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Introducing a legal management instrument for offshore marine protected areas in the Azores—The Azores Marine Park

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ABSTRACT

The Azores Marine Park (AMP) proposal, developed by the Geographical Information and Territorial Planning Centre (Centro de Informação Geográfica e Planeamento Territorial; CIGPT) at University of the Azores (Ponta Delgada), was submitted in 2010 by the Azores Environment Agency to the Azores Parliament and will be implemented upon approval. This is the most recent effort towards establishing a Portuguese legal entity for consolidating and creating a coherent Azorean network of offshore marine protected areas (MPAs). The proposal included seven existing designated MPAs: four offshore habitats located within the Azorean Economic Exclusive Zone (EEZ; Banco Dom João de Castro seamount, Sedlo seamount, Lucky Strike hydrothermal vent field and Menez Gwen hydrothermal vent field), one located beyond the Azorean EEZ (Rainbow hydrothermal vent field), and two Marine Important Bird Areas (North of Corvo Offshore, and North of Corvo and Faial Offshore). These MPAs had been nominated by various conservation organizations and site-specific legally binding recommendations have been developed. AMP recommendations were created for each site according to strict protection objectives and management objectives adapted from the International Union for Conservation of Nature (IUCN) Protected Area Management Categories. Since its submission, three additional high seas MPAs in areas beyond national jurisdiction and subject to Portuguese continental shelf extension claims (Altair seamount, Antialtair seamount and an area of the Mid-Atlantic Ridge north of the Azores) were nominated in September 2010 by the OSPAR Commission. These MPAs have subsequently been proposed for inclusion in the AMP. With intensifying efforts to protect biodiversity, an increase in offshore Azorean MPAs is likely. Consequently, the AMP will likely extend its spatial limit to include new high seas MPAs and develop legally binding regulations for each new MPA as an on-going process. The full-scale “one-stop agency” AMP is envisioned to provide a representative offshore MPA network for the Azores that will protect all major ecosystem features in relation to their habitats and species, at an appropriate scale, within and across each bioregion.

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1. Introduction

The *Millennium Ecosystem Assessment* (2005) and *Census of Marine Life* (2011) identified degradation of marine living resources as a focal issue. While marine conservation is a major challenge for resource management and nature conservation policies, a successful tool for sustainable use and conservation of marine biological diversity and ecosystems has been the establishment of marine protected areas (MPAs). International and European recommendations in favour of an ecosystem approach prompted the need for an ocean management framework to achieve both biodiversity and sustainable use objectives. Based on these recommendations, MPAs were seen as key in defining Maritime Spatial Planning (MSP) and its framework (McLeod et al., 2005). The Convention on Biological Diversity (CBD) also identified MPAs as an important tool for achieving conservation and sustainable use of the sea. CBD (2006) considered the world's oceans to be seriously under-protected and found most MPAs were located within the first few miles offshore. According to IUCN-WCPA (2010), since 2003 the total protected ocean area has increased by over 150% and there were now approximately 5880 MPAs around the world, covering >4.2 million km² of ocean. However, this only accounts for circa 1.17% of global ocean area and protection is still largely focused on continental shelf areas, where MPA coverage is approximately 4.32% in comparison with 0.91% off-shelf (IUCN-WCPA, 2010).

In 2006, the International Union for Conservation of Nature (IUCN) made a convincing argument that to significantly reduce biodiversity loss by 2010, conservation, and sustainable and equitable use obligations of CBD Parties needed to be globally implemented. This included marine areas beyond national jurisdiction (ABNJ). According to IUCN (2006: 2), “these obligations include measures to protect representative, rare and threatened habitats and species, and the effective protection and restoration of biodiversity and ecosystem processes, including genetic resources of the deep seabed”. It also called for action to protect seamounts and cold water coral reef ecosystems, and encouraged MPA establishment in ABNJ. The latter included an interim prohibition of high seas bottom trawling, a policy adopted by the United Nations General Assembly to protect deep sea environments in regions where effective conservation and management measures have yet to be established. In 2008, CBD COP-9 Decision IX/20 (2008) provided guidance for identifying ecological areas and designing representative MPA networks. However, IUCN projected that unless progress is accelerated, the World Summit on Sustainable Development (WSSD) and CBD goals of establishing a representative MPA network will not be met until 2060 (Wood et al., 2008).

The Azores archipelago is a Portuguese autonomous region located in the North Atlantic, and is approximately 1500 km from Lisbon and 3900 km from the east coast of North America. It consists of nine volcanic islands located between 37°–40°N and 25°–31°W, distributed over a 600 km WNW-ESE strip. Despite its small land area, its Exclusive Economic Zone (EEZ) is approximately 940,000 km². To date, several ecosystems within Azorean waters have been designated as MPAs under the European Union (EU) Habitats Directive, European

initiatives and/or the OSPAR Commission (an international organisation which protects the North-East Atlantic marine environment). Some of these are legally binding under Azorean legislation while some are in the process of becoming so. However, multiple classifications by various agencies based on different criteria can lead to confusion when it comes to management and policy implementation. Ehler (2005) indicated that traditional MPA management in isolation from governance of the larger ocean and coastal areas, of which they are part, were “islands of protection”. This frequently resulted in a lack of success achieving MPA objectives, particularly when they are managed by various authorities using different implementation strategies and methodologies. Therefore, a coherent network of MPAs managed by one responsible authority, with homogenized legal management guidelines and implementation strategies, is seen as essential for effective regional MPA management. To address this need, in February 2010 the Geographical Information and Territorial Planning Centre (Centro de Informação Geográfica e Planeamento Territorial; CIGPT) of the University of the Azores (Ponta Delgada), submitted the Azores Marine Park (AMP) proposal to the Azores environment agency (Fig. 1).

