it was the national and regional legal framework (Factor B.1.2), in addition to the



UNESCO Convention on the Protection of the UCH. No negative impacts were added as resulting from the implementation of this MU.

Table 6 Final catalogue of DABI factors for the MU Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection for the Azores (data for MUSES, 2017)

DRIVERS = factors promoting MU	BARRIERS = factors hindering MU
<p>Category D.1 – policy drivers Factor D.1.1 Support system for tourism destination and products</p>	<p>Category B.1 – legal barriers Factor B.1.1 UNESCO Convention on the Protection of the UCH Factor B.1.2 National and regional legal framework</p>
<p>Category D.2 – interactions with other uses Factor D.2.1 Multiple synergies between UCH, tourism and environmental protection</p>	
<p>Category D.3 – economic drivers Factor D.3.1 Financial incentive systems Factor D.3.2 Increasing eco-tourism Factor D.3.3 Need to diversify tourism sectors Factor D.3.4 Increasing number of sites of marine and UCH resources to be explored</p>	
<p>Category D.4 – societal drivers Factor D.4.1 Harmonize the protection of submerged heritage Factor D.4.2 Prevent the destruction of submerged archaeological sites Factor D.4.3 Increasing awareness for the value of cultural heritage</p>	<p>Category B.4 – barriers related with technical capacity Factor B.4.1 Tourists might need specialized skills (e.g. diving certification) Factor B.4.2 Design of new equipment (vessels to observe sea floor) Factor B.4.3 Natural deterioration of the archaeological material</p>
<p>Category D.5 – legal drivers Factor D.5.1 UNESCO Convention on the Protection of the UCH Factor D.5.2 National legislation focused on management of archaeological heritage Factor D.5.3 Regional legislation focused on management of archaeological heritage Factor D.5.4 UNCBD & Natura 2000 Factor D.5.5 National legislation focused on conservation and management of natural resources Factor D.5.6 Regional legislation focused on conservation and management of natural resources</p>	
<p>Category D.6 – environmental drivers Factor D.6.1 Need to expand environmental conservation Factor D.6.2 Increasing awareness of the value of natural resources Factor D.6.3 Need to reduce tourist pressure on the coast Factor D.6.4 Need to reduce fishers Factor D.6.5 Need to reduce free divers</p>	<p>Category B.6 – barriers related with environmental factors Factor B.6.1 Restriction/dependence on weather conditions Factor B.6.2 Tourism is not allowed if the area is highly sensitive to negative impacts of the tourists</p>
<p>Category D.7 – technical drivers Factor D.7.1 Preservation of UCH in situ is the first option and public access shall be promoted</p>	



ADDED VALUES = positive effects of MU	IMPACTS = negative effects of MU
<p>Category V.1 – economic added value Factor V.1.1 Increase of local revenues related with tourist services Factor V.1.2 Diversification of tourism sector Factor V.1.3 Opportunity for tourism green label certification</p>	<p>Category I.1 - economic impacts Factor I.1.1 Other activities are forbidden, except scientific research with authorization</p>
<p>Category V.2 – societal added value Factor V.2.1 Education and public awareness about UCH and its respective history Factor V.2.2 Prevent the destruction of submerged archaeological sites Factor V.2.3 Establishment of an ecosystem service for the UCH site</p>	<p>Category I.2. - social impacts Factor I.2.1 Risk of looting/stealing from underwater archaeological sites and destruction of their contexts Factor I.2.2 Risk of congested diving sites Factor I.2.3 Risk of damage to the archaeological material caused by inexperienced divers</p>
<p>Category V.3 – environmental added value Factor V.3.1 Lower impact use of environmental and cultural resources Factor V.3.2 Protection of natural resources associated to the archaeological material Factor V.3.3 Education and public awareness about environmental protection</p>	<p>Category I.3 - Environmental impacts Factor I.3.1 Damage to the local natural resources by inexperienced divers</p>
<p>Category V.5 - technical added values Factor V.5.1 More frequent presence of divers can avoid irresponsible and intrusive access and unauthorized activities Factor V.5.2 Creation of specialized professions (e.g. diving guides specialized in UCH) Factor V.5.3 Development of nautical equipment and vessels that enable appreciation</p>	
<p>Category V.6 – governance added values Factor V.6.1 Reinforcement of the regional public budget for UCH and environment protection</p>	

4.3 MU Tourism and Recreation & Environmental Protection

DABI factors for the combination Tourism and Recreation & Environmental Protection (Table 7) were analysed by two stakeholders. All pre-identified factors were considered to be applicable to the Azores by at least one stakeholder and no other was added to the catalogue. Comparatively to previous MU, this combination had fewer factors identified, as it is a quite soft utilization of the maritime space.



Table 7 Final catalogue of DABI factors for the MU Tourism and Recreation & Environmental Protection for the Azores (data for MUSES, 2017)

DRIVERS = factors promoting MU	BARRIERS = factors hindering MU
<p>Category D.1 – policy drivers Factor D.1.1 Strategic plan that promotes sustainable tourism and environmental conservation</p>	<p>Category B.1 – legal barriers Factor B.1.1 Nautical sports (e.g. recreational fisheries) need authorization or are not allowed in some designated areas Factor B.1.2 It is not allowed to have both people and boat access in some designated areas</p>
<p>Category D.2 – interactions with other uses Factor D.2.1 Multiple synergies between tourism and environmental protection</p>	
<p>Category D.3 – economic drivers Factor D.3.1 Financial incentive systems Factor D.3.2 Increasing eco-tourism Factor D.3.3 Increasing number of designated/managed sites to be explored</p>	
<p>Category D.5 – legal drivers Factor D.5.1 UNCBD & Natura 2000 Factor D.5.2 National legislation focused on conservation and management of natural resources Factor D.5.3 Regional legislation focused on conservation and management of natural resources</p>	<p>Category B.4 – barriers related with technical capacity Factor B.4.1 Design of new equipment (vessels to observe sea floor)</p>
<p>Category D.6 – environmental drivers Factor D.6.1 Need to expand environmental conservation Factor D.6.2 Increasing awareness for the value of natural resources Factor D.6.3 Need to reduce tourist pressure on the coast</p>	<p>Category B.6 – barriers related with environmental factors Factor B.6.1 Restriction/dependence on weather conditions</p>
ADDED VALUES = positive effects of MU	IMPACTS = negative effects of MU
<p>Category V.1 – economic added value Factor V.1.1 Increase of local revenues related with tourist services Factor V.1.2 Diversification of tourism sector</p>	<p>Category I.1 - economic impacts Factor I.1.1 Other activities are forbidden, except scientific research with authorization</p>
<p>Category V.2 – societal added value Factor V.2.1 Establishment of an ecosystem service for designated areas</p>	<p>Category I.2. - social impacts Factor I.2.1 Risk of looting/stealing from underwater archaeological sites and destruction of their contexts Factor I.2.2 Risk of congested diving sites Factor I.2.3 Risk of damage to the archaeological material caused by inexperienced divers</p>
<p>Category V.3 – environmental added value Factor V.3.1 Lower impact use of environmental resources Factor V.3.2 Protection of natural resources Factor V.3.3 Education and public awareness about environmental protection</p>	<p>Category I.3 - Environmental impacts Factor I.3.1 Damage to the local natural resources by inexperienced divers</p>
<p>Category V.5 - technical added values Factor V.5.1 More frequent presence of tourists can avoid irresponsible and intrusive access and unauthorized activities Factor V.5.2 Development of nautical equipment and vessels that enable appreciation</p>	



5 RESULTS OF DABI SCORING: ANALYSIS OF MU POTENTIAL AND MU EFFECT

The methodology applied to the analysis presented in this section was developed for the WP3 Case Studies (Bocci et al., 2017). The scoring system used to characterize DABI factors assumes that factors influencing positively or positive impacts resulting from the implementation of the MU are assigned with a positive value, while barriers and negative impacts resulting from the implementation of the MU are assigned with a negative value, in a four-value scale. Thus, drivers and added values are assigned with values of 1, 2 or 3 and barriers and negative impacts are assigned with values of -1, -2 or -3. Values of 1 and -1 represent factors with the lower significance and values of 3 and -3 represent factors with the higher significance. A value of zero is assigned to factors that are not relevant or absent in the case study and no scoring was assigned if the stakeholder did not know or preferred not to answer. Results of scoring presented in this section are the scoring averages resulting from the individual scoring of all analysis of each of the three MU with more relevance for the sub-case study: Fisheries & Tourism and Recreation, Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection and Tourism and Recreation & Environmental Protection.

MU potential and MU overall effect are also presented in this section. The MU potential is evaluated by averaging the average drivers' score and the average barriers' score, assuming values in the interval [-1.5, 1.5] where -1.5 reflects totally negative MU potential and 1.5 totally positive MU potential. In the case MU potential assumes a zero value it is assumed that there is a balance between factors promoting MU development and factors hindering it. Similarly, the MU overall effect will be evaluated by averaging the average added values' score and the average impacts' score. The MU overall effect can assume values in the interval [-1.5, 1.5], where -1.5 reflects a totally negative effect of MU in the area and 1.5 a totally positive effect. In the case MU overall effect assumes a zero value it is assumed that there is a balance between pros and cons of MU development.

5.1 MU Fisheries & Tourism and Recreation

The MU potential and MU overall effect of the combination Fisheries & Tourism and Recreation resulted from the analysis of seven stakeholders. The tables below present the average score of drivers, barriers, added values and impacts (Table 8), as well as the average score of DABI categories (Table 9), all presented in order of importance, i.e. in descending order of the average scoring.

Fisheries & Tourism and Recreation is a combination of uses that might be starting to have an actual increase in the Azores. There are several added values coming from the implementation of this activity but there are also several barriers that need to be overcome in order to fully create the conditions to support the MU. This is reflected in the value obtained for the MU potential (0.2), very close to zero, meaning that relevance of drivers and relevance of barriers are very balanced. Categories of drivers with more relevance to the MU are societal, policy, economic and legal, while categories of barriers with more relevance are related to technical capacity, environmental and social factors. Technical barriers are mainly related to the lack of expertise to deal with tourists (for example the need to speak a foreign language and communication skills) and the lack of expertise to develop organized economic businesses. Most times, Azorean fishers become fishers by cultural inheritance of their ascendants and the local communities where they belong and do not conduct a long school career. The main barrier related to social factors is the resistance to change in small fishing communities, which is also connected to the social barriers mentioned, since the lack of skills



might hinder fishers trying new opportunities for activities. To overcome these barriers, main drivers to be potentiated would be the creation of conditions for capacity building, so fishers could improve their personal and technical skills, and higher dissemination of successful cases, to increase fishers’ and fishing communities’ self-esteem and, consequently, fishers’ will to develop the activity and invest in the MU. As one stakeholder said, to develop the MU “communities need to seize the activity”.

MU overall effect of this combination is relatively higher (0.9) than MU potential, meaning that positive effects are more relevant than negative effects. Once more, societal is the category of added values with more relevance for this MU, namely the education and public awareness about state and issues of fisheries, as well as fisher culture and the opportunity for tourists to present a high degree of satisfaction. Also relevant for the MU are the added values categories of economic and technical values, such as the creation of parallel activities (e.g. accommodation, tour guides and catering), the development of new market opportunities for both traditional fisheries and tourism and the improvement in technical skills of fishers. In relation to impacts arising from the implementation of the MU, the only impact identified is the concurrence for other tourism sectors, namely whale watching, which in any case got a low score and might not have too much expression in the Azores in the near future, considering fisheries & tourism and recreation is currently searched by a specific type of tourist.

Table 8 Final scored DABI factors for the MU Fisheries & Tourism and Recreation for the Azores (data for MUSES, 2017)

DRIVERS = factors promoting MU			BARRIERS = factors hindering MU		
Factor	Category	Average score	Factor	Category	Average score
DLBC (Community based local development)	D.1	3.0	Lack of expertise to deal with tourists (e.g. language and communication skills)	B.4	-3.0
People/fishers' will	D.4	3.0	Low self-esteem / Qualification / Training	B.6	-3.0
Education/Qualification of fishers	D.4	3.0	Lack of expertise to develop organized economic business	B.4	-2.6
Increase dissemination to tourists	D.4	3.0	Resistance to change in small fishing communities	B.5	-2.6
More dissemination of successful cases	D.4	3.0	Current degradation of marine resources might impair the activity	B.6	-2.4
Regional legislation focused on pescatourism	D.5	3.0	Lack of advertisement/publicity of the MU	B.4	-2.1
Easiest licensing	D.5	3.0	Lack of on-line platform to contact the fishers	B.4	-2.0
Find new sources of income	D.3	2.9	Restriction/dependence on weather conditions	B.6	-2.0
Tourism growth	D.3	2.6	Lack of adequate funding for start-up of activity (e.g. buy material for ensuring security or pay a second licence and insurances)	B.3	-1.7
Need to diversify fishing activity to maintain fishing communities'	D.4	2.6	Legal aspects concerning hygiene and security of passengers on the	B.1	-1.6



DRIVERS = factors promoting MU			BARRIERS = factors hindering MU		
identity			vessel		
“European Maritime and Fisheries Fund (EMFF)” for 2014-2020 has an aim to diversify fishing activity	D.1	2.5	Need for logistic infrastructure in land (it can be a partner)	B.4	-1.6
Dedicated regional funds specifically for pescatourism activity	D.1	2.4	Funding schemes are decentralized (e.g. national funds are subjected to specific regional development priorities)	B.1	-1.3
Strategic measures for fisheries sector with the aim to diversify fishing activity with tourism	D.1	2.3	Restriction/dependence on fishing ban periods	B.6	-1.1
Increasing eco-tourism	D.3	2.3	Risks on board (e.g., fall during recovering gear)	B.5	-1.0
Public awareness to responsible fisheries and tourism activities	D.6	2.3	Concurrence with other tourism sectors	B.3	-0.7
Licence is issued in short time	D.5	2.2	Need for a second licence	B.1	-0.6
Financial incentive systems	D.3	2.1			
Low potential for fisheries’ growth	D.3	2.0			
National legislation focused on pescatourism	D.5	2.0			
Reduction of fisheries exploitation	D.6	1.9			
Limitation (e.g. quotas, closed seasons and not allowed areas) in fisheries activities	D.1	1.5			
High number of maritime activities in the area – need to limit conflicts	D.2	1.0			
Ensure all year activity for fishermen and tourism	D.3	1.0			
Licence process for pescatourism is similar to the process for commercial fishery	D.5	0.7			
Need to reduce tourist pressure on the coast	D.6	0.6			
DRIVERS average score	2.2				
MU POTENTIAL			0.2		



