

Elements for a future EBSA (Ecologically or Biologically Significant marine Area) process in the Alborán Sea and connected areas. A case study for north-south cooperation

Daniela TALAMO¹ and Rodrigo RIERA^{2,3*}

(¹) *Freelance, Rome, Italy*

(²) *Facultad de Ciencias, Universidad Católica de la Santísima Concepción, Concepción, Chile*

(³) *Centro de Investigación en Biodiversidad y Ambientes Sustentables (CIBAS), Universidad Católica de la Santísima Concepción, Concepción, Chile*

**Corresponding author: rriera@ucsc.cl*

Abstract: The political shape of the Alborán region is characterized by a clear division between the north and south coasts, and national interests predominate both north and south in terms of the maritime map, with a resulting mosaic of jurisdictions that facilitates neither bilateral nor multilateral agreements. The delimitation between different jurisdictions in the Alborán Sea rises to what could be termed a “jurisdictional asymmetry”, a consequence of the heterogeneous nature of the legal systems of adjacent jurisdictions. The north-south asymmetry can also be seen in the existence of two distinct and greatly differing socio-economic and cultural models. The north has high or very high human development indicators, whereas south has average human development indicators. All these factors are a source of instability and have a significant impact on the way in which political relationships interact in the Alborán Sea. An integrated governance framework as set out in Ecologically or Biologically Significant Marine Areas (EBSAs) process may offer appropriate horizontal tools to help policy makers and economic and environmental actors to join up their policies, interlink their activities and optimize the use of marine and coastal space in an environmentally sustainable manner.

Résumé : *Éléments pour une future mise en place d'EBSA (aire marine d'intérêt biologique ou écologique) en Mer d'Alboran et ses zones adjacentes. Une étude de cas pour une coopération nord-sud.* La structure politique de la région d'Alboran est caractérisée par une séparation nette entre les côtes nord et sud et les intérêts nationaux dominant le nord et le sud en termes de géographie maritime, avec pour conséquence une mosaïque de juridictions qui ne facilitent les accords ni bilatéraux ni multilatéraux. La délimitation des différentes juridictions en Mer d'Alboran y est asymétrique, une conséquence de la nature hétérogène des lois des juridictions adjacentes. Cette asymétrie nord-sud peut également être perçue à travers les fortes différences des deux modèles culturels et économiques. Le nord est caractérisé par des indicateurs de développement humain forts à très forts alors que le sud l'est par des indicateurs moyens. Tous ces facteurs représentent une source d'instabilité et ont un impact significatif sur la façon dont les relations politiques interagissent en Mer d'Alboran. Une gouvernance intégrée d'EBSA pourrait offrir des outils adaptés pour aider les décideurs et les acteurs économiques et de l'environnement à go-gérer leurs politiques, lier leurs activités et optimiser l'utilisation de l'espace marin et côtier par une approche durable pour l'environnement.

Keywords: EBSAs • Marine Protected Areas • Maritime spatial planning • Governance • Ecosystem approach • Cross-border Cooperation • Alborán Sea

Introduction

Coastlines are shared between states, making necessary the governance of marine ecosystems (van Tatenhoven, 2017). Individual states are responsible for the implementation of marine spatial planning (MSP) of their exclusive economic zones (EEZ) (Douvere & Ehler, 2009; van Tatenhoven, 2017). In 2006, the Conference of the Parties (COP) to the Convention of Biological Diversity (CBD) called for the convening of an expert workshop “*to refine and develop a consolidated set of scientific criteria for identifying ecologically or biologically significant marine areas in need of protection in open-ocean waters and deep-sea habitats, building upon existing sets of criteria used nationally, regionally and globally*” and following the conclusions, adopted in 2008 seven scientific criteria for the identification of EBSAs (ecologically or biologically significant marine area) in need of protection in open-ocean waters and deep-sea habitats (CBD, 2006 & 2008; UNEP, 2008), together with scientific guidance for selecting areas to establish a representative network of MPAs (CBD, 2008).

In 2009, the ninth meeting of the CBD-COP9 adopted the following scientific criteria for identifying ecologically or biologically significant marine areas in need of protection in open-ocean waters and deep-sea habitats. The criteria were the following: (i) Uniqueness or rarity, (ii) Special importance for life history stages of species; (iii) Importance for threatened, endangered or declining species and/or habitats; (iv) Vulnerability, fragility, sensitivity or slow recovery; (v) Biological productivity; (vi) Biological diversity; (vii) Naturalness. The five key network properties and components were: (i) Ecologically and biologically significant areas, (ii) Representativeness; (iii) Connectivity, (iv) Replicated ecological features, (v) Adequate and viable sites.