CIGPT consolidated already designated MPAs and recently assigned Marine Important Bird Areas (MIBAs) within the AMP proposal. Its objective is the attainment of a comprehensive marine park that in future, as part of an on-going process, will include areas classified by international, European, regional and national conservation organizations, and new MPAs when supporting scientific information becomes available. Consequently, this paper starts by discussing international, European and regional MPA management tools and initiatives, and gives an overview of Azorean offshore MPAs, including those subject to Portuguese continental shelf extension claims. It subsequently presents an adapted IUCN category for Azorean marine areas, followed by the AMP development as a legal regional management tool. Finally, it considers challenges and makes recommendations for establishing a comprehensive and coherent ecological network of offshore MPAs in the Azores.

2. International, European and regional MPAs: management tools and initiatives

One of the most significant MPA milestones was the WSSD in 2002 and the CBD COP-7 in 2004, where firm commitments were agreed for establishing by 2012 a network of representative MPAs to address what was then considered to be inadequate protection of oceans and coasts. IUCN-WCPA (*World Commission on Protected Areas*, 2007) stated that “an MPA network can be defined as a collection of individual marine protected areas operating cooperatively and synergistically, at various spatial scales, and with a range of protection levels, in order to fulfil ecological aims more effectively and comprehensively than individual sites could alone.” Consequentially in 2008, IUCN established a new definition for protected areas which is also applicable to marine areas. IUCN-WCPA (2008a) stated that “a protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values”. This

revised definition specifically for MPAs, recognised and considered ecosystem functions and human activity impacts in three-dimensions.

In 2007, a guide for ecological criteria and biogeographic classification systems for marine areas in need of protection, specifically for high seas and ABNJ, was developed at the Azores expert workshop (IUCN-WCPA, 2008b). Consequently, CBD COP-9 Decision IX/20 (2008) presented criteria and guidelines, with various governments urgently recommending use of the scientific guide and application of criteria to achieve the 2012 objectives. The Decision also indicated scientific criteria (annex I to the Decision) for identifying ecologically or biologically significant marine areas (EBSAs) in need of protection, and scientific guidance (annex II to the Decision) for designing representative MPA networks. Furthermore, indicated a need to expedite the promotion of international cooperation for conservation and sustainable use of marine biological diversity in ABNJ. This included supporting Parties as well as competent international organizations on scientific and technical issues relating to EBSA identification. The Decision also adopted a revised and updated Strategic Plan for Biodiversity, including for the 2011–2020 period, the Aichi Biodiversity Targets. This new plan will be the overarching biodiversity framework, not only for biodiversity-related conventions, but for the entire United Nations system. COP-10 also agreed within two years, to translate this overarching international framework into national biodiversity strategies and action plans. The Aichi Biodiversity Target 11 stated that “by 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes” (CBD, 2011).

At the European level, Member States adopted legislation to protect their natural habitats, and wild flora and fauna under the EU Habitats Directive 92/43/EEC (1992) and the EU Birds Directive 79/409/EEC (1979) by establishing Special Areas of Conservation (SACs) and Special Protected Areas (SPAs). Together these contribute to the legal basis of the Natura 2000 EU-wide network of protected areas. In 2006, after the Malahide conference, the European Commission proposed concrete measures and stressed responsibilities of EU institutions and Member States to reach the 2010 target (European Commission, 2006). For the marine environment, this Action Plan stated: “complete marine network of SPAs by 2008; adopt lists of Sites of Community Importance (SCI) by 2008; designate SACs and establish management priorities and necessary conservation measures for SACs by 2012; establish similar management and conservation measures for SPAs by 2012” (Natura 2000, 2007). The European Marine Strategy Framework Directive 2008/56/EC (2008) also supported CBD’s objectives on halting biodiversity loss, and establishment and maintenance of ecologically representative MPA networks by 2012.

From a regional perspective, in June 2003 the environment ministers of OSPAR and Helsinki Commission Contracting

Parties committed by 2010 in both maritime areas, to establishing ecologically coherent networks of well-managed MPAs, including ABNJ accompanied by the Natura 2000 network (OSPAR, 2008). Applicable to the Azores, OSPAR also adopted “Recommendation 2003/3 on a network of marine protected areas” for selecting and managing an OSPAR network of MPAs, with the purpose of by 2010 establishing a representative MPA network in the North-East Atlantic (OSPAR, 2003). Its rationale is based on scientific and technical studies to establish conservation programmes and measures, such as designation of MPAs, species identification, habitats and ecological processes. OSPAR, in conjunction with other international and regional conventions, and some Non-Governmental Organizations (NGOs), presented concrete conservation goals and supported scientific studies for baseline information to define new policy. This is now enshrined in a North-East Atlantic Environment Strategy agreed in 2010 by OSPAR (OSPAR, 2010c), which accepted that the network extent established by 2010, representing 3.1% of the OSPAR Maritime Area, needed further evaluation in terms of coherence (by 2012) and management (by 2016; OSPAR, 2010d).

3. Offshore protected marine habitats and species, in and near Azorean waters

For offshore marine areas in the Azores, seamounts and hydrothermal vent fields are unique and sensitive ecosystems of high conservation value, and are particularly valuable for biodiversity preservation. Seamounts are defined as undersea mountains rising steeply from the seafloor to below sea level (Schmidt and Christiansen, 2004). Over the last decade, seamounts have been gaining global interest in scientific, industrial and environmental communities due to their enhanced productivity, high local biodiversity and growing natural resource exploitation (Christiansen and Wolff, 2009). A significant impact on benthic communities in some seamounts has also been observed (Collie et al., 2000; Koslow, 2001; Watson and Morato, 2004). In 2004, the Oceanic Seamounts: an Integrated Study (OASIS) reported that only two seamounts in the North-East Atlantic have been designated as MPAs and both are in Azorean waters (Schmidt and Christiansen, 2004). OASIS showed clear evidence of seamount effects on hydrography, biogeochemistry and biology in comparison to the surrounding ocean, and they may be good candidates for site-based management measures, including MPAs, due to their singularity and isolation (Schmidt and Christiansen, 2004). There has also been growing interest in the scientific, cultural and socio-economic value of Azorean hydrothermal vent fields. These fields, characterized with highly specialized species, are important due to their specificity and small spatial extent, and their site-specific communities make them highly vulnerable to increasing scientific and commercial exploitation. Consequently, OSPAR identified hydrothermal vents as a priority habitat in their list of threatened and/or endangered species and habitats (OSPAR, 2010b).