ADDED VALUES = positive effects of MU			IMPACTS = negative effects of MU		
Factor	Category	Average score	Factor	Category	Average score
Creates, preserves and promotes other activities (e.g. accommodation, tour guides, catering)	V.1	3.0	Concurrence with other tourism sectors (e.g. whale watching and recreational fishing)	I.1	-0.3
Fish as ambassador of the Region	V.2	3.0			
Education and public awareness of state and issues of fisheries, as well as fisher culture	V.2	2.7			
Opportunity for tourists to present a high degree of satisfaction (e.g. Sardinia – Italy)	V.2	2.7			
Education and public awareness about state and issues of marine environment	V.3	2.7			
Development of new market opportunities for both traditional fisheries and tourism (e.g. integrative income for fishers)	V.1	2.6			
Conservation of traditional fisheries and their culture	V.2	2.6			
Increase of local economy	V.1	2.4			
Diversification of tourism sector	V.1	2.4			
Improvement of technical skills (e.g. fishers become tourist actors)	V.5	2.1			
Job creation	V.1	2.0			
Dynamic of local market	V.1	2.0			
More sustainable than the single use of traditional fisheries because there is a limited catch	V.3	2.0			
Sharing of good practices	V.3	2.0			
Lower pressure to apply for financial social support	V.6	2.0			
Reduction of financial support for fleet decommissioning	V.6	2.0			
Involving fisher's family to help onshore	V.2	1.9			
Promotion of seafood diet	V.2	1.6			
Extension of income season for both tourism and fisheries	V.1	1.4			
Reduction of tourists in the coast (e.g. traditional beach tourism)	V.3	0.7			
ADDED VALUES average score	2.2		IMPACTS average score		-0.3
MU OVERALL EFFECT			0.9		



Table 9 Final scored DABI categories for the MU Fisheries & Tourism and Recreation for the Azores (data for MUSES, 2017)

DRIVERS = factors promoting MU		BARRIERS = factors hindering MU	
Category	Average score	Category	Average score
Category D.4 - Societal drivers	2.7	Category B.4 - Barriers related with technical capacity	-2.3
Category D.1 - Policy drivers	2.2	Category B.6 - Barriers related with environmental factors	-1.9
Category D.3 - Economic drivers	2.1	Category B.5 - Barriers related with social factors	-1.8
Category D.5 - Legal drivers	2.1	Category B.3 - Barriers related with economic availability / risk	-1.3
Category D.6 - Environmental drivers	1.6	Category B.1 - Legal barriers	-1.1
Category D.2 - Relation with other uses	1.0		
ADDED VALUES = positive effects of MU		IMPACTS = negative effects of MU	
Category	Average score	Category	Average score
Category V.2 - Societal added values	2.3	Category I.1 - Economic impacts	-0.3
Category V.1 - Economic added values	2.2		
Category V.5 - Technical added values	2.1		
Category V.6 - Governance	2.0		
Category V.3 - Environmental added values	1.8		

5.2 MU Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection

The MU potential and MU overall effect of the combination Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection resulted from the analysis of three stakeholders. The tables below present the average score of drivers, barriers, added values and impacts (Table 10), as well as the average score of DABI categories (Table 11), all presented in order of importance, i.e. in descending order of the average scoring.

The value of the MU potential is the same as Fisheries & Tourism and Recreation (0.2) and similarly to the previous MU, there are several drivers that should be potentiated to overcome the barriers to this MU. Categories of drivers with more relevance to the MU are the relation with other uses, societal, technical and economic, while categories of barriers with more relevance are related to technical capacity and environmental factors. In order to develop this MU, the multiple synergies between UCH, tourism and environmental protection should be promoted and disseminated. Among societal drivers, prevention and public awareness of the destruction of submerged archaeological sites should be potentiated. Financial incentive systems and increasing the number of sites of marine and UCH resources to be explored should also be created and improved to promote the MU in the Azores. However, some barriers also need to be considered, since archaeological material is exposed to natural deterioration and tourists might need specialized skills (e.g. diving certification).



MU overall effect of this combination is quite low (0.1) because there are some risks identified as negative impacts that attenuate the global value of added values. Main added values are related to societal and environmental factors, such as the contribution to prevention of the destruction of submerged archaeological sites and the education and public awareness about UCH and its respective history. However, this contact of tourists with UCH is also considered as a negative impact, if for example inexperienced divers damage the archaeological material or marine natural resources. This MU can also contribute to the education and public awareness about environmental protection.

Table 10 Final scored DABI factors for the MU Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection for the Azores (data for MUSES, 2017)

DRIVERS = factors promoting MU			BARRIERS = factors hindering MU		
Factor	Category	Average score	Factor	Category	Average score
Multiple synergies between UCH, tourism and environmental protection	D.2	3.0	Natural deterioration of the archaeological material	B.4	-3
Prevent the destruction of submerged archaeological sites	D.4	3.0	National and regional legal framework	B.1	-2
Financial incentive systems	D.3	2.7	Tourists might need specialized skills (e.g. diving certification)	B.4	-2
Need to diversify tourism sectors	D.3	2.7	Restriction/dependence on weather conditions	B.6	-2
Increasing number of sites of marine and UCH resources to be explored	D.3	2.7	Tourism is not allowed if the area is highly sensitive to negative impacts of the tourists	B.6	-2
Harmonize the protection of submerged heritage	D.4	2.7	Design of new equipment (vessels to observe sea floor)	B.4	-1
Regional legislation focused on management of archaeological heritage	D.5	2.7	UNESCO Convention on the Protection of the UCH	B.1	-0.5
Increasing awareness for the value of natural resources	D.6	2.7			
Preservation of UCH in situ is the first option and public access shall be promoted	D.7	2.7			
Increasing eco-tourism	D.3	2.3			
Increasing awareness of the value of cultural heritage	D.4	2.3			
UNESCO Convention on the Protection of the UCH	D.5	2.3			
National legislation focused on management of archaeological heritage	D.5	2.3			
Regional legislation focused on conservation and management of natural resources	D.5	2.3			
Need to expand environmental conservation	D.6	2.3			
Support system for tourism destination and products	D.1	2.0			



DRIVERS = factors promoting MU			BARRIERS = factors hindering MU		
National legislation focused on conservation and management of natural resources	D.5	2.0			
Need to reduce tourist pressure on the coast	D.6	1.7			
UNCBD & Natura 2000	D.5	1.3			
Need to reduce fishers	D.6	1.0			
Need to reduce free divers	D.6	1.0			
DRIVERS average score	2.3		BARRIERS average score	-1.8	
MU POTENTIAL			0.2		
ADDED VALUES = positive effects of MU			IMPACTS = negative effects of MU		
Factor	Category	Average score	Factor	Category	Average score
Prevent the destruction of submerged archaeological sites	V.2	3.0	Risk of damage to the archaeological material caused by inexperienced divers	I.2	-2.3
Protection of natural resources associated with the archaeological material	V.3	2.7	Risk of looting/stealing from underwater archaeological sites and destruction of their contexts	I.2	-2.0
Education and public awareness about environmental protection	V.3	2.7	Risk of congested diving sites	I.2	-2.0
Increase of local revenues related with tourist services	V.1	2.3	Damage to the local natural resources by inexperienced divers	I.3	-2.0
Education and public awareness about UCH and its respective history	V.2	2.3	Other activities are forbidden, except scientific research with authorization	I.1	-1.3
Diversification of tourism sector	V.1	2.0			
Opportunity for tourism green label certification	V.1	2.0			
Establishment of an ecosystem service for the UCH site	V.2	2.0			
Lower impact use of environmental and cultural resources	V.3	2.0			
Creation of specialized professions (e.g. diving guides specialized in UCH)	V.5	2.0			
Reinforcement of the regional public budget for UCH and environment protection	V.6	2.0			
More frequent presence of divers can avoid irresponsible and intrusive access and unauthorized activities	V.5	1.7			
Development of nautical equipment and vessels that enable appreciation	V.5	1.3			
ADDED VALUES average score	2.2		IMPACTS average score	-1.9	
MU OVERALL EFFECT			0.1		



Table 11 Final scored DABI categories for the MU Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection for the Azores (data for MUSES, 2017)

DRIVERS = factors promoting MU		BARRIERS = factors hindering MU	
Category	Average score	Category	Average score
Category D.2 - Relation with other uses	3.0	Category B.4 - Barriers related with technical capacity	-2.0
Category D.4 - Societal drivers	2.7	Category B.6 - Barriers related with environmental factors	-2.0
Category D.7 - Technical drivers	2.7	Category B.1 - Legal barriers	-0.8
Category D.3 - Economic drivers	2.6		
Category D.5 - Legal drivers	2.2		
Category D.1 - Policy drivers	2.0		
Category D.6 - Environmental drivers	1.7		
ADDED VALUES = positive effects of MU		IMPACTS = negative effects of MU	
Category	Average score	Category	Average score
Category V.2 - Societal added values	2.4	Category I.2. - Social impacts	-2.1
Category V.3 - Environmental added values	2.4	Category I.3 - Environmental impacts	-2.0
Category V.1 - Economic added values	2.1	Category I.1 - Economic impacts	-1.3
Category V.6 - Governance drivers	2.0		
Category V.5 - Technical added values	1.7		

5.3 MU Tourism and Recreation & Environmental Protection

The MU potential and MU overall effect of the combination Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection resulted from the analysis of three stakeholders. The tables below present the average score of drivers, barriers, added values and impacts (Table 12), as well as the average score of DABI categories (Table 13), all presented in order of importance, i.e. in descending order of the average scoring.

The value of the MU potential is a little higher (0.4) than previous combinations, because comparatively fewer barriers were identified and were individually scored with lower values, increasing the influence of drivers in the calculation. Main drivers are related to economic, policy and factors of interaction with other uses, such as the creation of financial incentive systems, increasing eco-tourism and increasing the number of designated/managed sites to be explored, the elaboration of a strategic plan that promotes sustainable tourism and environmental conservation, and the promotion of the multiple synergies between tourism and environmental protection. Barriers to be overcome in order to better develop this MU are mainly related to legal and environmental factors, namely the impossibility of access of both people and boats to some designated areas and the dependence on weather conditions to be able to visit designated marine areas.

MU overall effect of this combination is also quite low (0.2) because there are also some risks identified as negative impacts that attenuate the global value of added values, mainly related to



environmental impacts: damage to the local natural resources, other activities are forbidden, except scientific research with authorization, risk of congested sites might decrease level of satisfaction of tourists and the MU might contribute to change the behaviour and physiology of local fauna. This MU can also contribute to increasing the local revenues related to tourist services, to diversify tourism sector offers, to establish an ecosystem service for designated areas, to lower the impact of using environmental resources, to protect natural resources and to develop nautical equipment and vessels that enable tourists' appreciation.

Table 12 Final scored DABI factors for the MU Tourism and Recreation & Environmental Protection for the Azores (data for MUSES, 2017)

DRIVERS = factors promoting MU			BARRIERS = factors hindering MU		
Factor	Category	Average score	Factor	Category	Average score
Financial incentive systems	D.3	3	Nautical sports (e.g. recreational fisheries) need authorization or are not allowed in some designated areas	B.1	-1.5
Increasing eco-tourism	D.3	3	It is not allowed to have both people and boat access in some designated areas	B.1	-1.5
Increasing number of designated/managed sites to be explored	D.3	3	Restriction/dependence on weather conditions	B.6	-1.5
Strategic plan that promotes sustainable tourism and environmental conservation	D.1	2.5	Design of new equipment (vessels to observe sea floor)	B.4	-1
Multiple synergies between tourism and environmental protection	D.2	2.5			
UNCBD & Natura 2000	D.5	2			
National legislation focused on conservation and management of natural resources	D.5	2			
Regional legislation focused on conservation and management of natural resources	D.5	2			
Increasing awareness of the value of natural resources	D.6	2			
Need to expand environmental conservation	D.6	1.5			
Need to reduce tourist pressure on the coast	D.6	1			
DRIVERS average score	2.2				
MU POTENTIAL			0.4		



ADDED VALUES = positive effects of MU			IMPACTS = negative effects of MU		
Factor	Category	Average score	Factor	Category	Average score
Increase of local revenues related with tourist services	V.1	3	Damage to the local natural resources	I.3	-2.5
Diversification of tourism sector	V.1	2.5	Other activities are forbidden, except scientific research with authorization	I.1	-2
Establishment of an ecosystem service for designated areas	V.2	2.5	Risk of congested sites might decrease level of satisfaction of tourists	I.2	-2
Lower impact use of environmental resources	V.3	2.5	Changes in behaviour and physiology of local fauna	I.3	-2
Protection of natural resources	V.3	2.5			
Development of nautical equipment and vessels that enable appreciation	V.5	2.5			
Education and public awareness about environmental protection	V.3	2			
More frequent presence of tourists can avoid irresponsible and intrusive access and unauthorized activities	V.5	2			
ADDED VALUES average score		2.4	IMPACTS average score		-2.1
MU OVERALL EFFECT			0.2		



Table 13 Final scored DABI categories for the MU Tourism and Recreation & Environmental Protection for the Azores (data for MUSES, 2017)

DRIVERS = factors promoting MU		BARRIERS = factors hindering MU	
Category	Average score	Category	Average score
Category D.3 - Economic drivers	3.0	Category B.1 - Legal barriers	-1.5
Category D.1 - Policy drivers	2.5	Category B.6 - Barriers related with environmental factors	-1.5
Category D.2 - Interactions with other uses	2.5	Category B.4 - Barriers related with technical capacity	-1.0
Category D5. -Legal drivers	2.0		
Category D.6 -Environmental drivers	1.5		
ADDED VALUES = positive effects of MU		IMPACTS = negative effects of MU	
Category	Average score	Category	Average score
Category V.1 - Economic added values	2.8	Category I.3 - Environmental impacts	-2.3
Category V.2 - Societal added values	2.5	Category I.1 - Economic impacts	-2.0
Category V.3 - Environmental added values	2.3	Category I.2. - Social impacts	-2.0
Category V.5 - Technical added values	2.3		



6 FOCUS AREAS ANALYSIS

This analysis is focused on certain characterizing elements of the case-study with the purpose to identify the needs for developing MU, impacts (both negative and positive, cumulative), barriers and enablers and actions to overcome barriers and maximize synergies. Answers to the following questions are based on stakeholder engagement and desk research, and divided in three focus areas. The analysis of focus areas included the qualitative data analysis through MAXQDA software. More details about the methodology are included in Section 7.1 (subsection Engagement method).

6.1 Focus-Area-1 "Addressing Multi-Use"

Focus-Area "Addressing Multi-Use" analyses MU development potentialities with the main objective of identifying and evaluating possibilities for (additional) MU development, ways to overcome barriers, to minimize limitations and maximize synergies.

1. Is it possible to establish / widen / strengthen MU in the case study area? (Y/N)

For which MU combination in particular?

What needs would MU satisfy?

Yes, it is possible to establish, widen and strengthen MU in the Azores, as they are barely developed in the Region and there are conditions to implement the concept. Stakeholder engagement developed during the implementation of WP3, and the outcomes of the present case-study, will allow making actors, especially governmental agencies, aware of the concept and the potentialities arising from its implementation.