In 2010, the tenth meeting of the CBD-COP 10 promote the EBSA process following the CBD methodology to facilitate collaboration between scientists and governments enhancing the current knowledge on marine biodiversity in coastal waters and open seas, scheduled a series of regional workshops. The Regional Workshop of the Mediterranean region agreed on the description of 17 areas meeting EBSA criteria, among them the Strait of Gibraltar, Alborán Sea and connected Spanish, Moroccan and Algerian areas. In 2014, despite the positive results of this workshop, the COP 12 of CBD governments have not reached an agreement in the same direction, therefore, to date, it appears not feasible the creation of an EBSA area in the Alborán Sea.

Nevertheless, this study aims to renew and underline the importance and value added of creating an EBSA to support more and better cooperation in the policies of conservation and sustainable development of the Mediterranean Sea.

The study region includes the Strait of Gibraltar, Alborán

Sea and connected Spanish, Moroccan and Algerian areas towards the east. The boundaries of the area are defined to the west as proposed by the Barcelona Convention and RAC/SPA, and to the east with a line joining Cape of Águilas (Spain) to Algeria. The area has a complex hydrology due to the confluence of Atlantic and Mediterranean waters and the diverse seafloor geomorphology, with a heterogeneous shelf, various islands and a slope with abundant seamounts, submarine canyons and mount structures caused by fluid venting (Würtz, 2012). These features facilitate the presence of a wide diversity of habitats and species, including a large proportion of endangered/vulnerable habitats and threatened species (MAGRAMA, 2012b). Due to its geographical location, this biodiversity hotspot (> 70% of the threatened Mediterranean marine flora and fauna display important populations in the Alborán Sea) resulting from the confluence of typical Atlantic (European and north-western African) and Mediterranean species also contain several endemic species of invertebrates (Strait of Gibraltar and Alborán Sea), marine birds and a large number of species that they only occur in this part of the Mediterranean Sea (MAGRAMA, 2012a). Moreover, it represents the obligatory pathway for migrations of large pelagics (e.g. bluefin tuna), sea turtles and marine mammals; also represents an important feeding area for cetaceans and marine birds (Camiñas, 2004; IUCN, 2012; MAGRAMA, 2012c & d).

The area is located in the westernmost part of the Mediterranean Sea, between Spain, Morocco and Algeria, covering an area of *ca.* 250,000 km² (Fig. 1) The depth range spans between 0 and *ca.* 1,500 m, with an average of *ca.* 450 m (UNEP, 2010b). The circulation pattern is very complex in the Alborán Sea where surface and recent Atlantic Waters (AW) that form 2-3 anti-cyclonic gyres, and near bottom Western Mediterranean Deep Waters (WMDW) promote a high oceanographic heterogeneity and the presence of up-wellings (Würtz, 2010; MAGRAMA, 2012a).

The Alborán Sea also represents an area of high biological productivity at different levels, promoted by the presence of nearly permanent up-wellings in the north-western part of the basin (UNEP, 2010a & c). The submarine geomorphology is very complex with the presence of 2 main basins (Alborán and Algerian) and a narrow shelf, generally less than 20 km from the coast, and a slope that can be abrupt, intermediate or progressive depending on its inclination (UNEP, 2010b). This wide variety of submarine structures promotes a wide diversity of substrate types and therefore of habitats and associated biota, resulting in ecosystems that are rich in species and in ecological interactions (MAGRAMA, 2012b). A high number of habitats that are rare or threatened within the Mediterranean and Atlantic Ocean occur in this area