Another important offshore marine area in the Azores requiring protection is MIBAs. Pelagic seabirds (*Procellariiforms*)

Table 1 – Overview of MPAs included in the AMP.

MPAs	Overview
Banco Dom João de Castro Seamount (AMP Proposal, 2010; Ávila et al., 2004; Cardigos et al., 2005)	Banco Dom João de Castro, located along the MAR, is within the Azorean EEZ (Fig. 1) and situated between Terceira and São Miguel. Banco Dom João de Castro seamount is classified as a SAC under the Habitats Directive (PTMIG0021) and MPA under Azorean Legislation (Decree No. 20/2006/A). It is a submarine volcano composed of lava flows and submarine volcanoclastic deposits. It emerges at 1000 m depth, rising to circa 50 m where there is a gently-sloped and essentially sandy platform. A crater approximately 600 by 300 m, with a minimum depth 13 m, is near the plateau centre. Banco Dom João de Castro is very active from seismic and volcanic perspectives, displaying secondary forms of volcanism such as geysers, hot springs and a very high geothermal gradient. Although far from the coast, it is mainly used for commercial and sport fishing (deep-sea fishing). Furthermore, despite being primarily used by experienced divers, there is great interest in its use as a tourist dive site. It also has priority species, supported by its SAC classification, e.g. the birds <i>Calonectris diomedea borealis</i> and <i>Oceanodroma castro</i> (Angelito/Painho-da-Madeira); the turtle <i>Caretta caretta</i> and; and marine mammal <i>Tursiops truncatus</i> (Bottlenose Dolphin). This site is also one of the few places to have a seamount with shallow depth gas emanations, thus emphasizing its conservation and scientific importance.
Sedlo Seamount (AMP Proposal, 2010; OASIS, 2005; Schmidt and Christiansen, 2004; Santos et al., 2009)	Sedlo, located along the MAR, is within the Azorean EEZ (Fig. 1) and located circa 180 km north of Graciosa. The OASIS project (European Commission funded) included it as a case study to illustrate issues, actions and roles of science in seamount ecosystem management. Sedlo (75 km long and 30 km wide) is elongated in shape with three peaks rising from a depth of approximately 2800 m to 750 m, and is an excellent example of an isolated and detached seamount. Of note, it exhibits a flattened top, an uncommon feature in Azorean seamounts. Around thirty fish species have been identified in Sedlo and this represents 14% of all known fish species in the Azores. Unsurprisingly, it is an important reproductive area and important habitat for some visiting whales, dolphins, seabirds, loggerhead turtles, amongst others. There are few human activities, the main being scientific research.
Lucky Strike hydrothermal vent field (AMP Proposal, 2010; Desbruyères et al., 2001; Van Dover et al., 1996; WWF, 2006)	Lucky Strike, located along the MAR, is within the Azorean EEZ (Fig. 1). It was discovered in 1993 and is to date, one of the largest known active hydrothermal vent fields in the modern ocean. It is around 1700 m deep with 21 active chimney sites and depending on location, a hydrothermal fluid temperature ranging between 170 °C and 324 °C. Faunal composition is considered sufficiently unique to be biogeographically characterized as a hydrothermal province, the second in the MAR. One of the most studied, known as the Eiffel Tower, has dense mussel beds where to date, up to 66 species have been identified. The small surface area of vent sites suggested a need to manage human activities. Physical and chemical vent gas and water properties are distinct from other MAR sites due to low sulphur and high methane contents. Significant threats include an increase in geological and biological sampling; and bio prospection of genetic reservoirs and specialized hydrothermal vent fauna. Furthermore, high metal contents of “smokers” make them potential commercial mining hotspots and many scientific expeditions and programmes to investigate temporal and spatial geological and biological variability, have been undertaken at this relatively accessible site.
Menez Gwen hydrothermal vent field (AMP Proposal, 2010; Desbruyères et al., 2001)	Menez Gwen, discovered in 1991, is located along the MAR and within the Azorean EEZ (Fig. 1). This segment is characterized by the absence of a central rift and volcano. Circular in shape, it has a diameter of 17 km and height of 700 m, while at its summit is an axial graben, 6 km long, 2 km wide and 300 m deep. At the graben's northern end is a new volcano of diameter 600 m and height 120 m, composed entirely of fresh pillow lavas with no sediment cover. Menez Gwen is located near the top of this new volcano at the bottom of the graben at 840–870 m depth. Its hydrothermal fluids are characterized by temperatures ranging between 265 °C and 281 °C and these temperatures mark its characteristic physiochemical diversity and presence of anhydrite and barite. Faunal composition is dominated by large mussel colonies and one of the site's most prominent characteristic is the presence of bathyal fauna (fishes, cephalopods and crabs). Due to its proximity to the Azores and relatively accessible location, much scientific research has been carried out on Menez Gwen's spatial, temporal, geological and biological variability.
Rainbow hydrothermal vent field (AMP Proposal, 2010; Fouquet et al., 1997; Ribeiro, 2010; WWF, 2006)	Rainbow, located along the MAR, is approximately 235 nautical miles off the Azorean coast, and outside the Portuguese EEZ (Fig. 1). It is the largest known hydrothermal field in the MAR and was discovered in 1997. Located at a depth ranging from 2270 m to 2320 m, it is characterized by large spire edifices and hundreds of small chimneys. There are numerous inactive structures amongst a large number of rather short-lived active venting sites. Unlike neighbouring fields and many others on the MAR, the vents are situated on an ultramafic substrate which has been exposed by large-scale faulting. The field is considered spatially and temporally dynamic and in one year intervals, showed individual smoker changes. About 32 different species have been recorded in the Rainbow area, including several new ones to the MAR such as zoarcid fish species <i>Pachycara</i> sp. n. Due to the environmental conditions, the species community differs considerably between Rainbow and the two other shallower fields, Lucky Strike and Menez Gwen. <i>Bathymodiolus azoricus</i> and <i>B. seepensis</i> mussel species dominate communities on surrounding blocks within the active area. Several other species like the shrimp <i>Mirocaris fortunata</i> and polychaete <i>Amathys lutzi</i> are found. Although located at great depth, numerous scientific expeditions have been carried out and it is the only vent field in MAR to be visited by tourism operators. Different investigations such as long-term monitoring activities, scientific experiments and geological sampling interfere with each other and other activities like tourism and mining. As little is known about the ecosystem structure, impacts of human interference are unpredictable.