Fisheries & Tourism and Recreation seems to be the MU with more potential to be both widen and strengthen in the Azores. Legislation is created focused on this MU and licensing has already been simplified by the Azorean Government. Some successful cases are already known in the fishing communities and the MU is starting to appear in more than one island of the archipelago. Also information is available for tourists to be aware of the new tourist product. Thus, the MU will probably be strengthened in the near future.

The increasing tourism in the Region is, in theory, an opportunity to establish and strengthen MU involving tourism activities, such as Tourism and Recreation & UCH & Environmental Protection, Tourism and Recreation & Environmental Protection and if current projects on aquaculture succeed to develop the single use in the Azores, there are strong possibilities that combinations of uses with aquaculture are implemented, namely Aquaculture & Tourism and Recreation

2. Is space availability an issue for MU development / strengthening in the case study area at present? (Y/N)

Will space availability become an issue for your area in the future? (Y/N)

For what elements space availability is / could become an issue?

No. Space availability in the Azores is not a problem for the development and strengthening of MU in the present. Only two interviewees noted that space is an issue in the Azores (Figure 10), in the present. Of these, one noted that it is an issue only for fishing sector. Some of them considered that space might become an issue in the future if correct measures of management of the sea are not



developed. However, in general, in the near future space will not be an issue for the development of MU in the Azores. The future development of MSP for the Azores might contribute to avoiding problems regarding maritime space availability.

Code System	Int. 1	Int. 2	Int. 3	Int. 4	Int. 5	Int. 6	Int. 7	Int. 8	Int. 9	Int. 10	Int. 11	SUM
KEQ 1-2 Space availability												0
No												4
In the future												3
Yes												2
Σ SUM	1	1	1	0	1	1	1	1	1	0	1	9

Figure 10 MAXQDA analysis for KEQ 2 from Focus-Area-1 (data for MUSES, 2017).

3. Are there MU combinations and potentials that will share the same resources but in different times (e.g. reuse of an infrastructure after the end of its first life and original scope)? (Y/N) What are they?

Yes. Sharing of resources in different times, in the Azores, might happen in the cases that initial single uses are later adapted to MU involving tourism and recreation, namely:

- Renewable energy & Tourism and Recreation & ID, if conditions to adapt the pilot wave energy plant, installed on Pico Island, to visitation and ID are established;
- Tourism and Recreation & Whaling Cultural Heritage, using whaling boats for tourism and sport activities;
- Aquaculture & Tourism and Recreation or Aquaculture & Environmental Protection, if current projects succeed to operate in the Azores.

4. What would be the most important resources to be shared between uses (infrastructures, services, personnel, etc.)?

In the Azores, the most important resources to be shared between uses are equipment, human resources and infrastructures (Figure 11), such as vessels, fuel and vessels’ crew.

Code System	Int. 1	Int. 2	Int. 3	Int. 4	Int. 5	Int. 6	Int. 7	Int. 8	Int. 9	Int. 10	Int. 11	SUM
KEQ 1-4 Shared resources												0
Water space												0
Knowledge resources												0
Equipment												3
Human resources												3
Services												0
Infrastructures												2
Σ SUM	0	3	0	0	1	2	2	0	0	0	0	8

Figure 11 MAXQDA analysis for KEQ 4 from Focus-Area-1 (data for MUSES, 2017).

5. Are existing and/or potential MUs taken into account within the existing or under development Maritime Spatial Plans? (Y/N)

No. At the moment, the Azores has not developed a regional MSP and guidelines come from the national MSP system, which does not refer directly the development of MU. However, during



stakeholder engagement process, regional agencies responsible for managing maritime activities and responsible for developing a regional MSP became more aware of the MU concept and potential benefits and expressed interest in considering the issues of MU during the development of the future Azorean and Macaronesian MSP.

6. How are MUs connected or related to land-based activities?

At least for those identified in the Azores, MU are connected to land-based activities quite similarly to single uses, i.e. the development of two or more joint uses does not require more land-based support activities than if it were single uses. For example, combinations of uses including Tourism and Recreation need supporting land-based facilities, infrastructures and services.

7. Is the needed knowledge and technology for MU development/strengthening in the case study area already available? (Y/N)

What is the level of maturity of available knowledge?

What is the level of readiness of available technology?

Are there still research needs? (Y/N)

In what concerns MU consisting of “soft” uses of the sea, as most of existent in the Azores, knowledge and technology is, in general, available and accessible. For MU consisting of “harder” uses of the sea, such as aquaculture, renewables and biotechnology, there is the need for further research, pilot projects and testing sites as well as dissemination of good practices.

8. What action(s) would you recommend to develop / widen / strengthen MU in the case study area?

What actor(s) do you see particularly important to develop / widen / strengthen MU in the case study area?

There are several actions that could contribute to developing, widening and strengthening MU in the Azores, most of them noted by stakeholders during engagement process (Figure 12).

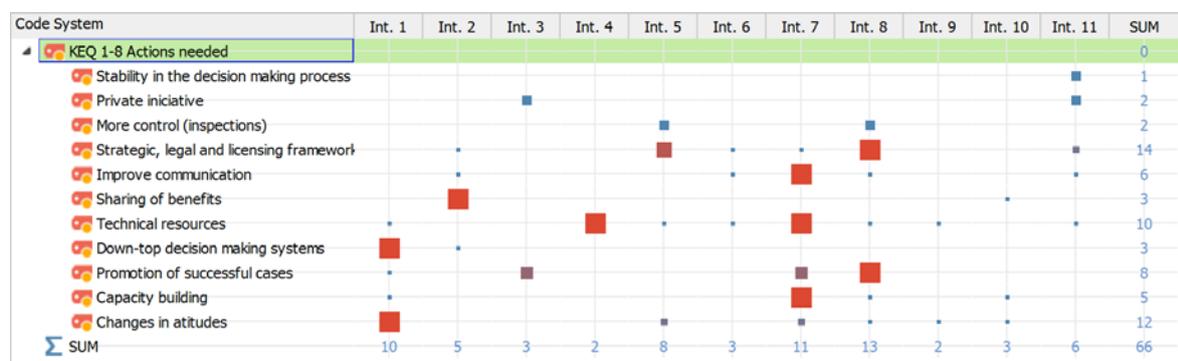


Figure 12 MAXQDA analysis for KEQ 8 from Focus-Area-1 (data for MUSES, 2017).



Adapting and improving the strategic, legal and licensing frameworks are two crucial actions. These includes the definition of a MSP and a strategy to address MU in the Region, as well as the creation of specific legislation focusing on the MU or covering missing legal aspects also from single uses (e.g. legal enforcement for fishing vessels to have observers onboard and to actively involve bank institutions). In addition, simplification of licensing and positive encouraging measures (e.g. reduction of licensing costs) to who is developing MU. Better and faster governmental decisions were also mentioned as being needed to speed up the process of actually implementing the MU concept in the Azores. Main actors to address these actions are governmental agencies with competences on maritime activities, at the regional level, but in cooperation with national level, if questions are decided at national level.

Certain technical resources should be provided to ease the development of the MU, namely the development of a platform to support Fisheries & Tourism and Recreation to spread the MU online, increase of marketing to promote MU (especially those including tourism and recreation), more scientific characterization of natural and physical resources, capacity to attract know-how and investment and higher interaction between departments and availability of technicians. Several actors might contribute to these actions, namely governmental agencies and funding bodies, by channeling the funds for these actions, and the University and research centers by developing their activities in closer communication with local actors.

There is also a great need to promote changes in attitudes, mainly in what concerns soft skills of actors to deal with the public and with tourists, and self-esteem of local communities to better accept changes and taking some risks with alternative opportunities. These actions are also related to capacity building, as most times self-esteem and technical skills are directly associated. Main actors to these actions are governmental agencies with competences in sea, but also governmental agencies with competences on social affairs and education, on order to promote educational actions (e.g. foreign language and entrepreneurship), as well as local sectoral and civil organizations dealing directly with local communities.

However, it was noted by one stakeholder that actually develops one MU, that too many financial aids might be dangerous, since local actors could rely on subsidies to maintain the activity instead of become self-sustaining.

Promotion of successful cases was also identified as an important action to encourage other actors developing MU. Main actors to address this need are both governmental agencies, who have the power to engage for example social media, as well as actors already developing the MU, who can spread their personal opinion.

Improved communication between actors is also an action that can promote the development of MU and also help addressing previous actions.

With less significance, but also worth referring to, is the need to develop bottom-up decision making system (e.g. community based local development groups, because locally active people know the real needs of their communities and their increasing involvement might also result in more responsible users of the maritime space); the need to improve the sharing of benefits, so that profit from developing a MU does not remain with only one of the actors (for example, the MU Scientific research & Fisheries); the need to have more control in place; the need of private initiative and investment; and the need of more stability within the decision making process.



6.2 Focus-Area-2 "Boosting Maritime Blue Economy"

Focus-Area "Boosting Maritime Blue Economy" analyses those aspects of MU linked to the development of maritime economy.

1. Do you see added values for society and economy at large and/or for local communities of developing / widening / strengthening MU in the case study area? (Y/N).

What are the most important ones?

Yes, there are benefits of developing, widening and strengthening MU in the Azores. Besides those identified for individual MU during analysis of DABI factors, stakeholders mentioned (Figure 13), for example, the promotion of parallel activities due to the increase of tourism activities which has to be accompanied by tourism facilities and services inland to support the MU. New linkages of activity sectors that used to be separated inherently imposes sharing of knowledges when it is necessary to develop in coordination. Bringing tourism into contact with other economic sectors also contributes to increased knowledge sharing and awareness on those activities. Also as consequence of knowledge sharing and increasing public awareness, traditional activities become more valued, respected and appreciated. Alternative incomes arising from new combinations of maritime uses, especially in local communities with limited access to wider businesses markets, such as those in small islands, is also a significant benefit of MU.

Code System	Int. 1	Int. 2	Int. 3	Int. 4	Int. 5	Int. 6	Int. 7	Int. 8	Int. 9	Int. 10	Int. 11	SUM
KEQ 2-1 Benefits socio-economy												0
Promotes parallel activities								1				4
Sharing of knowledge	1		1									3
Valuation of traditional activities	1		1					1				2
Alternative income	1						1					2
Public awareness	1											1
SUM	5	1	2	0	0	0	1	3	0	0	0	12

Figure 13 MAXQDA analysis for KEQ 1 from Focus-Area-2 (data for MUSES, 2017).

2. Is it possible to quantify the socio-economic benefits related to MUs and how they (could) contribute to the sea economy at local and regional/national scale? (Y/N)

What tools, knowledge, experiences are available?

In general, it is possible to quantify socio-economic benefits related to MU, even if it is an estimate of profit before MU and after MU, or an estimation of how a certain stakeholder has been spared an expense because of the MU implemented. Most times, however, tools and methodologies to make those estimates are the same as for single uses. Particular tools such as methodologies to directly evaluate the MU might be absent or difficult to apply.

3. Would MU development / strengthening be an opportunity for job creation and / or job requalification in your area? (Y/N)

Yes, it is generally accepted (Figure 14) that developing and strengthening MU can contribute to creating jobs and requalifying existing jobs, including both in direct activities of the MU and parallel activities, such as catering for Fisheries & Tourism.



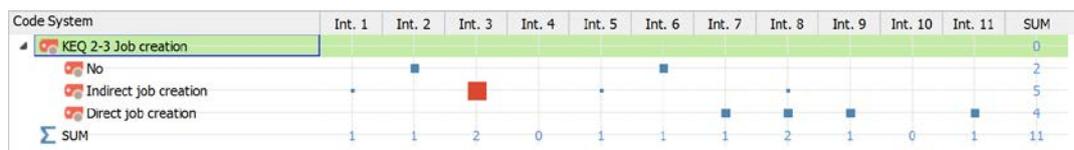


Figure 14 MAXQDA analysis for KEQ 3 from Focus-Area-2 (data for MUSES, 2017).

4. Do you see possible elements of attractiveness for investors in developing / widening / strengthening MU in the case study area? (Y/N)

What are these elements?

Yes. Several MU identified in the Azores are related with tourism activities. The growth in tourism in recent years in the Azores has already attracted investment to the Region, especially inland. The scenario showing that tourism will continue to grow in the Azores and the need to diversify the offer, together with the need for alternative sources of income might be attractive elements for more investment, including in maritime activities. In what concerns “harder” uses of the sea, such as aquaculture, the success of implementation of recent projects might be the main attractive element for MU including aquaculture, since natural and weather conditions seem to be a significant barrier to those MU and others which are highly dependent on soft characteristics of the sea.

5. What are possible investors interested in developing / widening / strengthening MU in the case study area?

The concept of MU in the Azores is not yet well known and performed interviews did not allow for correct identification of interests of investors with specific focus on MU. However sector investors may become interested if any kind of incentive is available (e.g. taxes, licensing, insurance).

6. Is there sufficient dialogue between the stakeholder sectors for developing / widening / strengthening MU? (Y/N)

Would dialogue facilitation be an asset? (Y/N)

No. There is already dialogue between stakeholder sectors in the Azores, only one stakeholder noted that dialogue should be implemented because it does not exist (Figure 15). However, only two stakeholders stated that existing dialogue is sufficient. Thus, encouraging and improving dialogue with regard to MU would actually be an asset for the MU context in the Azores.

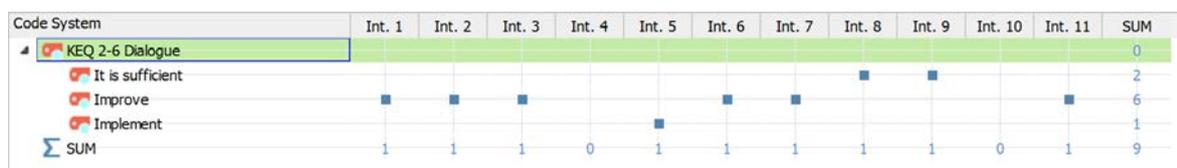


Figure 15 MAXQDA analysis for KEQ 6 from Focus-Area-2 (data for MUSES, 2017).



7. In order to promote MU development / strengthening in the case study area,

- would the availability of a vision/strategy (e.g. at national or sub-regional level) be helpful? (Y/N)
- would a feasibility study including evaluation of alternative scenarios be helpful? (Y/N)
- would detailed projects on already identified simulations be useful? (Y/N)
- do you see other enablers?

The answer is yes to the four questions. The availability of a vision and a strategy for MU in the Azores would be helpful, as it would be a tool to disseminate the concept, its benefits and local opportunities. However, more than alternative scenarios, promotion of successful cases might be a better asset, especially for activities that need to be proven to be possible in the Azores (i.e. aquaculture). Also measures involving social media, due to their power to reach the public, could contribute to promoting and developing MU.

6.3 Focus-Area-3 "Improving environmental compatibility"

Focus-Area "Improving environmental compatibility" analyses aspects of MU linked to the protection of the marine environment and/or mitigate existing impacts.

1. What are / would be the environmental added values (= positive environmental impacts) of developing / widening / strengthening MU in the case study area?

Increase in public awareness and education about environmental issues and sharing of good environmental practices together with improved protection of the environment are important added values.

2. Which tools (conceptual, operational) are used or should be further developed and used to better estimate environmental impacts and benefits of MU?

The set of tools includes GIS and remote sensing to monitor impacts geographically; Environmental Impact Assessment, Cost-Benefit Analysis and plans to control regular actions; indicators of environmental quality; and contribution of MU to the blue economy; tourism satisfaction surveys; indexes of crowding in marine environments and dissemination of good practices.

**3. Is saving free sea space for nature conservation a driver for MU the case study area? (Y/N)
Are there evidences about the present and future benefits of reserving free sea space? (Y/N)
What are they?**

Yes, saving free space for nature conservation in the Azores might be a driver for MU implementation and strengthening as most existent MU involve directly Environmental Conservation or other uses that depend on good environmental conditions of the sea, such as tourism. Despite being a limitation in some cases, namely when prohibitive legislation is force, it is generally accepted (Figure 16) that saving free space for nature conservation benefits MU.



Code System	Int. 1	Int. 2	Int. 3	Int. 4	Int. 5	Int. 6	Int. 7	Int. 8	Int. 9	Int. 10	Int. 11	SUM
KEQ 3-3 Free space for conservation												0
No			1								1	2
Yes					1	1	2	2	1			7
Σ SUM	0	0	1	0	1	1	2	2	1	0	1	9

Figure 16 MAXQDA analysis for KEQ 3 from Focus-Area-3 (data for MUSES, 2017).

4. What practical actions would you undertake to link MU development / widening / strengthening to improved environmental compatibility of maritime activities?

Practical actions to link MU development and strengthening to improved environmental compatibility of maritime activities include (Figure 17), similarly to single uses of the sea, promotion of the MU concept and actions of environmental awareness, for both MU developers and the public; more control of implemented MU through credible inspections; and the development of a strategic, legal and licensing framework that ensures environmental issues are addressed and, in case of major threats to the environment, adequately prevented, for example, through eco-friendly approaches.

Code System	Int. 1	Int. 2	Int. 3	Int. 4	Int. 5	Int. 6	Int. 7	Int. 8	Int. 9	Int. 10	Int. 11	SUM
KEQ 3-4 Actions needed for environment												0
Scientific characterization												0
Stakeholders and public awareness			1									1
More control (inspections)			1									1
Promotion of MU concept											1	1
Strategic, legal and licensing framework			1		1							2
Σ SUM	0	0	3	0	1	0	0	0	0	0	1	5

Figure 17 MAXQDA analysis for KEQ 4 from Focus-Area-3 (data for MUSES, 2017).

5. Are there win-win solutions triggering both socio-economic development and environmental protection already available for the case study area that MU should take up? (Y/N) What are they?

Yes, there are already win-win solutions in the Azores. One example is the MU Scientific Research & Tourism and Recreation, where researchers took advantage of alternative sources of livelihood and alternative income to develop scientific research (i.e. independent of public funds) and, at the same time, research might contribute to environmental protection and/or monitoring. Despite the risk of damaging natural resources, the increasing number of tourists in the sea, such as divers and in boats (if well managed), might also contribute to improve the control in marine areas that, otherwise, would be more accessible to illegal activities. It is, however, necessary to perform risk assessments of MU in order to determine the extent to which risks of implementing the MU compensate the risks of the absence of MU.



6. Is the environmentally friendly knowledge / technology for MU development/strengthening in the case study area available? (Y/N)

Which is the level of readiness of available solutions?

Are there still research needs on blue/green technologies for MU? (Y/N)

Yes and no. Most MU developed in the Azores includes mainly “soft” uses of the sea where no high technology is mandatory. For MU involving fisheries it might be necessary to improve good practices concerning environmental issues, since the tourism industry is sometimes more aware of the environmental problems than local communities. Insufficient education levels might also contribute for this scenario. In any case, the development of other MU, namely the ones including aquaculture, are dependent on importation of such blue/green technologies needed to develop and strengthen environmental friendly solutions.

7. Would it be possible to promote MU through SEA/EIA procedures? (Y/N)

What modifications would you suggest at your national / local level to promote MU through SEA/EIA procedures?

Yes. In the Azores, SEA and EIA procedures are not mandatory for maritime activities. The development of these studies could contribute to technically prove, case-by-case, the pros and cons of certain MU. One option could be, for example, to divide licensing into two phases: the first with pre-licensing for MU with potential in the area (quite similar to the current licensing process) and the second involving the elaboration of SEA and/or EIA as mandatory to issue the final licence. A change like this might be seen, however, as a problem and a complication to the licensing process (which was frequently requested during interviews to become simpler). Means of redress should also be considered in the form of encouraging incentives (e.g. tax reduction or similar).



7 STAKEHOLDER ENGAGEMENT AND LOCAL STAKEHOLDER PROFILES

This section presents detailed description of the stakeholder engagement methods used, as well as the analysis of local stakeholder profiles.

7.1 Stakeholder engagement

The stakeholder engagement process included different steps, such as mapping of stakeholders, invitation to participate and implementation of participation, which were developed as follows.

Mapping of stakeholders

The identification of stakeholders for WP3 started from stakeholder identification developed for WP2 and was based on different sources of information: screening of past and on-going MU and MSP projects, if existent, and desk research particularly focused on the Azores region. The Azores are an Autonomous region with their own governmental agencies, which have power to make political options and make decisions. Therefore, despite Portuguese sectoral governmental agencies having been interviewed for WP2, Azorean sectoral agencies with competences on the sea were now interviewed for WP3 as they possess more detailed knowledge on single and/or multi-uses in the Azorean maritime space. Sectoral private stakeholders and public organizations were also integrated in the engagement process.

Invited stakeholders

Among invited stakeholders, not all have answered or answered positively to the invitation to participate and collaborate with the MUSES project. The main form of contact was by email, however, for those cases that did not answer, phone calls were also used, in some cases more than once. Among the 16 stakeholders invited to participate, 12 positively accepted to collaborate with the MUSES project (Figure 18). Categories of stakeholders that accepted to participate include decision makers, commercial business, research organizations and sectoral or social associations, representative of main maritime sectors in the Azores, such as fisheries, tourism, scientific research, energy, culture and cross-cutting. Preference was given in cases of direct involvement in some of the pre-identified MU.

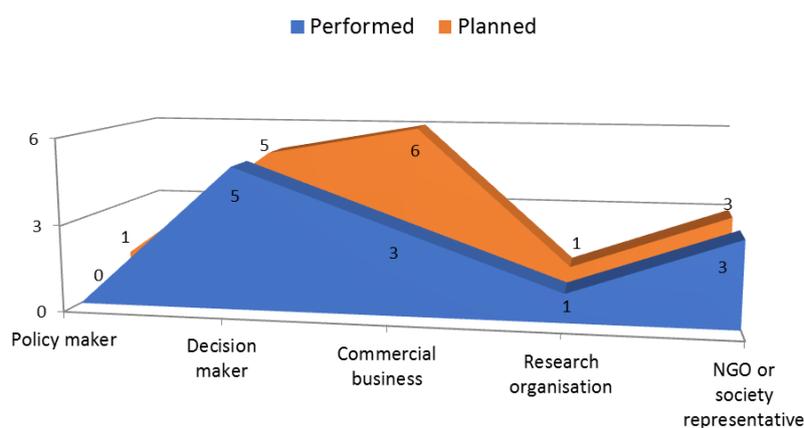


Figure 18 Number of planned and performed interviews (data for MUSES, 2017)



Stakeholder engagement method

Interviews were selected as the preferred engagement method for the present case-study, because this method is recognised as excellent for gathering information on experiences and opinions and helps to fill the gaps in knowledge that other methods are unable to bring (Dunn, 2005). As Pomeroy and Douvère (2008) state, conducting interviews is a comprehensive and efficient manner to collect data on stakeholders and their attributes, being the participatory research approach and working method most commonly used in the field of stakeholder analysis.

Once more, having WP2 and interviews performed for the Portuguese national scope as basis for these regional interviews, individual structured interviews were prepared and supporting sheets and documents were adapted to the Azorean sub-case study and context (Appendix 2).

Performed interviews were structured and conducted in different parts:

- i. Presentation of the MUSES project and objectives for the interview, including distribution of the MUSES participant information sheets to those who had not received it by email
- ii. Collecting information about the stakeholder, including signing the MUSES consent form, filling in information about the stakeholder on the corresponding sheet
- iii. Presentation of pre-identified MU and request to analyse whether they are already occurring in the Azores or have potential to occur in the near future.
- iv. Presentation of pre-identified DABI factors for each MU the stakeholder agreed to analyse in more detail and request to add missing factors at the same time that scoring was being filled
- v. Presentation of part of the key research questions to collect their opinion on each issue.

Considering nationality and availability of the stakeholders, interviews were mainly performed in Portuguese but also in English and were undertaken before the Portuguese summer break (usually during late July and/or August).

Always and only under individual stakeholders' agreement, interviews were recorded in order for it to be possible to confirm information later during the analysis and also to be transcribed and qualitatively analysed with MAXQDA software, specially key research questions.

Level of anonymity

According to WP6 (Ethics), all stakeholders were requested to sign a consent form where they identified the level of anonymity they wished to keep during the stakeholder engagement process. All stakeholders agreed to be identified in research data to be shared publically and identified as contributors in reports and other documents (Figure 19) and almost all answered yes to the quotations attributed to them. Only one stakeholder preferred not to receive further information on the MUSES project.



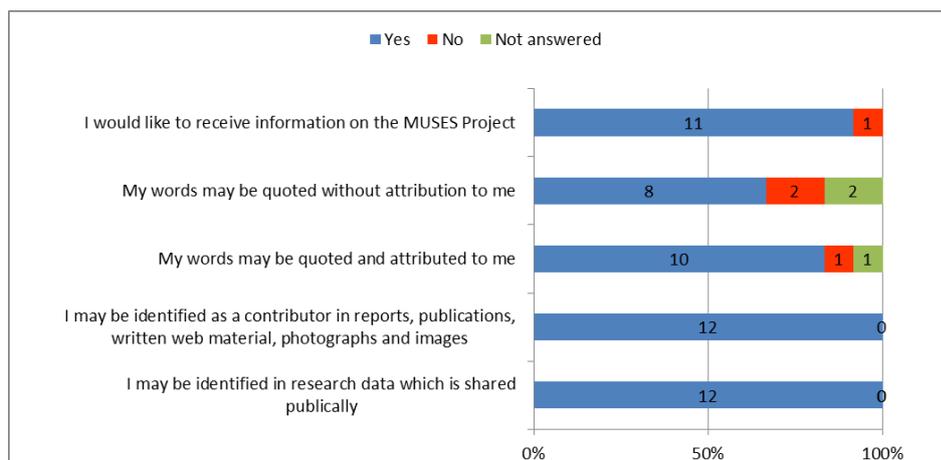


Figure 19 Level of anonymity required by stakeholders under WP3 Azorean sub-case study (data for MUSES, 2017)

7.2 Stakeholder profiles

This section presents an overview of the stakeholder profiles of the three most relevant combinations in the Azores (MU Fisheries + Tourism and Recreation, Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection and Tourism and Recreation & Environmental Protection). The elaboration of the stakeholder profiles is based on desk research and on the knowledge obtained during the stakeholder engagement process. Local stakeholder profiles are organized in themes or sectors and categories of stakeholders (e.g. commercial business or decision makers). Information is provided concerning the following themes: overall interest in MU; overall attitude towards MU; geographical scale at which stakeholder has power to operate; organisation of stakeholders; type of power to influence; and level of power.

7.2.1 MU Fisheries + Tourism and Recreation

Overall activity of relevant stakeholders in relation to the MU

All sectoral stakeholders (decision makers, commercial business and NGO's and society organizations) had a reactive interest in this MU as they accepted the invitation to collaborate with the MUSES project, especially commercial businesses, which are already developing the MU. Two cross-cutting sector stakeholders were reactive as they accepted the invitation but the other, who is a policy maker, did not respond to the invitation.

Overall attitude towards MU

All fisheries and tourism stakeholders (decision makers, commercial business and NGO's and society organizations) had a positive attitude and are driving forces for MU. One cross-sector stakeholder demonstrated negative overall attitude towards MU, but might positively influence barriers, and the other it is not possible to classify the overall attitude (positive or negative attitude) of cross-cutting sector (policy maker), since there was no response to the invitation to participate.

Geographical scale at which certain stakeholder has the power

Fisheries and tourism decision makers have a local and regional scale of action, as well as one of the sectoral associations. Generally, the other fisheries sectoral associations or other intermediaries representing society at large, as well as fisheries commercial businesses, have a more local scale of action. The cross-sector stakeholder has mainly a local and regional geographical scale.

Organization of stakeholders

Fisheries businesses are in general a monopoly of one organization, since the MU is developed by local fishers not organized in any kind of association. Identified sectoral organizations and other intermediaries representing society at large are represented by more than one organizational body.

Type of power

Fisheries and tourism decision makers have the power to control and make decisions and are, themselves, the ones who could be influenced in order to promote MU. In addition, if decisions are dependent on national actions, they can influence national agencies regarding MU. One sectoral association has the power to influence decision makers directly, since it is an association specifically focused on fisheries at the regional scale. Remaining associations and commercial businesses have the power to influence indirectly, as actions about fisheries are not the central focus of those associations.

Level of Power

Fisheries and tourism decision makers have strong power, since they are the responsible to make changes and promote or hinder the MU. Businesses and sectoral associations or any other intermediaries representing society at large have low or no level of power in general.

7.2.2 MU Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection

Overall activity of relevant stakeholders in relation to the MU

All sectoral stakeholders (decision makers and commercial business) had a reactive interest in this MU as they accepted the invitation to collaborate with the MUSES project, especially commercial businesses, which are already developing the MU. Two cross-cutting sector stakeholders were reactive as they accepted the invitation but the other, who is a policy maker, did not answer to invitation.

Overall attitude towards MU

Tourism, UCH and environmental protection sectoral stakeholders were all positive in relation to the development of MU. One cross-sector stakeholder was positive in relation to the MU, one demonstrated negative overall attitude towards MU, but might positively influence barriers, and the other it is not possible to classify the overall attitude (positive or negative attitude) of cross-cutting sector (policy maker), since there was no response to the invitation to participate.



Geographical scale at which certain stakeholder has the power

Research stakeholders and decision makers have a local, but mainly regional scale of action, implementing policies and strategies of the policy-makers. Tourism commercial businesses, as most are small businesses, have a local scale of action.