Table 1 (Continued)

MPAs	Overview
North of Corvo Offshore MIBA (AMP Proposal, 2010; Ramírez et al., 2008)	The North of Corvo Offshore MIBA is located in the western Azores, approximately 135 km from Corvo island, and has an area of circa 2,689 km². It is near a large seamount that might promote upwelling, thereby increasing productivity. This MIBA did not have any legal protection at the time of proposal submission and has been designated for the protection of Cory's Shearwater. Both Corvo and Faial populations use this area for resting and feeding. It is used by individuals from the Faial population during incubation periods and the following year, by Corvo individuals for feeding during the chick-rearing stage. The population based on 2005–2007 data, indicated 90,000 Cory's Shearwater in Corvo and Faial's breeding populations. As the seamount is still some distance away from this area, there seems to be a strong observed effect from the seafront, contributing to gathering of adult Cory's Shearwaters. It is therefore necessary to monitor the yearly occurrence of this front and to study its influence on the shearwater gathering, by carrying out marine surveys and on-going studies using data-loggers. This area was visited by individuals from different colonies in two years, suggesting it is an important feeding ground. Behavioural changes in species movement patterns could indicate oceanographic or distribution and abundance changes of potential Cory's Shearwater prey in this ecosystem. Therefore, continuous monitoring of this location is recommended. It is also important to check how much this area is used by the fishing fleet, so as to understand the extent of fishing in this area. To date, marine surveys have not been carried out here.
North Corvo and Faial Offshore MIBA (AMP Proposal, 2010; Ramírez et al., 2008)	The North of Corvo and Faial Offshore MIBA is located between the western and central Azores group of islands, approximately 225 km from Corvo and 320 km from Faial. It has an area of approximately 2,600 km², and is located near a large seamount and in the Azorean cold and warm water mixing zone. These transition areas are frequently associated with higher productivity and therefore, higher concentrations of prey. The MIBA was designated for the protection of Cory's Shearwater and did not have any legal protection status when the proposal was submitted. Both Corvo and Faial populations use this area for resting and feeding; and it was also designated due to regular use by breeding populations from Graciosa and Corvo islands. Birds flying to this area remain for up to 20 days. Area productivity may be related to upwelling that is promoted by sudden changes in the seabed floor. However, other events should not be excluded as being potentially responsible for this habitat's increased productivity. Consequently, more research is needed to understand this ecosystem. A simple and effective way of monitoring would be to deploy data-loggers on central group Cory's Shearwaters, increasing sample size and time-frame, and extending such sampling to all phases of the breeding period. It is also important to determine area usage by the fishing-fleet, in order to quantify and assess fishing consequences.
Altair Seamount, Antialtair Seamount and an Area of the MAR North of the Azores (OSPAR, 2010a,e,f,g)	Altair and Antialtair seamounts are located north-west and north-east of the Azores respectively, close to the MAR. The seabeds of these three MPAs are included in a submission from Portugal to CLCS, in accordance with Article 76 Annex II of UNCLOS, which includes high seas superjacent to the seabed. At the Bergen meeting in September 2010, they were nominated as high seas MPAs (OSPAR, 2010a), subsequent to the proposal submission. The OSPAR decision to establish these MPAs will enter into force on 12 April 2011. Consequently, they have been submitted as new MPAs for inclusion in the AMP.

that visit land for only short time periods are the most representative of the ocean ecosystem and are yet the least understood (Ramírez et al., 2008). The Azores seabird, a transition between tropical and temperate birds, is important for biodiversity conservation. Other Azorean bird species included in the EU Birds Directive include: Madeiran storm petrel (*Oceanodroma castro*), Roseate tern (*Sterna dougallii*), Cory's shearwater (*Calonectris diomedea borealis*), Common tern (*S. hirundo*), and Little shearwaters (*Puffinus assimilis*; Natura 2000, 2007). These species are threatened by introduced predators, tourism disturbance, soil erosion and vegetation degradation, which have led to losses of nesting habitats and hence breeding pairs. Cory's Shearwater is the most abundant species in the Azores and this region has the largest population in the world (Monteiro, 2000; BirdLife International, 2004). In recent decades, conservation has focused largely on studying and protecting breeding colonies due to threats many face on land, such as nest predation by alien species and habitat loss, and due to the logistics and technical difficulties associated with monitoring and tracking these birds at sea (Ramírez et al., 2008).

Applying the Birds Directive to the marine environment is complex with respect to identifying suitable areas for SPA designation, as they are mainly offshore and far from coastal ecosystems. Key difficulties encountered designating European marine SPAs arise from the lack of information due to high costs of pelagic marine investigation. Therefore, there is limited knowledge of unique marine ecosystem dynamics and extent of human area usage (Ramírez et al., 2008). Portugal, particularly with its vast marine area, has a huge knowledge gap. The November 2004 conference at Bergen-op-Zoom on the Birds Directive highlighted significant gaps in bird SPA designation and recommended full extension of the SPA network to the marine environment. It also recommended initiating an effective protection regime, with management objectives in place for all areas by 2010. To date, eleven MIBAs have been identified within the Azorean EEZ, nine of which are considered as seaward extensions of breeding colonies and two of them, located towards the north, are considered as offshore foraging areas (Ramírez et al., 2008).