Organization of stakeholders

Tourism businesses are in general a monopoly of one organization, since the MU is developed by local small enterprises, and are not organized in any kind of association. UCH and tourism are controlled by policy makers and regulators organized on monopolies while the environmental issues are controlled by more than one regional public institution with different competences. Identified sectoral and cross-cutting decision makers have the monopoly of their public affairs.

Type of power

Tourism commercial businesses have the power to influence indirectly through regional decision makers. Decision makers have the power to control and make decisions and are, themselves, the ones who could be influenced in order to promote MU. Research organisations have power to influence directly in this regional context where they are recognised as outstanding institutions and frequently consulted.

Level of Power

The tourism businesses that effectively could sell this MU have low power to influence. The ones with strong power to influence, since they are the responsible to make changes and promote or hinder the MU, are environmental, tourism and cross-cutting decision makers. Research organisations also have low power.

7.2.3 MU Tourism and Recreation + Environmental Protection

Overall activity of relevant stakeholders in relation to the MU

All sectoral stakeholders (decision makers and commercial business) had a reactive interest in this MU as they accepted the invitation to collaborate with the MUSES project, especially commercial businesses, which are already developing the MU. Two cross-cutting sector stakeholders were reactive since they accepted the invitation but the other, who is a policy maker, did not answer the invitation.

Overall attitude towards MU

Tourism and environmental protection sectoral stakeholders were all positive in relation to the development of MU. One cross-sector stakeholder was positive in relation to the MU, one demonstrated negative overall attitude towards MU, but might positively influence barriers, and the other it is not possible to classify the overall attitude (positive or negative attitude) of cross-cutting sector (policy maker), since there was no response to the invitation to participate.



Geographical scale at which certain stakeholder has the power

Research stakeholders and decision makers have a local, but mainly regional scale of action, implementing policies and strategies of the policy-makers. Tourism commercial businesses, as most are small businesses, have a local scale of action.

Organization of stakeholders

Tourism businesses are in general a monopoly of one organization, since the MU is developed by local small enterprises which are not organized in any kind of association. Tourism is controlled by policy makers and regulators organized on monopolies while the environmental issues are controlled by more than one regional public institution with different competences. Identified sectoral and cross-cutting decision makers have the monopoly of their public affairs.

Type of power

Tourism commercial businesses have the power to influence indirectly through regional decision makers. Decision makers have the power to control and make decisions and are, themselves, the ones who could be influenced in order to promote MU. Research organisations have power to influence directly in this regional context where they are recognised as outstanding institutions and frequently consulted.

Level of Power

Many of the tourism businesses are small and medium enterprises with low level of power. Tourism and cross-cutting decision makers have a strong power, since they are responsible for making changes and promoting or hindering the MU. Remaining cross-sector stakeholders have a low level of power to influence.



8 CONCLUSIONS AND RECOMMENDATION FROM THE CASE STUDY TO THE ACTION PLAN

This report presented the analysis conducted to develop the case study methodology implementation for the sub-case study Southern Atlantic Sea (Azores archipelago).

The concept of MU as considered in the MUSES project and presented to stakeholders during regional stakeholder engagement is a relatively new concept, especially when it is considered to be joint activities intentionally developed to raise benefits for all parties. When analysing pre-identified MU, the conclusion is that some are already being developed in the Azores, even if not resulting from an integrated MU regional strategy. Those MU are mainly derived from “soft” uses of the sea, such as fisheries (traditional and small scale fisheries, tourism and recreation and environmental protection) and all of them seem to have potential to be enlarged and extended to more islands. “Harder” uses of the sea, involving higher technology, such as marine renewables, aquaculture and blue biotechnology are under different stages of development in the Azores. With exception to the pilot wave energy plant, installed on Pico Island and that might be converted in to an interpretation centre and ID unit, marine renewables were considered to not have potential in the Azores in the near future. A few aquaculture projects are just installed and it will take a little time to really understand if the available technology is sufficiently adapted to the Azores and is robust enough to survive Azorean winters, characterized by rough conditions of the sea and the weather. Finally, blue biotechnology includes prospection of biocompounds/genetic resources and might include also deep sea mining. However, these uses are currently developed as single uses and the association with additional uses will depend on the success of the activities in the short term. For example, there are already manifested intentions to associate tourism with aquaculture in the future. In this sense, it is worth noting that other combinations might have potential to be further considered by the Azorean Government, namely Scientific Research & Defence, Blue Biotechnology & Environmental Protection, Aquaculture & Tourism and Recreation and Aquaculture & Environmental Protection.

Tourism is probably the main current economic driver in the Azores and the Azorean Government is committed to this sector. Therefore, MU involving tourism will have potential to be implemented, widened and strengthened in the Azores. As wild nature and natural landscapes are the “Brand” of the Azores, preservation of ecosystems and nature conservation are of outstanding importance to maintain a qualified tourism offer. Integrating environmental protection within MU will contribute, in theory, to developing economic uses of the sea in a more sustainable way. One challenge to be overcome regarding those MU is the seasonality inherent to the Azorean destination. Despite tourist demand already increasing outside the high season, there is still a great difference between the summer and winter seasons.

One of most important actions to be developed in the Azores is the creation of a more consistent legal and administrative framework focused on MU and their development. The development of a Regional MSP focused on the Azorean context might also potentiate MU in this Region. Main actors to address this topic are regional government agencies with competences in the sea (e.g. Regional Secretariat of the Sea, Science and Technology, supported by Regional Directorate of Sea Affairs, supported by Regional Directorate of Fisheries) and national agencies when issues are also dependent on national decisions (e.g. General Directorate of General Directorate for Maritime Policy and General Directorate for Natural Resources, Security and Maritime Resources).

Actions to develop capacity building in the Azores, which might also contribute to a change in attitudes of local actors, are also important, since many barriers to the implementation of MU in the



Azores arise from low educational levels and low capacity to develop economically structured businesses. This issue might be addressed by governmental agencies with competences in sea, but also governmental agencies with competences on social affairs and education, on order to promote educational actions (e.g. foreign language and entrepreneurship) as well as local sectoral and civil organizations dealing directly with local communities. To support the Azorean Government deal with this barrier, financial support could be targeted to this need by pilot projects implementation.

Investment in promoting and marketing MU and their benefits, including the involvement of social media, is also a solution to help spread the MU concept, mainly with local actors who, in the specific case of the Azores, might have difficulties in access to updated information.



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APPENDIX 1 OVERALL DABI SCORING TABLES

Fisheries & Tourism and Recreation

Combination: Fisheries & Tourism and Recreation (data for MUSES, 2017)		Interviewee 1	Interviewee 3	Interviewee 6	Interviewee 7	Interviewee 8	Interviewee 10	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score	Score	Score	Score	Score		
DRIVERS										
Category D.1 - Policy drivers										
Factor D.1.1	Dedicated regional funds specific for pescaturism activity	3.0	1.0	3.0	3.0	2.0	3.0	2.0	2.4	
Factor D.1.2	“European Maritime and Fisheries Fund (EMFF)” for 2014-2020 has an aim to diversify fishing activity	3.0	1.0		3.0	2.0	3.0	3.0	2.5	
Factor D.1.3	Strategic measures for fisheries sector with the aim to diversify fishing activity with tourism	3.0	2.0	0.0	3.0	2.0	3.0	3.0	2.3	
Factor D.1.4	Limitation (e.g. quotas, closed seasons and not allowed areas) in fisheries activities	2.0	2.0		2.0	1.0	0.0	2.0	1.5	
Factor D.1.5.	DLBC (Community based local development)	3.0							3.0	
Average		2.8	1.5	1.5	2.8	1.8	2.3	2.5		2.2
Category D.2 - Relation with other uses										
Factor D.2.1	High number of maritime activities in the area – need to limit conflicts	0.0	0.0	0.0	3.0	1.0	0.0	3.0	1.0	
Average		0.0	0.0	0.0	3.0	1.0	0.0	3.0		1.0
Category D.3 - Economic drivers										
Factor D.3.1	Tourism growth	3.0	0.0	3.0	3.0	3.0	3.0	3.0	2.6	
Factor D.3.2	Financial incentive systems	1.0	1.0	3.0	1.0	3.0	3.0	3.0	2.1	



Combination: Fisheries & Tourism and Recreation (data for MUSES, 2017)		Interviewee 1	Interviewee 3	Interviewee 6	Interviewee 7	Interviewee 8	Interviewee 10	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score	Score	Score	Score	Score		
Factor D.3.3	Low potential for fisheries' growth	1.0	3.0	2.0	2.0	3.0	1.0	2.0	2.0	
Factor D.3.4	Ensure all year activity for fishermen and tourism	1.0	0.0	1.0	0.0	2.0	2.0	1.0	1.0	
Factor D.3.5	Find new sources of income	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.9	
Factor D.3.6	Increasing eco-tourism	3.0	1.0	2.0	3.0	3.0	3.0	1.0	2.3	
Average		2.0	1.3	2.3	2.0	2.8	2.5	2.0		2.1
Category D.4 - Societal drivers										
Factor D.4.1	Need to diversify fishing activity to maintain fishing communities identity	2.0	2.0	3.0	3.0	3.0	3.0	2.0	2.6	
Factor D.4.2	People/fishers' will	3.0							3.0	
Factor D.4.3	Education/Qualification of fishers	3.0							3.0	
Factor D.4.4	Increase dissemination to tourists	3.0							3.0	
Factor D.4.5	More dissemination of successful cases	3.0							3.0	
Average		2.8	2.0	3.0	3.0	3.0	3.0	2.0		2.7
Category D.5 - Legal drivers										
Factor D.5.1	National legislation focused on pescaturism	1.0	2.0	3.0	3.0	0.0	3.0	2.0	2.0	
Factor D.5.2	Regional legislation focused on pescaturism	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Factor D.5.3	Licence is issued in short time	0.0	3.0		3.0	3.0	3.0	1.0	2.2	
Factor D.5.4	Licence process for Pescaturism is similar to the process for commercial fishery	0.0	0.0		2.0	2.0	0.0	0.0	0.7	
Factor D.5.5	Easiest licensing			3.0		3.0			3.0	



Combination: Fisheries & Tourism and Recreation (data for MUSES, 2017)		Interviewee 1	Interviewee 3	Interviewee 6	Interviewee 7	Interviewee 8	Interviewee 10	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score	Score	Score	Score	Score		
Average		1.0	2.0	3.0	2.8	2.2	2.3	1.5		2.1
Category D.6 - Environmental drivers										
Factor D.6.1	Public awareness of responsible fisheries and tourism activities	2.0	3.0	2.0	3.0	2.0	2.0	2.0	2.3	
Factor D.6.2	Need to reduce tourist pressure on the coast	0.0	0.0	2.0	1.0	0.0	0.0	1.0	0.6	
Factor D.6.3	Reduction of fisheries exploitation	2.0	0.0	2.0	3.0	2.0	2.0	2.0	1.9	
Average		1.3	1.0	2.0	2.3	1.3	1.3	1.7		1.6



Combination: Fisheries & Tourism and Recreation (data for MUSES, 2017)		Interviewee 1	Interviewee 3	Interviewee 6	Interviewee 7	Interviewee 8	Interviewee 10	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score	Score	Score	Score	Score		
ADDED VALUES										
Category V.1 - Economic added values										
Factor V.1.1	Increase of local economy	3.0	1.0	1.0	3.0	3.0	3.0	3.0	2.4	
Factor V.1.2	Development of new market opportunities for both traditional fisheries and tourism (e.g. integrative income for fishers)	3.0	2.0	1.0	3.0	3.0	3.0	3.0	2.6	
Factor V.1.3	Extension of income season for both tourism and fisheries	2.0	0.0	0.0	3.0	1.0	2.0	2.0	1.4	
Factor V.1.4	Diversification of tourism sector	3.0	2.0	2.0	2.0	3.0	3.0	2.0	2.4	
Factor V.1.5	Job creation	2.0							2.0	
Factor V.1.6	Creates, preserves and promotes other activities (e.g. accommodation, tour guides, catering)	3.0							3.0	
Factor V.1.7	Dynamic of local market					2.0			2.0	
Average		2.7	1.3	1.0	2.8	2.4	2.8	2.5		2.2
Category V.2 - Societal added values										
Factor V.2.1	Involving fisher's family to help onshore	1.0	2.0	0.0	3.0	3.0	2.0	2.0	1.9	
Factor V.2.2	Conservation of traditional fisheries and their culture	2.0	2.0	3.0	3.0	3.0	3.0	2.0	2.6	
Factor V.2.3	Education and public awareness of state and issues of fisheries, as well as fisher culture	2.0	2.0	3.0	3.0	3.0	3.0	3.0	2.7	
Factor V.2.4	Promotion of seafood diet	1.0	1.0	2.0	2.0	1.0	3.0	1.0	1.6	
Factor V.2.5	Opportunity for tourists to present a high degree of satisfaction (e.g. Sardinia – Italy)	3.0	2.0	3.0	3.0	3.0	3.0	2.0	2.7	
Factor V.2.6	Fish as ambassador of the Region	3.0							3.0	
Average		2.0	1.8	2.2	2.8	2.6	2.8	2.0		2.3



Combination: Fisheries & Tourism and Recreation (data for MUSES, 2017)		Interviewee 1	Interviewee 3	Interviewee 6	Interviewee 7	Interviewee 8	Interviewee 10	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score	Score	Score	Score	Score		
Category V.3 - Environmental added values										
Factor V.3.1	Education and public awareness of state and issues of marine environment	3.0	3.0	2.0	3.0	3.0	2.0	3.0	2.7	
Factor V.3.2	More sustainable than the single use of traditional fisheries because there is a limited catch	3.0	0.0	0.0	3.0	2.0	3.0	3.0	2.0	
Factor V.3.3	Reduction of tourists in the coast (e.g. traditional beach tourism)	0.0	0.0	2.0	2.0	0.0	0.0	1.0	0.7	
Factor V.3.4	Sharing of good practices	2.0							2.0	
Average		2.0	1.0	1.3	2.7	1.7	1.7	2.3		1.8
Category V.5 - Technical added values										
Factor V.5.1	Improvement of technical skills (e.g. fishers become tourist actors)	2.0	2.0	1.0	2.0	3.0	3.0	2.0	2.1	
Average		2.0	2.0	1.0	2.0	3.0	3.0	2.0		2.1
Category V.6 – Governance										
Factor V.6.1	Lower pressure to apply for financial social support							2.0	2.0	
Factor V.6.2	Reduction of financial support for fleet decommissioning							2.0	2.0	
Average								2.0		2.0



Combination: Fisheries & Tourism and Recreation (data for MUSES, 2017)		Interviewee 1	Interviewee 3	Interviewee 6	Interviewee 7	Interviewee 8	Interviewee 10	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score	Score	Score	Score	Score		
BARRIERS										
Category B.1 - Legal barriers										
Factor B.1.1	Legal aspects concerning hygiene and security of passengers on the vessel	-1.0	-3.0	0.0	-3.0	-3.0	0.0	-1.0	-1.6	
Factor B.1.2	Need for a second licence	-1.0	-2.0	0.0	-1.0	0.0	0.0	0.0	-0.6	
Factor B.1.3	Funding schemes are decentralized (e.g. national funds are subjected to specific regional development priorities)	-1.0	0.0	0.0	-3.0	-2.0	-2.0	-1.0	-1.3	
Average		-1.0	-1.7	0.0	-2.3	-1.7	-0.7	-0.7		-1.1
Category B.3 - Barriers related with economic availability / risk										
Factor B.3.1	Concurrence with other tourism sectors	0.0	0.0	0.0	-1.0	-3.0	0.0	-1.0	-0.7	
Factor B.3.2	Lack of adequate funding for startup of activity (e.g. buy material for ensuring security or pay a second license and insurances)	0.0	-1.0	0.0	-3.0	-3.0	-3.0	-2.0	-1.7	
Factor B.3.3	Maintenance costs						-3.0			
Average		0.0	-0.5	0.0	-2.0	-3.0	-2.0	-1.5		-1.3
Category B.4 - Barriers related with technical capacity										
Factor B.4.1	Lack of expertise to deal with tourists (e.g. language and communication skills)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	
Factor B.4.2	Lack of expertise to develop organized economic business	-3.0	-3.0	-3.0	-3.0	-3.0	-1.0	-2.0	-2.6	
Factor B.4.3	Need of logistic infrastructure in land (it can be a partner)	0.0	-1.0	0.0	-3.0	-2.0	-3.0	-2.0	-1.6	
Factor B.4.4	Lack of advertisement/publicity of the MU	-2.0	-2.0	-2.0	-2.0	-3.0	-3.0	-1.0	-2.1	
Factor B.4.5	Lack of on-line platform to contact the fishers	-1.0	-2.0	-3.0	-2.0	-3.0	-2.0	-1.0	-2.0	



Combination: Fisheries & Tourism and Recreation (data for MUSES, 2017)		Interviewee 1	Interviewee 3	Interviewee 6	Interviewee 7	Interviewee 8	Interviewee 10	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score	Score	Score	Score	Score		
Average		-1.8	-2.2	-2.2	-2.6	-2.8	-2.4	-1.8		-2.3
Category B.5 - Barriers related with social factors										
Factor B.5.1	Resistance to change in small fishing communities	-3.0	-2.0	-3.0	-3.0	-3.0	-2.0	-2.0	-2.6	
Factor B.5.2	Risks on board (e.g., fall during recovering gear)	-1.0	-2.0	0.0	-3.0	0.0	0.0	-1.0	-1.0	
Average		-2.0	-2.0	-1.5	-3.0	-1.5	-1.0	-1.5		-1.8
Category B.6 - Barriers related with environmental factors										
Factor B.6.1	Current degradation of marine resources might impair the activity	-1.0	-3.0	-3.0	-3.0	-3.0	-3.0	-1.0	-2.4	
Factor B.6.2	Restriction/dependence on fishing ban periods	0.0	0.0	-1.0	-2.0	-3.0	0.0	-2.0	-1.1	
Factor B.6.3	Restriction/dependence on weather conditions	-2.0	0.0	-3.0	-2.0	-3.0	-3.0	-1.0	-2.0	
Factor B.6.4	Low self-esteem / Qualification / Training	-3.0							-3.0	
Average		-1.5	-1.0	-2.3	-2.3	-3.0	-2.0	-1.3		-1.9



Combination: Fisheries & Tourism and Recreation (data for MUSES, 2017)		Interviewee 1	Interviewee 3	Interviewee 6	Interviewee 7	Interviewee 8	Interviewee 10	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score	Score	Score	Score	Score		
NEGATIVE IMPACTS										
Category I.1 - Economic impacts										
Factor I.1.1	Concurrence with other tourism sectors (e.g. whale watching and recreational fishing)	0.0	0.0	0.0	-1.0	0.0	0.0	-1.0	-0.3	
Average		0.0	0.0	0.0	-1.0	0.0	0.0	-1.0		-0.3



Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection

Combination: Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection (data for MUSES, 2017)		Interviewee 5	Interviewee 9	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score		
DRIVERS						
Category D.1 - Policy drivers						
Factor D.1.1	Support system for tourism destination and products			2.0	2.0	
Average				2.0		2.0
Category D.2 - Relation with other uses						
Factor D.2.1	Multiple synergies between UCH, tourism and environmental protection	3.0	3.0	3.0	3.0	
Average		3.0	3.0	3.0		3.0
Category D.3 - Economic drivers						
Factor D.3.1	Financial incentive systems	3.0	2.0	3.0	2.7	
Factor D.3.2	Increasing eco-tourism	3.0	2.0	2.0	2.3	
Factor D.3.3	Need to diversify tourism sectors	3.0	3.0	2.0	2.7	
Factor D.3.4	Increasing number of sites of marine and UCH resources to be explored	3.0	2.0	3.0	2.7	
Average		3.0	2.3	2.5		2.6
Category D.4 - Societal drivers						
Factor D.4.1	Harmonize the protection of submerged heritage	3.0	3.0	2.0	2.7	
Factor D.4.2	Prevent the destruction of submerged archaeological sites	3.0	3.0	3.0	3.0	
Factor D.4.3	Increasing awareness of the value of cultural heritage	3.0	2.0	2.0	2.3	
Average		3.0	2.7	2.3		2.7



Combination: Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection (data for MUSES, 2017)		Interviewee 5	Interviewee 9	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score		
Category D.5 - Legal drivers						
Factor D.5.1	UNESCO Convention on the Protection of the UCH	2.0	3.0	2.0	2.3	
Factor D.5.2	National legislation focused on management of archaeological heritage	2.0	3.0	2.0	2.3	
Factor D.5.3	Regional legislation focused on management of archaeological heritage	2.0	3.0	3.0	2.7	
Factor D.5.4	UNCBD & Natura 2000	0.0	2.0	2.0	1.3	
Factor D.5.5	National legislation focused on conservation and management of natural resources	2.0	2.0	2.0	2.0	
Factor D.5.6	Regional legislation focused on conservation and management of natural resources	2.0	2.0	3.0	2.3	
Average		1.7	2.5	2.3		2.2
Category D.6 - Environmental drivers						
Factor D.6.1	Need to expand environmental conservation	3.0	2.0	2.0	2.3	
Factor D.6.2	Increasing awareness of the value of natural resources	3.0	2.0	3.0	2.7	
Factor D.6.3	Need to reduce tourist pressure on the coast	1.0	3.0	1.0	1.7	
Factor D.6.4	Need to reduced fishers	3.0	0.0	0.0	1.0	
Factor D.6.5	Need to reduce free divers	3.0	0.0	0.0	1.0	
Average		2.6	1.4	1.2		1.7
Category D.7 - Technical drivers						
Factor D.7.1	Preservation of UCH in situ is the first option and public access shall be promoted	3.0	3.0	2.0	2.7	
Average		3.0	3.0	2.0		2.7



Combination: Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection (data for MUSES, 2017)		Interviewee 5	Interviewee 9	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score		
ADDED VALUES						
Category V.1 - Economic added values						
Factor V.1.1	Increase of local revenues related with tourist services	3.0	2.0	2.0	2.3	
Factor V.1.2	Diversification of tourism sector	2.0	2.0	2.0	2.0	
Factor V.1.3	Opportunity for tourism green label certification	3.0	1.0	2.0	2.0	
Average		2.7	1.7	2.0		2.1
Category V.2 - Societal added values						
Factor V.2.1	Education and public awareness of UCH and its respective history	2.0	3.0	2.0	2.3	
Factor V.2.2	Prevent the destruction of submerged archaeological sites	3.0	3.0	3.0	3.0	
Factor V.2.3	Establishment of an ecosystem service for the UCH site	3.0	1.0	2.0	2.0	
Average		2.7	2.3	2.3		2.4
Category V.3 - Environmental added values						
Factor V.3.1	Lower impact use of environmental and cultural resources	3.0	2.0	1.0	2.0	
Factor V.3.2	Protection of natural resources associated with the archaeological material	3.0	2.0	3.0	2.7	
Factor V.3.3	Education and public awareness about environmental protection	3.0	3.0	2.0	2.7	
Average		3.0	2.3	2.0		2.4
Category V.5 - Technical added values						
Factor V.5.1	More frequent presence of divers can avoid irresponsible and intrusive access and unauthorized activities	1.0	1.0	3.0	1.7	
Factor V.5.2	Creation of specialized professions (e.g. diving guides specialized in UCH)	3.0	1.0	2.0	2.0	



Combination: Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection (data for MUSES, 2017)		Interviewee 5	Interviewee 9	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score		
Factor V.5.3	Development of nautical equipment and vessels that enable appreciation	2.0	1.0	1.0	1.3	
Average		2.0	1.0	2.0		1.7
Category V.6 - Governance drivers						
Factor V.6.1	Reinforcement of the regional public budget for UCH and environment protection			2.0	2.0	
Average				2.0		2.0



Combination: Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection (data for MUSES, 2017)		Interviewee 5	Interviewee 9	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score		
BARRIERS						
Category B.1 - Legal barriers						
Factor B.1.1	UNESCO Convention on the Protection of the UCH		0.0	-1.0	-0.5	
Factor B.1.2	National and regional legal framework			-2.0	-2.0	
Average			0.0	-1.5		-0.8
Category B.4 - Barriers related with technical capacity						
Factor B.4.1	Tourists might need specialized skills (e.g. diving certification)	-2.0	-2.0	-2.0	-2.0	
Factor B.4.2	Design of new equipment (vessels to observe sea floor)	-2.0	0.0	-1.0	-1.0	
Factor B.4.3	Natural deterioration of the archaeological material	-3.0	-3.0	-3.0	-3.0	
Average		-2.3	-1.7	-2.0		-2.0
Category B.6 - Barriers related with environmental factors						
Factor B.6.1	Restriction/dependence on weather conditions	-2.0	-3.0	-1.0	-2.0	
Factor B.6.2	Tourism is not allowed if the area is highly sensitive to negative impacts of the tourists	-2.0	-1.0	-3.0	-2.0	
Average		-2.0	-2.0	-2.0		-2.0



Combination: Tourism and Recreation & Underwater Cultural Heritage & Environmental Protection (data for MUSES, 2017)		Interviewee 5	Interviewee 9	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score	Score		
NEGATIVE IMPACTS						
Category I.1 - Economic impacts						
Factor I.1.1	Other activities are forbidden, except scientific research with authorization	-2.0	0.0	-2.0	-1.3	
Average		-2.0	0.0	-2.0		-1.3
Category I.2. - Social impacts						
Factor I.2.1	Risk of looting/stealing from underwater archaeological sites and destruction of their contexts	-3.0	-2.0	-1.0	-2.0	
Factor I.2.2	Risk of congested diving sites	-3.0	-2.0	-1.0	-2.0	
Factor I.2.3	Risk of damage on the archaeological material caused by inexperienced divers	-3.0	-2.0	-2.0	-2.3	
Average		-3.0	-2.0	-1.3		-2.1
Category I.3 - Environmental impacts						
Factor I.3.1	Damage on the local natural resources by inexperienced divers	-3.0	-2.0	-1.0	-2.0	
Average		-3.0	-2.0	-1.0		-2.0



Tourism and Recreation & Environmental Protection

Combination: Tourism and Recreation & Environmental Protection (data for MUSES, 2017)		Interviewee 5	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score		
DRIVERS					
Category D.1 - Policy drivers					
Factor D.1.1	Strategic plan that promotes sustainable tourism and environmental conservation	2.0	3.0	2.5	
Average		2.0	3.0		2.5
Category D.2 - Interactions with other uses					
Factor D.2.1	Multiple synergies between tourism and environmental protection	3.0	2.0	2.5	
Average		3.0	2.0		2.5
Category D.3 - Economic drivers					
Factor D.3.1	Financial incentive systems	3.0	3.0	3.0	
Factor D.3.2	Increasing eco-tourism	3.0	3.0	3.0	
Factor D.3.3	Increasing number of designated/managed sites to be explored	3.0	3.0	3.0	
Average		3.0	3.0		3.0
Category D5. -Legal drivers					
Factor D.5.1	UNCBD & Natura 2000	1.0	3.0	2.0	
Factor D.5.2	National legislation focused on conservation and management of natural resources	2.0	2.0	2.0	
Factor D.5.3	Regional legislation focused on conservation and management of natural resources	2.0	2.0	2.0	
Average		1.7	2.3		2.0



Combination: Tourism and Recreation & Environmental Protection (data for MUSES, 2017)		Interviewee 5	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score		
Category D.6 -Environmental drivers					
Factor D.6.1	Need to expand environmental conservation	2.0	1.0	1.5	
Factor D.6.2	Increasing awareness of the value of natural resources	2.0	2.0	2.0	
Factor D.6.3	Need to reduce tourist pressure on the coast	1.0	1.0	1.0	
Average		1.7	1.3		1.5



Combination: Tourism and Recreation & Environmental Protection (data for MUSES, 2017)		Interviewee 5	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score		
ADDED VALUES					
Category V.1 - Economic added values					
Factor V.1.1	Increase of local revenues related with tourist services	3.0	3.0	3.0	
Factor V.1.2	Diversification of tourism sector	3.0	2.0	2.5	
Average		3.0	2.5		2.8
Category V.2 - Societal added values					
Factor V.2.1	Establishment of an ecosystem service for designated areas	3.0	2.0	2.5	
Average		3.0	2.0		2.5
Category V.3 - Environmental added values					
Factor V.3.1	Lower impact use of environmental resources	3.0	2.0	2.5	
Factor V.3.2	Protection of natural resources	3.0	2.0	2.5	
Factor V.3.3	Education and public awareness about environmental protection	1.0	3.0	2.0	
Average		2.3	2.3		2.3
Category V.5 - Technical added values					
Factor V.5.1	More frequent presence of tourists can avoid irresponsible and intrusive access and unauthorized activities	2.0	2.0	2.0	
Factor V.5.2	Development of nautical equipment and vessels that enable appreciation	2.0	3.0	2.5	
Average		2.0	2.5		2.3



Combination: Tourism and Recreation & Environmental Protection (data for MUSES, 2017)		Interviewee 5	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score		
BARRIERS					
Category B.1 - Legal barriers					
Factor B.1.1	Nautical sports (e.g. recreational fisheries) need authorization or are not allowed in some designated areas	-2.0	-1.0	-1.5	
Factor B.1.2	It is not allowed to have both people and boat access in some designated areas	-1.0	-2.0	-1.5	
Average		-1.5	-1.5		-1.5
Category B.4 - Barriers related with technical capacity					
Factor B.4.1	Design of new equipment (vessels to observe sea floor)	-1.0	-1.0	-1.0	
Average		-1.0	-1.0		-1.0
Category B.6 - Barriers related with environmental factors					
Factor B.6.1	Restriction/dependence on weather conditions	-2.0	-1.0	-1.5	
Average		-2.0	-1.0		-1.5