3.1. MPAs within the AMP proposal

At the time of submission, seven existing offshore MPAs designated by international, European, regional and national organizations, were included in the AMP Proposal (2010). They included: four offshore habitats located within the Azorean 200 nautical miles (nm) EEZ (Banco Dom João de Castro seamount, Sedlo seamount, Lucky Strike hydrothermal vent field and Menez Gwen hydrothermal vent field); one offshore habitat located 35 nm beyond the Azorean EEZ (Rainbow hydrothermal vent field); and two MIBAs (North of Corvo Offshore, and North of Corvo and Faial Offshore). The two MIBAs within the Azorean waters were recently identified by the Portuguese Society for the Study of Birds (Sociedade Portuguesa para o Estudo das Aves; SPEA) and are currently submitted for classification as SPAs under the EU Birds Directive 79/409/EEC (1979). Although not having official MPA status, they were included in the AMP due to their importance for protection of the Cory's Shearwater. An

overview of these MPAs with existing and potential threats is presented in Table 1.

3.2. High seas MPAs in proximity to the Azores Archipelago

At CBD COP-8 in 2006, IUCN (2006) recommended parties to implement new or improved instruments to achieve enforceable MPAs, including ABNJ within the United Nations Convention on the Law of the Sea (UNCLOS) framework. Article 76 (UNCLOS) states that the jurisdiction of its subscribed members could be extended beyond the 200 nm limit, where and when they satisfy the established prerequisites (UNCLOS, 2010). Annex II of Article 76 states the inclusions of high seas that are superjacent to the seabed are subject to this submission. Correspondingly, the Task Group for the Extension of the Portuguese continental shelf (A Estrutura de Missão para a Extensão da Plataforma Continental; EMEPC), created by the Cabinet Resolution of the Council of Ministers n° 9/2005, on 11 May 2009 submitted a proposal to the Commission on the Limits of the Continental Shelf for extending the Portuguese continental shelf (CLCS; CLCS, 2010).

Consequently, the AMP proposal (2010) extended its limit to include Rainbow hydrothermal vent field which is located beyond the EEZ. This is the first national MPA proposed in the high seas, and was acknowledged by OSPAR (2006) before the CLCS outcome, as being under Portuguese jurisdiction. Additional MPAs in ABNJ, nominated after the AMP proposal submission, have also been submitted for inclusion. These include three OSPAR high seas MPAs with seabeds within the Portuguese CLCS submission (Altair seamount, Antialtair seamount and an area of the mid-atlantic ridge (MAR) north of the Azores), which were nominated at the OSPAR ministerial meeting in September 2010 (OSPAR, 2010a,b). Josephine seamount, was also nominated at the meeting, but is under the jurisdiction of mainland Portugal, and therefore not included in the AMP.

4. Development of the AMP as a legal management instrument

The Azores regional network of protected areas under Azorean Legislative Decree No. 15/2007/A (2007) consists of two administrative organizations: the Island Natural Park (INP) which is responsible for the protected areas network of each island up to its 12 nm Territorial Seas (TS) limit, and the AMP which is responsible for offshore MPAs from the TS limit of each island to the Azorean EEZ limit (and beyond, subject to the Portuguese CLCS submission), making a total of nine INPs and one AMP (Calado et al., 2009; Fig. 1). Most Azorean MPAs are located near the coast within the TS limit (INP), where more research is usually undertaken due to accessibility and pressures from anthropogenic activities. Management implementation also tends to be more feasible the closer the MPA is to the coast. Based on this reasoning, designating offshore MPAs beyond the TS limit will be relatively less extensively researched. However, the international call to focus scientific research in the open sea, deep sea, high seas and ABNJs is leading to more discoveries

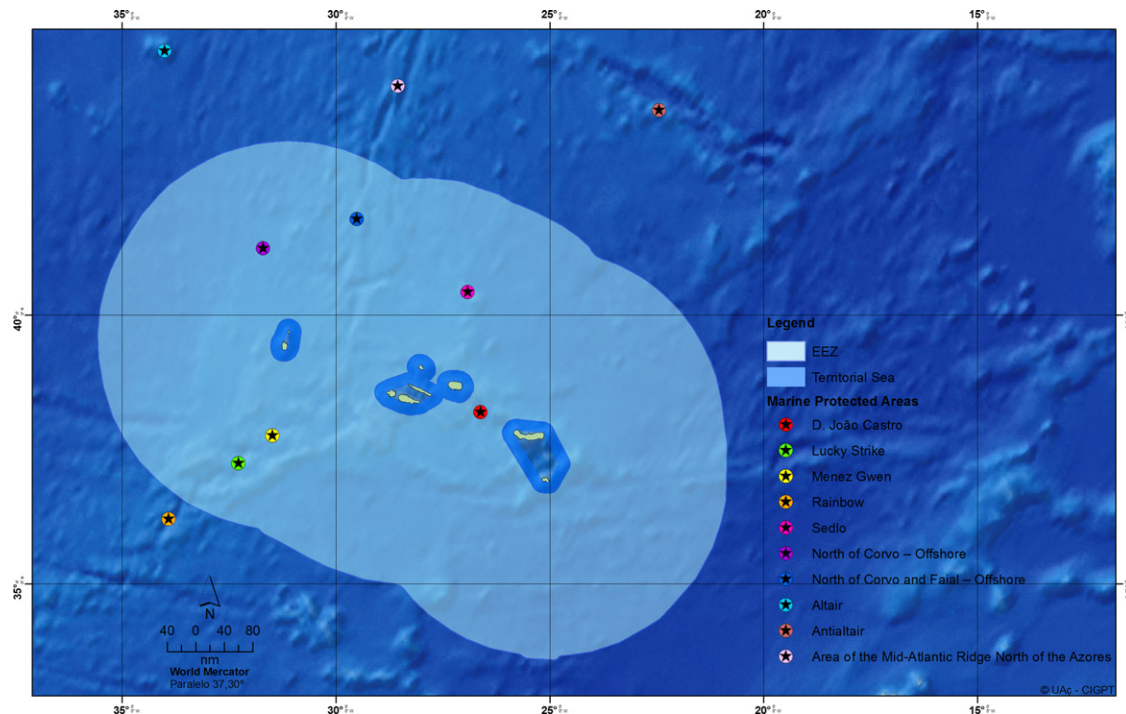


Fig. 1 – The AMP.

of vulnerable North-East Atlantic ecosystems that need urgent protection.