Combination: Tourism and Recreation & Environmental Protection (data for MUSES, 2017)		Interviewee 5	Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score	Score		
NEGATIVE IMPACTS					
Category I.1 - Economic impacts					
Factor I.1.1	Other activities are forbidden, except scientific research with authorization	-2.0	-2.0	-2.0	
Average		-2.0	-2.0		-2.0
Category I.2. - Social impacts					
Factor I.2.1	Risk of congested sites might decrease level of satisfaction of tourists	-2.0	-2.0	-2.0	
Average		-2.0	-2.0		-2.0
Category I.3 - Environmental impacts					
Factor I.3.1	Damage to the local natural resources	-3.0	-2.0	-2.5	
Factor I.3.2	Changes in behaviour and physiology of local fauna	-3.0	-1.0	-2.0	
Average		-3.0	-1.5		-2.3



Scientific research & Tourism and Recreation

Combination: Scientific research & Tourism and Recreation (data for MUSES, 2017)		Interviewee 12	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
DRIVERS				
Category D.1 - Policy drivers				
Factor D.1.1	Assistance funds to support the provision of highly qualified personnel and know-how	3.0	3.0	
Factor D.1.2	Precarious state of science in Portugal	3.0	3.0	
Average		3.0		3.0
Category D.2 - Relation to other uses				
Factor D.2.1	Need to diversify the tourism and research dependence on funds and grants	2.0	2.0	
Factor D.2.2	Synergies between science and tourism - alternative use; not exclusive for tourism	3.0	3.0	
Average		2.5		2.5
Category D.3 - Economic drivers				
Factor D.3.1	Research activities, trips, jobs opportunities for Biologists are sponsored by the tourists	3.0	3.0	
Average		3.0		3.0
Category D.4 - Societal drivers				
Factor D.4.1	Financial incentive systems	1.0	1.0	
Average		1.0		1.0
Category D.5 - Legal drivers				
Factor D.5.1	Start-up from the University of Lisbon	3.0	3.0	



Combination: Scientific research & Tourism and Recreation (data for MUSES, 2017)		Interviewee 12	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
Factor D.5.2	Marine and land natural reserves and habitats	3.0	3.0	
Factor D.5.3	Boat restrictions that allows animal protection and welfare	3.0	3.0	
Average		3.0		3.0
Category D.5 - Environmental drivers				
Factor D.5.1	Diversity of marine mammal species and endemic species	3.0	3.0	
Average		3.0		3.0



Combination: Scientific research & Tourism and Recreation (data for MUSES, 2017)		Interviewee 12	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
ADDED VALUES				
Category V.1 - Economic added values				
Factor V.1.1	Increase of local revenues related with touristic services	2.0	2.0	
Factor V.1.2	Additional budget for research projects and equipment	2.0	2.0	
Average		2.0		2.0
Category V.2 - Societal added values				
Factor V.2.1	Tourists can participate in research activities and projects	2.0	2.0	
Factor V.2.2	Sharing knowledge between the academia and general public - Science communication/Education	3.0	3.0	
Average		2.5		2.5
Category V.3 - Environmental added values				
Factor C.3.1	Alternative use of environmental resources	2.0	2.0	
Average		2.0		2.0
Category V.5 - Technical added values				
Factor V.5.1	Creation of specialized professions	1.0	1.0	
Average		1.0		1.0



Combination: Scientific research & Tourism and Recreation (data for MUSES, 2017)		Interviewee 12	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
BARRIERS				
Category B.1 - Legal barriers				
Factor B.1.1	Limited number of licences	-3.0	-3.0	
Average		-3.0		-3.0
Category B.2 - Administrative barriers				
Factor B.2.1	Licences and bureaucratic paperwork - time consuming	-2.0	-2.0	
Average		-2.0		-2.0
Category B.3 - Barriers related with economic availability / risk				
Factor B.3.1	Flights connections between the mainland and the islands	-3.0	-3.0	
Factor B.3.2	Weather, volcanic and seismic events	-3.0	-3.0	
Average		-3.0		-3.0
Category B.4 - Barriers related with technical capacity				
Factor B.4.1	Absence of cooperation and synergies between University of the Azores and companies	-1.0	-1.0	
Average		-1.0		-1.0
Category B.5 - Barriers related with social factors				
Factor B.5.1	Highly qualified staff for this combination	-1.0	-1.0	
Factor B.5.2	New professional profiles required not available in the region	-2.0	-2.0	
Factor B.5.3	Lack of awareness about benefits of this MU by the academy and researchers	-3.0	-3.0	
Average		-2.0		-2.0



Combination: Scientific research & Tourism and Recreation (data for MUSES, 2017)		Interviewee 12	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
Category B.6 - Barriers related with environmental factors				
Factor B.6.1	Weather, Volcanic and seismic events	-3.0	-3.0	
Average		-3.0		-3.0



Combination: Scientific research & Tourism and Recreation (data for MUSES, 2017)		Interviewee 12	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
NEGATIVE IMPACTS				
Category I.1 - Societal impacts				
Factor I.1.1	Risks of massive tourism	-2.0	-2.0	
Average		-2.0		-2.0
Category I.2 - Environmental impacts				
Factor I.2.1	Sea activities: Boats should be "environmental friendly" to minimize the impacts of the anthropogenic ocean noise and CO2 emissions. Land activities: Risk of habitat degradation	-1.0	-1.0	
Average		-1.0		-1.0



Scientific Research & Environmental Protection

Combination: Scientific Research & Environmental Protection (data for MUSES, 2017)		Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
DRIVERS				
Category D.1 - Policy drivers				
Factor D.1.1	European, national and regional research support programs	3.0	3.0	
Average		3.0		3.0
Category D.3 - Economic drivers				
Factor D.3.1	Continuous demand for new products and technologies	3.0	3.0	
Average		3.0		3.0
Category D.4 - Societal drivers				
Factor D.4.1	Demand for new scientific knowledge	2.0	2.0	
Average		2.0		2.0
Category D.5 - Legal drivers				
Factor D.5.1	Scientific research is one of the principles for the management of the Natural Parks	2.0	2.0	
Average		2.0		2.0



Combination: Scientific Research & Environmental Protection UCH (data for MUSES, 2017)		Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
ADDED VALUES				
Category V.1 - Economic added values				
Factor V.1.1	Direct impact of research activity	1.0	1.0	
Average		1.0		0.5
Category V.2 - Environmental added values				
Factor V.2.1	Greater knowledge of resources	2.0	2.0	
Average		2.0		1.0
Category V.3 - Societal added values				
Factor V.3.1	New scientific knowledge (e.g., some discovery that can improve well-being)	3.0	3.0	
Average		3.0		1.5
Category V.4 - Technical added values				
Factor V.4.1	Development of new technological solutions	2.0	2.0	
Average		2.0		1.0



Combination: Scientific Research & Environmental Protection UCH (data for MUSES, 2017)		Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
BARRIERS				
Category B.1 - Legal barriers				
Factor B.1.1	Scientific research needs authorization to be conducted inside designated areas	-1.0	-1.0	
Factor B.1.2	It is not allowed to collect organisms in some designated areas	-1.0	-1.0	
Average		-1.0		-1.0
Category B.2 - Barriers related with social factors				
Factor B.2.1	Beliefs, traditions	-1.0	-1.0	
Average		-1.0		-1.0



Combination: Scientific Research & Environmental Protection UCH (data for MUSES, 2017)		Interviewee 11	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
NEGATIVE IMPACTS				
Category I.1 - Environmental impacts				
Factor I.1.1	Damage to the local natural resources during sample collection	-1.0	-1.0	
Average		-1.0		-1.0



Scientific research & Fisheries

Combination: Scientific research & Fisheries (data for MUSES, 2017)		Interviewee 2	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
DRIVERS				
Category D.1 - Policy drivers				
Factor D.1.1	Blue Growth (promotion)	1.0	1.0	
Average		1.0		1.0
Category D.4 - Societal drivers				
Factor D.4.1	Societies' pressure for sustainable uses and Biodiversity preservation	1.0	1.0	
Average		1.0		1.0
Category D.5 - Legal drivers				
Factor D.5.1	Common fisheries policy	3.0	3.0	
Factor D.5.3	Legislation promoting MU	1.0	1.0	
Average		2.0		2.0
Category D.5 - Environmental drivers				
Factor D.5.1	Need of protection of marine environments	2.0	2.0	
Factor D.5.2	Need of sustainable use of resources	3.0	3.0	
Average		2.5		2.5
Category D.6 - Technical drivers				
Factor D.6.1	Better communication between fishers and researchers	3.0	3.0	



Combination: Scientific research & Fisheries (data for MUSES, 2017)		Interviewee 2	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
Factor D.6.2	More direct involvement of fishers in research	2.0	2.0	
Average		2.5		2.5



Combination: Scientific research & Fisheries (data for MUSES, 2017)		Interviewee 2	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
ADDED VALUES				
Category V.1 - Economic added values				
Factor V.1.1	Sharing of resources (research can save money)	3.0	3.0	
Average		3.0		3.0
Category V.2 - Societal added values				
Factor V.2.1	Knowledge sharing	2.0	2.0	
Average		2.0		2.0
Category V.3 - Environmental added values				
Factor C.3.1	Preservation of natural resources	2.0	2.0	
Average		2.0		2.0
Category V.4 - Technical added values				
Factor V.4.1	Sharing of equipment	2.0	2.0	
Average		2.0		2.0
Category V.5 - Governance added values				
Factor V.5.1	Improvement of governance options	2.0	2.0	
Average		2.0		2.0



Combination: Scientific research & Fisheries (data for MUSES, 2017)		Interviewee 2	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
BARRIERS				
Category B.1 - Legal barriers				
Factor B.1.1	There is no obligation for fishers to cooperate	-1.0	-1.0	
Factor B.1.2	Legislation prohibiting fishing in certain areas	-1.0	-1.0	
Average		-1.0		-1.0
Category B.3 - Barriers related with economic availability / risk				
Factor B.3.1	Fishers do not receive direct economic return	-1.0	-1.0	
Average		-1.0		-1.0
Category B.5 - Barriers related with social factors				
Factor B.5.1	Resistance to collaboration (e.g. information fishers collect can be used against them)	-1.0	-1.0	
Factor B.5.2	Low education levels hinders the acceptance of more sustainable measures	-2.0	-2.0	
Average		-1.5		-1.5



Combination: Scientific research & Fisheries (data for MUSES, 2017)		Interviewee 2	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
NEGATIVE IMPACTS				
Category I.1 - Economic impacts				
Factor I.1.1	Possibility of restrictive measures for fisheries	-1.0	-1.0	
Average		-1.0		-1.0



Renewables & Tourism and Recreation & ID

Combination: Renewables & Tourism and Recreation & ID (data for MUSES, 2017)		Interviewee 4	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
DRIVERS				
Category D.1 - Policy drivers				
Factor D.1.1	Policies that promote oceanic renewable energies	3.0	3.0	
Factor D.1.2	Composition of the government with people who are sensitive to issues related with renewables energies	3.0	3.0	
Average		3.0		3.0
Category D.4 - Societal drivers				
Factor D.4.1	Tourist attraction to visit infrastructures (e.g. tourists are generally willing to pay to go see the turbines)	3.0	3.0	
Average		3.0		3.0
Category D.5 - Legal drivers				
Factor D.5.1	Specific legislation providing clear perspective for the implementation of the UM	3.0	3.0	
Average		3.0		3.0



Combination: Renewables & Tourism and Recreation & ID (data for MUSES, 2017)		Interviewee 4	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
ADDED VALUES				
Category V.1 - Economic added values				
Factor V.1.1	Diversification of tourism sector	2.0	2.0	
Factor V.1.2	Attracts investment	2.0	2.0	
Average		2.0		2.0
Category V.2 - Societal added values				
Factor V.2.1	Attracts tourists and researchers	2.0	2.0	
Factor V.2.2	Environmental awareness of the public/Centre of information and interpretation	2.0	2.0	
Average		2.0		2.0
Category V.5 - Technical added values				
Factor V.5.1	Knowledge creation (positioning of the Azores as living lab)	3.0	3.0	
Average		3.0		3.0



Combination: Renewables & Tourism and Recreation & ID (data for MUSES, 2017)		Interviewee 4	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
BARRIERS				
Category B.1 - Legal barriers				
Factor B.1.1	Legislation of MAPs	-3.0	-3.0	
Average		-3.0		-3.0
Category B.3 - Barriers related with economic availability / risk				
Factor B.3.1	Going far offshore by tour boat might not be so profitable and efficient (timewise)	0.0	0.0	
Factor B.3.2	Lack of funding	-3.0	-3.0	
Average		-1.5		-1.5
Category B.4 - Barriers related with technical capacity				
Factor B.4.1	There is no ID group dedicated to oceanic renewable energies (need for consortiums with foreign entities)	-3.0	-3.0	
Factor B.4.2	Maintenance costs	-3.0	-3.0	
Average		-3.0		-3.0
Category B.5 - Barriers related with social factors				
Factor B.5.1	Public perception against built infrastructures in the sea	0.0	0.0	
Factor B.5.2	Need to fix people (e.g. Pico Island)	-3.0	-3.0	
Average		-1.5		-1.5



Combination: Renewables & Tourism and Recreation & ID (data for MUSES, 2017)		Interviewee 4	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
NEGATIVE IMPACTS				
Category I.1 - Environmental impacts				
Factor I.1.1	Cumulative impacts during implementation	-1.0	-1.0	
Factor I.1.2	Visual impact	-3.0	-3.0	
Factor I.1.3	Noise pollution	-2.0	-2.0	
Average		-2.0		-2.0



Tourism and Recreation & Whaling Cultural Heritage Combination: Tourism and Recreation & Whaling Cultural Heritage (data for MUSES, 2017)		Interviewee 9	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
DRIVERS				
Category D.2 - Relation with other uses				
Factor D.2.1	Multiple synergies between WCH and tourism	3.0	3.0	
Average		3.0		3.0
Category D.3 - Economic drivers				
Factor D.3.1	Increasing eco-tourism	2.0	2.0	
Factor D.3.2	Need to diversify tourism sectors	3.0	3.0	
Average		2.5		2.5
Category D.4 - Societal drivers				
Factor D.4.1	Nautical sports activities using historic whaling boats	3.0	3.0	
Average		3.0		3.0
Category D.5 - Legal drivers				
Factor D.5.1	Regional legislation focused on conservation and management of whaling cultural heritage resources	3.0	3.0	
Average		3.0		3.0