Establishing an Azorean regional legislative decree for the AMP will define its extent and scope, and provide a legal instrument to manage all MPAs in the Azores. The AMP will also implement programmes and measures specific to each marine area. MPA classification in the Azores is aimed at: maintaining and preserving marine biodiversity; and implementing measures for protection, recovery and sustainable use of marine resources, including harmonious integration of human activities and scientific studies. To achieve these objectives, the AMP management instrument needs to incorporate the following: (1) adopting measures directed towards the protection of hydrothermal vents, seamounts and other undersea structures, as well as community resources and sensitive marine habitats; (2) managing designated protected Azorean hydrothermal vents, seamounts and other undersea structures including those that may be designated in the future; and (3) Holistically managing the AMP, including its habitats, resources, species, ecosystems while recognising their complementary nature.

Stakeholder participation and endorsement of the AMP process is critically important to ensure its success. Therefore, the lack of any reference to address local community and stakeholder desires or expectations as one of its main objectives indicates a likely future obstacle implementing the AMP. Throughout recent history, Portuguese government agencies have not recognized the importance of and consequently not acted upon public participation and community engagement in environmental planning and management. Once again this has been demonstrated by the regional government arguing that public participation is time-consuming and should be delayed as a future action in the AMP

establishment process. Legal processes for MPA establishment in Portugal and the Azores traditionally do not negotiate or participate with local populations. However, this has proven counter-productive and has produced negative sentiments amongst communities and stakeholders. Conversely, areas with no legal protection status but had involved communities and stakeholders in their management plans, have achieved a good public understanding and acceptance. This is confirmed by Jenkins et al. (2009) who concluded that gaining widespread community support was vital for any conservation effort. Therefore, it is strongly recommended that the environment agency consider this is currently a major oversight in the planning process and adopts public participation to develop a negotiated management plan, prior to its implementation.

4.1. Adapting IUCN protected area management

The Azores regional network of protected areas is an innovative system in Portugal, and is based on management criteria under a single island-wide governing body. This standardizes different names that were created under various legal contexts and developed at different times (Calado et al., 2009). This form of management allows assignment of a more appropriate statutory level of protection, based on existing assets that need protecting, be they natural or cultural. Classification of different MPA types in relation to management objectives (IUCN, 2006) and not strictly based on protection objectives allows for a greater range of options towards more adaptive and innovative methodologies, i.e. instead of typical “No-take zone” or “Highly Protected Marine Reserve” designations. Primary and secondary management objectives having potential application, i.e. criteria underlying the IUCN category system are presented in Table 2. CIGPT

Table 2 – AMP protected area management category.

AMP category	AMP management objectives
I Marine Nature Reserve	-Preservation of habitats, ecosystems and species; -Maintenance of ecological processes; -Protection of structural and geological marine landscape features; -Preservation of natural marine environments especially where selected for scientific study, monitoring and education; -Definition of limits and constraints to public access.
III Natural Marine Monument	-Scientific studies of marine protected areas; -Valuing and preserving marine space: including development of responsible regulations to prevent natural heritage destruction; -Activity designation within the MPA and its environs.
IV Habitats or species management area	-Maintain conditions of habitats necessary to protect significant species, biotic communities or physical characteristics of the marine environment, noting places where human intervention is necessary to optimize management; -Promote scientific research and environmental monitoring activities deemed essential to sustainable management; -Create and define marine areas that are designated for knowledge enhancement, enabling studies of protected habitat characteristics; -Regulate uses and activities that may pose threats to habitat and species sustainability; -Allow local people to enjoy the benefits from activities that are compatible with MPA management objective.
V Seascape area	-Preserve harmonious interaction between marine seascape protection, traditional use, resource exploitation and other activities; -Support the development of livelihoods and economic activities, while preserving local traditions; -Maintain and preserve diversity of marine seascape, species, habitats and ecosystems. -Regulate use and activities to minimise threats; -Encourage appropriate tourism and leisure activities in accordance with regional characteristics; -Promote scientific and educational activities that contribute to population welfare and develop public support for environmental protection; -Contribute to local community development through benefits provided by services and sale of natural products.
VI Managed resource area	-Protect biodiversity and other natural assets; -Promote effective management for sustainable resource use, including environmental impacts of fishing and other activities; -Contribute to sustainable regional development.

Source: Adapted from IUCN Category; IUCN-WCPA (1994, 2008a).

established a direct correlation between legislative protection statutes and IUCN category, and identified appropriate management objectives for each category (Table 2). The Azores does not have a marine national park between the TS and EEZ limits and therefore Category II (MPA for National Park) is not applicable.

Managing MPAs within the AMP can vary from stricter for science or wilderness values, where extractive activities should be excluded, to broader for sustainable use of natural resources and ecosystems. The AMP Category in Table 2 provides a system to differentiate management levels for each category, and based on this system MPAs were classified accordingly (Fig. 2). The core zones of Banco Dom João de Castro and Sedlo, being important marine nature reserves for scientific investigation are classified under Category I, while their outer-rims, Lucky Strike, Menez Gwen, Rainbow, Altair, Antialtair and an area of MAR north of the Azores, are classified under Category VI to ensure sustainable use of natural ecosystems and resources. The North of Corvo Offshore and North of Corvo and Faial Offshore MIBAs, being bird habitats and species protected areas, are classified under Category IV to ensure conservation through intervention

management. Currently, there are no natural marine monument and seascape MPAs in the Azores, and consequently no MPAs are classified under Categories III and V. However, to avoid future time-consuming legal procedure, these categories should be indicated in the legal document to accommodate any future change.

Consequently, a detailed set of legally binding guidelines and regulations was established for each of the seven MPAs and submitted in the AMP proposal. Main challenges during this phase included: addressing the three-dimensional characteristics of the sea (surface, water column and sea bottom); the multi-directional flow of the sea (tides and currents); suggesting right of access and use of areas, understanding that marine areas are considered “common” to all users; considering and protecting according to seasonality and migration dynamics (e.g., protection of fish breeding sites or marine mammal migration routes); understanding that monitoring and surveillance of activities in the AMP are difficult (requiring expensive technology and human resources); and taking into account large scale marine connectivity. Vertical zoning was one of the greatest challenges in planning marine areas as the protection of

Table 3 – Current Proposed MPAs in the AMP (European Commission, 2009; AMP Proposal, 2010; OSPAR, 2010a; Ramírez et al., 2008; WWF, 2006).

MPA	AMP adapted IUCN category	Main ecosystem feature	Existing protection status	Location	Jurisdiction
Banco Dom João de Castro	I (core zone); VI	Seamount	-Classified as SAC under the Habitats Directive (PTMIG0021) -Classified as protected area under Azorean Legislative Decree No. 20/2006/A.	38.2°N; 26.6°W	Within Azorean EEZ
Sedlo	I (core zone); VI	Seamount	-Designated as MPA under OSPAR	40.4°N; 26.9°W	Within Azorean EEZ
North of Corvo – Offshore	IV	MIBA	-Designated as MIBA under SPEA	41.2°N; 31.7°W	Within Azorean EEZ
North of Corvo and Faial – Offshore	IV	MIBA	-Designated as MIBA under SPEA	41.7°N; 29.5°W	Within Azorean EEZ
Lucky Strike	VI	Hydrothermal vent field	-Classified as SCI under the Habitats Directive (PTMAZ0002) -Designated as MPA under OSPAR	37.3°N; 32.3°W	Within Azorean EEZ
Menez Gwen	VI	Hydrothermal vent field	-Classified as SCI under the Habitats Directive (PTMAZ0001) -Designated as MPA under OSPAR	37.8°N; 31.5°W	Within Azorean EEZ
Rainbow	VI	Hydrothermal vent field	-Designated as MPA under OSPAR	36.2°N; 33.9°W	Beyond Azorean EEZ (Acknowledged as part of Portuguese jurisdiction by OSPAR (2006) ; seabed claims to be part of Portuguese jurisdiction (CLCS, 2010))
Altair	VI	Seamount	-Designated as MPA under OSPAR	44.6°N; 34.0°W	Beyond Azorean EEZ (Recently acknowledged as part of Portuguese jurisdiction by OSPAR (2010a) at the Bergen meeting; seabed claims to be part of Portuguese jurisdiction (CLCS, 2010))
Antialtair	VI	Seamount	-Designated as MPA under OSPAR	43.6°N; 22.4°W	Beyond Azorean EEZ (Recently acknowledged as part of Portuguese jurisdiction by OSPAR (2010a) at the Bergen meeting; seabed claims to be part of Portuguese jurisdiction (CLCS, 2010))
An area of the MAR north of the Azores	VI	MAR	-Designated as MPA under OSPAR	44.0°N; 28.6°W	Beyond Azorean EEZ (Recently acknowledged as part of Portuguese jurisdiction by OSPAR (2010a) at the Bergen meeting; Seabed claims to be part of Portuguese jurisdiction (CLCS, 2010))