Combination: Tourism and Recreation & Whaling Cultural Heritage (data for MUSES, 2017)		Interviewee 9	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
ADDED VALUES				
Category V.1 - Economic added values				
Factor V.1.1	Increase of local revenues related with tourist services	2.0	2.0	
Factor V.1.2	Diversification of tourism sector	2.0	2.0	
Factor V.1.3	Opportunity for tourism green-label certification	1.0	1.0	
Average		1.7		1.7
Category V.2 - Societal added values				
Factor V.2.1	Education and public awareness about WCH and its respective history	3.0	3.0	
Factor V.2.2	Relevant social cohesion	3.0	3.0	
Average		3.0		3.0
Category V.3 - Environmental added values				
Factor C.3.1	Lower impact use of historic whaling boats	2.0	2.0	
Factor C.3.2	Protection of resources associated with whaling historic materials	2.0	2.0	
Factor C.3.3	Education and public awareness of importance of WCH protection	3.0	3.0	
Average		2.3		2.3
Category V.5 - Technical added values				
Factor V.5.1	Maintenance of specialized professionals (e.g. traditional wooden naval architecture and carpentry conservation)	3.0	3.0	
Average		3.0		3.0



Combination: Tourism and Recreation & Whaling Cultural Heritage (data for MUSES, 2017)		Interviewee 9	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
		Score		
BARRIERS				
Category B.1 - Legal barriers				
Factor B.1.1	UNESCO Convention on the Protection of UCH	0.0	0.0	
Average		0.0		0.0
Category B.6 - Barriers related with environmental factors				
Factor B.6.1	Restriction/dependence on weather conditions	-1.0	-1.0	
Average		-1.0		-1.0



Combination: Tourism and Recreation & Whaling Cultural Heritage (data for MUSES, 2017)	Interviewee 9	Factor average for all stakeholders	Category average (average of all factors averaged for all stakeholders)
	Score		
NEGATIVE IMPACTS			



APPENDIX 2 SUPPORTING MATERIAL USED DURING STAKEHOLDER ENGAGEMENT

MU Definition and list of combinations (data for MUSES, 2017)

Multi-use definition

In the realm of marine resource utilisation, **multi-use should be understood as the intentional joint resource use by two or more different uses through one or more users**. It is an umbrella term that covers a multitude of combinations wherein a single user shares the same resource or different users operate side by side. The user/the users (if there is more than one party) or uses are mutually-connected - they have to take into consideration and understand each other’s inherent needs and capabilities. Hence, MU represents a radical change from the concept of exclusive resource rights to the inclusive sharing of resources by one or more users.

The shared marine resource in this context can be **geographical** (e.g. ocean space), **physical** (e.g. infrastructure or energy), **human** (e.g. same staff) or even **biological** (e.g. fish stocks). MU can vary in the degree of connection between users and uses as well as the drivers behind it. For a long term success of the concept of MU it is important that sharing of resources is sustainable, efficient and fair and offers clear benefits either directly to the users themselves (e.g. economic benefits) and/or to society at large (e.g. ecological benefits).

Interviewee

Name:

Institution:

List of multi-uses

Do you agree with current and potential multi-uses identified for the Azores?

Current MU	Yes/No	MU you would like to analyse
Fisheries + Tourism and Recreation		
Tourism and Recreation + Underwater Cultural Heritage + Environmental Protection		
Tourism and Recreation + Environmental Protection		
Scientific Research + Environmental Protection		
Potential MU		
Scientific Research + Defence		
Blue Biotechnology + Environmental Protection		
Renewable energy + Environmental Protection		
Renewable energy + Fisheries		
Renewable energy + Tourism		
Renewable energy + Aquaculture		
Aquaculture + Tourism		
Aquaculture + Environmental Protection		



Scoring system

Analysis of MU potential

DRIVERS (factors supporting / facilitating MU development / strengthening)

- | | |
|---|----------|
| • high priority | score +3 |
| • medium priority | score +2 |
| • low priority | score +1 |
| • not relevant (the factor is present, but it has no influence) | score 0 |
| • absent (the factor is not present) | score 0 |
| • I do not know | no score |

BARRIERS (factors preventing /negatively affecting MU)

- | | |
|---|----------|
| • high obstacle | score -3 |
| • medium obstacle | score -2 |
| • low obstacle | score -1 |
| • not relevant (the factor is present, but it has no influence) | score 0 |
| • absent (the factor is not present) | score 0 |
| • I do not know | no score |

Evaluation of overall MU effect

ADDED VALUES (positive effects of implementing / strengthening MU)

- | | |
|---|----------|
| • high added value | score +3 |
| • medium added value | score +2 |
| • low added value | score +1 |
| • not relevant (the factor is present, but it has no influence) | score 0 |
| • absent (the factor is not present) | score 0 |
| • I do not know | no score |

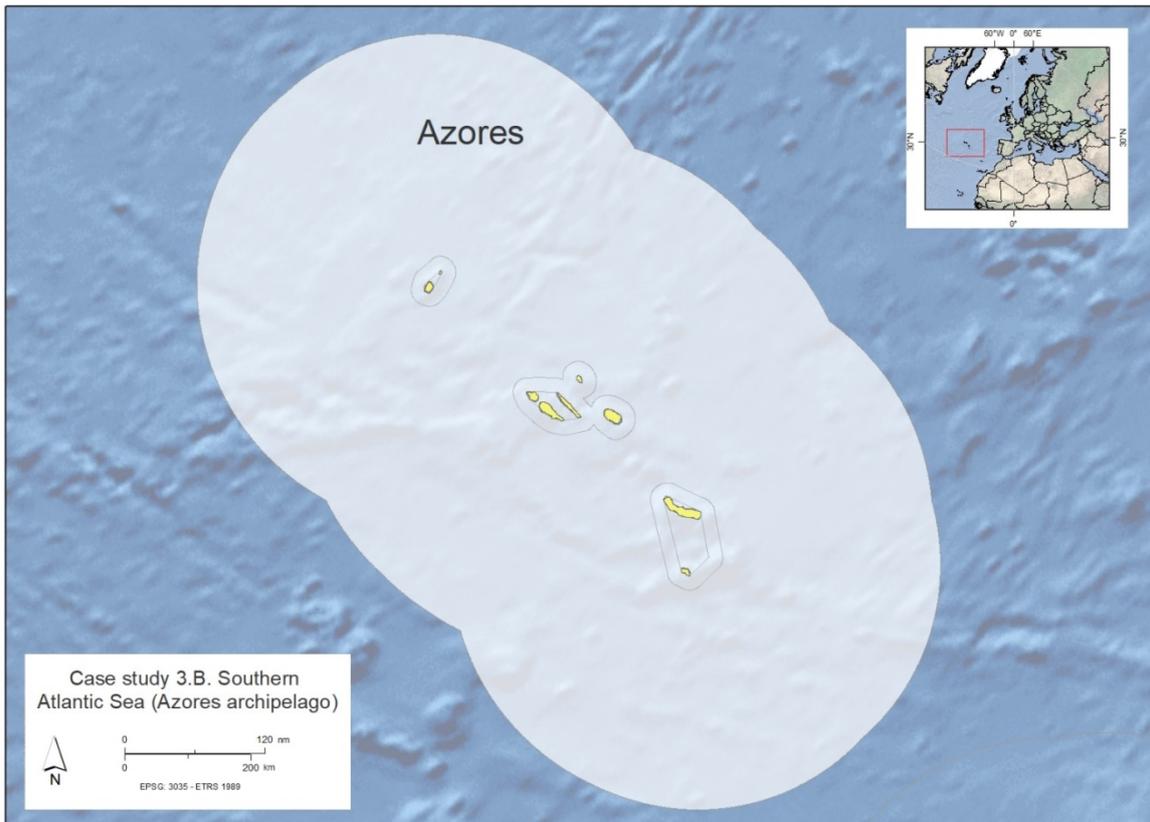
IMPACTS (negative effects of implementing / strengthening MU)

- | | |
|---|----------|
| • high impact | score -3 |
| • medium impact | score -2 |
| • low impact | score -1 |
| • not relevant (the factor is present, but it has no influence) | score 0 |
| • absent (the factor is not present) | score 0 |
| • I do not know | no score |



Azores Map (data for MUSES, 2017)

Interviewee:



Example of one the DABI tables pre-compiled for the interviews (data for MUSES, 2017)

Fisheries & Tourism and Recreation							
Description: This combination of fishery and tourism is traditionally also known as Pescaturism, defined as professional fishermen welcoming a certain number of tourists on to their boats in a tourism-recreation activity (rec. fishing) or tourists join professional small-scale fishers on board of traditional boats.							
Location: The Azores (Terceira, São Miguel and São Jorge) - Portugal							
Drivers	D	Added Values	A	Barriers	B	Impacts	I
D.1. Policy drivers	Sc	V.1. Economic	Sc	B.1. Legal barriers	Sc	I.1. Societal	Sc
Dedicated regional funds specific for pescaturism activity		Increase of local economy		Legal aspects concerning hygiene and security of passengers on the vessel			
“European Maritime and Fisheries Fund (EMFF)” for 2014-2020 has an aim of diversify fishing activity		Development of new market opportunities for both traditional fisheries and tourism (e.g. integrative income for fishers)		Need for a second licence			
“Melhor pesca, mais rendimento. Medidas estratégicas para o setor da pesca dos Açores 2015-2020” has an aim to diversify fishing activity with tourism		Extension of income season for both tourism and fisheries		Funding schemes are decentralized (e.g. national funds are subjected to specific regional development priorities)			
Limitation (e.g. quotas, closed seasons and not allowed areas) in fisheries activities		Diversification of tourism sector					
D.2.Relation between these uses	Sc	V.2. Environmental	Sc	B.2. Administrative barriers	Sc	I.2. Environmental	Sc
High number of maritime activities in the area – need to limit conflicts		Education and public awareness about state and issues of marine environment					
		More sustainable than the single use of traditional fisheries because there is a limited catch					
		Reduction of tourists in the coast (e.g. traditional beach tourism)					
D.3. Economic drivers	Sc	V.3. Technical	Sc	B.3. Barriers related with economic availability / risk	Sc	I.3. Economic	Sc
Tourism growth		Improvement of technical skills (e.g. fishers become tourist actors)		Concurrence with other tourism sectors		Concurrence for other tourism sectors (e.g. whale watching and recreational fishing)	
Financial incentive systems				Lack of adequate funding for startup of activity (e.g. buy material for ensuring security or pay a second licence and insurances)			



Low potential for fisheries' growth							
Ensure all year activity for fishermen and tourism							
Find new sources of income							
Increasing eco-tourism							
D.4. Societal drivers	Sc	V.4. Societal	Sc	B.4. Barriers related with social factors	Sc	I.4. Technical	Sc
Need to diversify fishing activity to maintain fishing communities identity		Involving fisher's family to help onshore		Resistance to change in small fishing communities			
		Conservation of traditional fisheries and their culture		Risks onboard (e.g., fall during recovering gear)			
		Education and public awareness about state and issues of fisheries, as well as fisher culture					
		Promotion of seafood diet					
		Opportunity for tourists to present a high degree of satisfaction (e.g. Sardinia – Italy)					
D.5. Legal drivers	Sc	V.5. Governance	Sc	B.5. Barriers related with environmental factors	Sc		Sc
National legislation focused on pescaturism				Current degradation of marine resources might impair the activity			
Regional legislation focused on pescaturism				Restriction/dependence on fishing ban periods			
Licence is issued in short time				Restriction/dependence on weather conditions			
Licence process for Pescaturism is similar to the process for commercial fishery							
D.6. Environmental	Sc		Sc	B.6. Barriers related with technical capacity	Sc		Sc
Public awareness of responsible fisheries and tourism activities				Lack of expertise to deal with tourists (e.g. language and communication skills)			
Need to reduce tourist pressure on the coast				Lack of expertise to develop organized economic business			
Reduction of fisheries exploitation				Need of logistic infrastructure in land (it can be a partner)			
				Lack of advertisement/publicity of the MU			
				Lack of on-line platform to contact the fishers			



Key Evaluation Questions (data for MUSES, 2017)

	Focus-Area-1 "Addressing Multi-Use"	Focus-Area-2 "Boosting Blue Maritime Economy"	Focus-Area-3 "Improving environmental compatibility"
	ORIGINAL		
12	<p>(1.2) Is space availability an issue for MU development/strengthening in the case study area at present? (Y/N). Will space availability become an issue for your area in the future? (Y/N). For what elements space availability is / could become an issue?</p>		
27	<p>(2.7) In order to promote MU development / strengthening in the case study area, - would the availability of a vision/strategy (e.g. at national or sub-regional level) be helpful? (Y/N) - would a feasibility study including evaluation of alternative scenarios be helpful? (Y/N) - would detailed projects on already identified simulations be useful? (Y/N)- do you see other enablers?</p>		
15	<p>(1.5) Are existing and/or potential MUs taken into account and valorised within the existing or under development maritime spatial plans? (Y/N)</p>	GOVERNMENT	



18	<p>(1.8) What action(s) would you recommend to develop / widen / strengthen MU in the case study area? What actor(s) do you see particularly important to develop / widen / strengthen MU in the case study area? (answers should be detailed enough to possibly allow undertaking actions finalized at MU promotion, at local case study level)</p>		
26	<p>(2.6) Is there sufficient dialogue between the stakeholder sectors for developing / widening / strengthening MU? (Y/N). Would dialogue facilitation be an asset? (Y/N)</p>		
14	<p>(1.4) What would be the most important resources to be shared between uses (infrastructures, services, personnel, etc)?</p>	<p>MAINLY ACTORS</p>	
22	<p>(2.2) Is it possible to quantify the socio-economic benefits related with MUs and how they (could) contribute to the sea economy at local and regional/national scale? What tools, knowledge, experiences are available?</p>		
23	<p>(2.3) Would MU development / strengthening be an opportunity for job creation and / or job requalification in your area? (Y/N)</p>		
24	<p>(2.4) Do you see possible elements of attractiveness for investors in developing / widening / strengthening MU in the case study area? (Y/N). What are these elements? (2.5) What are possible investors interested in developing / widening / strengthening MU in the case study area?</p>	<p>GOVERNMENT</p>	



33	<p>(3.3) Is saving free sea space for nature conservation a driver for MU the case study area? (Y/N). Are there evidences about the present and future benefits of reserving free sea space? (Y/N). What are they?</p>	GOVERNMENT	
34	<p>(3.4) What practical actions would you undertake to link MU development / widening / strengthening to improved environmental compatibility of maritime activities?</p>		
36	<p>(3.6) Is the environmentally friendly knowledge / technology for MU development/strengthening in the case study area available? (Y/N). Which is the level of readiness of available solutions? Are there still research needs on blue/green technologies for MU? (Y/N)</p>		
32	<p>(3.2) Which tools (conceptual, operational) are used or should be further developed and used to better estimate environmental impacts and benefits of MU?</p>	GOVERNMENT	
37	<p>(3.7) Would it be possible to promote MU through SEA/EIA procedures? (Y/N). What modifications would you suggest at your national / local level to promote MU through SEA/EIA procedures?</p>	GOVERNMENT	