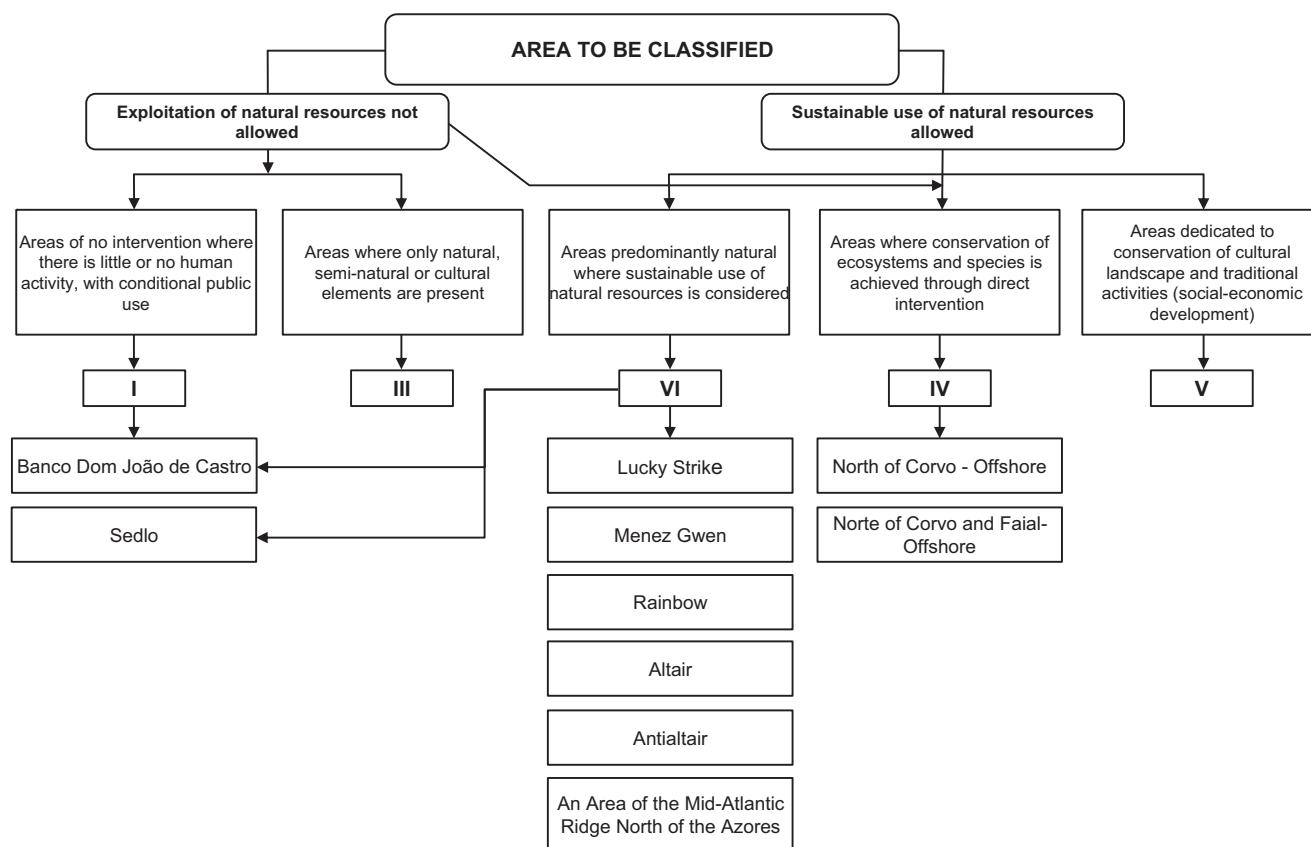


Fig. 2 – AMP category for each MPA based on the IUCN methodology.
Source: Adapted from Calado et al. (2009).

benthos is conditional on use of the pelagic system. Due to the difficulty in quantifying the inter-relationship between these systems and in line with the IUCN-WCPA recommendation, vertical zoning was kept minimal. In marine areas where this regulation applies, IUCN-WCPA (2008a) recommended classifying the area according to the least restrictive management regime. It is important to note that MPA development is somewhat controversial due to general rapid assumption that public areas will be closed to all activities because of past experiences of strict zoning rules. Therefore, it is extremely important to clearly define methodologies that are appropriate in relation to management interests and objectives. This highlights the benefits and importance of implementing MPA management according to local requirements. A summary of the designated MPAs to be included in the AMP is presented in Table 3. Methodologies for developing the regulations and those for individual MPAs are however beyond the scope of this paper.

5. Conclusions and recommendations

The need to develop a local “one-stop agency” to oversee potentially all offshore MPAs within Azorean jurisdiction was the main driving force behind CIGPT’s AMP proposal. Another important rationale for its development was founded on the need to translate legislation (international or regional) into

Portuguese law for perception by the general public as legally binding regulations. Hard laws such as the Habitats Directive or soft laws such as OSPAR MPA designation are not perceived as compelling Portuguese citizens to comply. Therefore, the AMP being a Portuguese legal entity will be more effective in achieving public compliance and consequently, it will play an important role in Azorean ocean conservation and management. Upon submitting the AMP proposal, CIGPT recommended that the Azores environment agency discussed the proposal with stakeholders before submission to parliament for approval. Unfortunately, the agency bypassed the stakeholder discussion phase and submitted proposed legal MPA management guidelines and legislation within the AMP. These are currently in the process of being approved. Based on the authors’ experiences, top-down implementation without any stakeholder participation is unlikely to yield effective management implementation. Therefore, it is strongly recommended that the environment agency discusses the legislation, once approved, with stakeholders to develop a negotiated management plan, making changes to the legislation accordingly. To further illustrate the importance of stakeholder participation in the Azores, the recommended closing of fisheries at Condor seamount for three years (initiated by the Department of Oceanography and Fisheries at University of the Azores) and voluntary closing of fishing by the fisheries sector to preserve their diving site at Caneiro dos Meros in Corvo island, showed the effectiveness of bottom-up efforts.

Without doubt, science-based conservation is the most desirable approach, but it is often a luxury that most places do not have, particularly in open sea areas. Scientific open sea research still has many data gaps and consequently, it was a challenge to balance delaying the AMP establishment until more scientific information was collected, with a policy to proceed based on existing data. Considering the number of offshore MPAs already designated within Azorean jurisdiction, CIGPT reckoned there was sufficient information to proceed with a first-approach AMP legal management framework. It is important to note that it is not the initial intention to research and include all offshore marine areas that require protection. Rather, the AMP goal is to design a feasible legal management instrument, applicable to the Azores, by analyzing a representative set of already designated offshore MPAs within its jurisdiction. Considering the lack of ecosystem data, the AMP becomes an important marine habitat and biodiversity stakeholder that can represent the level and extent of ocean conservation and resource protection.

Going forward, there is likely to be an increase in new offshore MPA designations promoted by various conservation organizations, as implied by the OSPAR 2010 Quality Status Report (QSR) and the Bergen statement (OSPAR, 2010a,b). OSPAR's 2010 QSR (2010b) indicated that the goal of significantly reducing biodiversity loss by 2010, as agreed at the WSSD in 2002, had not been achieved. The Bergen statement reiterated the need for contracting parties to intensify their effort in conserving and managing vulnerable ecosystems through diverse use of approaches and tools, including the establishment of MPAs and representative MPA networks by 2012 (OSPAR, 2010a). Additionally, the statement expressed the ministers' commitment to identify and protect ecologically significant and/or vulnerable deep-sea and high seas ecosystems in the wider Atlantic. Correspondingly, the AMP will need to adjust its spatial extent to include newly nominated high seas MPAs within its potentially extended jurisdiction, pending the outcome of the Portuguese CLCS submission. Once the AMP legal management structure is in place, legally binding regulations will be developed on an ongoing basis for each newly-designated MPA, these being coherent with other MPAs.

The envisioned full-scale AMP is intended to provide a comprehensive, adequate and representative offshore MPA network for the Azores that will protect all major ecosystems in relation to habitats and species, at an appropriate scale, within and across each bioregion. The appropriate management level to ensure ecological viability and integrity and full range of human activities will be comprehensively addressed for each MPA. Understanding that economic activities tend to win over biodiversity conservation interests, implementing an appropriate management plan can be challenging without strict rules and effective enforcement in association with public outreach. It is also important to consider and integrate the AMP into the on-going Portuguese MSP. As indicated by Calado et al. (2010), MSP initiatives clearly demonstrate a generally accepted need and importance of managing increasing demands on maritime space concurrently with the need to preserve and protect marine ecosystems. Furthermore, with marine habitats and biodiversity being cross-border, it is vital to consult and cooperate with

neighbouring countries or regions for effective implementation of MPA management guidelines.

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