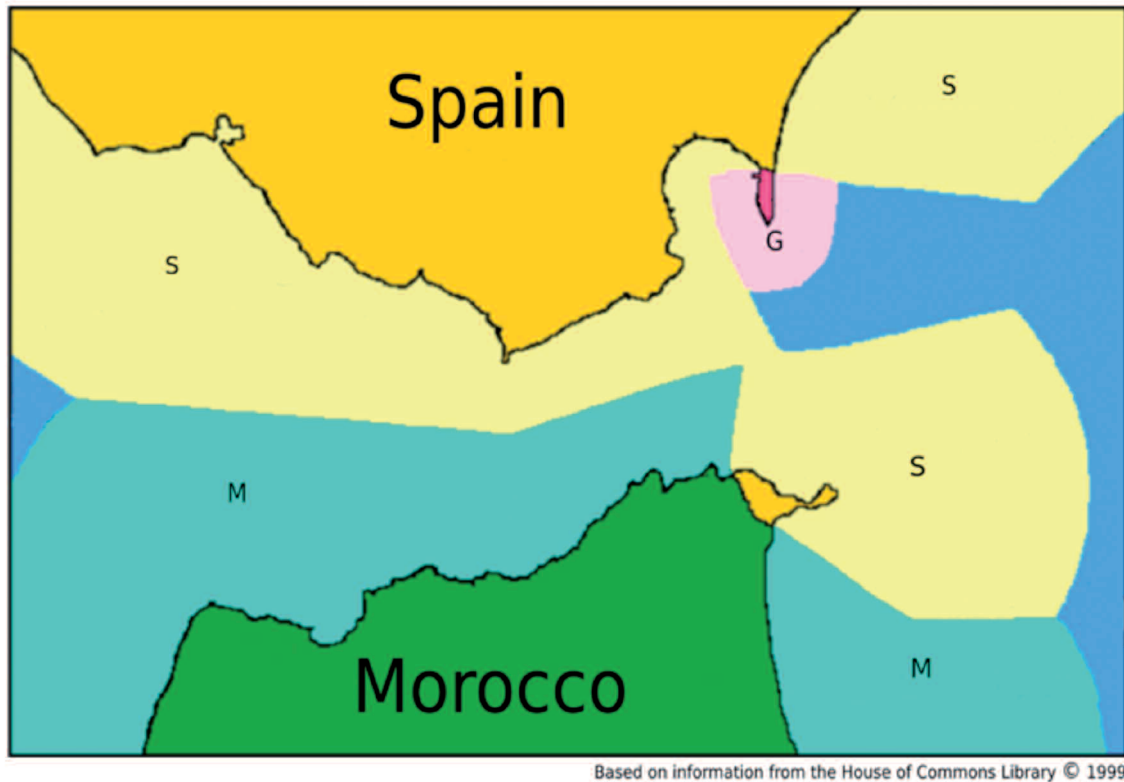


Figure 1. Maritime jurisdiction of the Alborán Sea. G: Gibraltar Territorial Seas. M: Moroccan Territorial Seas. S: Spanish Territorial Seas.

because some habitat forming species only occur in this area of the Mediterranean Sea (Barea-Azcón et al., 2008; Templado et al., 2012). Thus, the Alborán Sea is of pivotal importance to the whole Mediterranean; its connecting role with the Atlantic Ocean is of great economic and ecologic value. The Strait of Gibraltar is the second busiest sea route in the world and provides at the same time a passage for marine mammals and fish (STECF, 2006).

The main anthropogenic impacts in the area are (i) water pollution driven by the intensity of tourism in some coastal areas; (ii) fishing (e.g. bottom trawling, fishing lines) that has produced some impacts in certain habitat types and has also impacted sea turtles, cetaceans and seabirds, long-line fishing; and (iii) shipping.

Main features and challenges in the Alborán Sea

The Alborán Sea is usually divided into areas, sub-regions or sub-divisions based on either their geological, geomorphological, hydrological or biological formation or their legal-administrative structure (Suárez de Vivero, 2011). Areas defined by physical criteria, as opposed to political-administrative ones, rely on the logic of natural events and enable spaces for intervention, action and management measures to be defined and delimited. The

scales of these areas and their average size vary greatly. In some cases, such as the hydrographic basins, management institutions have been created and, in the case of the EU, the Water Framework Directive (WFD/2000/60/EC) has included the related coastal waters within these physical units. Given that they are defined along lines of strictly functional geographic criteria, these areas generally tend to be of international nature. This makes it difficult for such divisions, with boundaries based on hydrographical, geological or biological events, to become operational as they lack a legal-administrative framework. This is the difficulty that the establishment of protected marine areas comes up against when they cover waters that lie outside the national jurisdiction. In addition, some uses of the maritime space, such as navigation, are regulated by international agreements. On top of this, however, their environmental impact or the fact that they are superimposed on other uses or are competing for the same space, i.e. ports and shipping routes means that they need to be taken into consideration when planning the maritime space. Along with conventional uses, other phenomena such as unregulated migration have given rise to the establishment of control and monitoring systems for the maritime space.

Jurisdictional asymmetry

The delimitation of different jurisdictions in the Alborán Sea gives rise to what could be called a “jurisdictional asymmetry”, a consequence of the heterogeneity of the legal systems of adjacent jurisdictions: exclusive economic zone, fisheries zones, fisheries protection zones and ecological protection zones. An EEZ may thus border with another EEZ, with a FZ or a FPZ, and similarly a FZ can overlap with an EPZ. Jurisdictions similar to an EEZ involve exercising sovereign rights over specific issues that may not be the same amongst neighbouring states. Thus:

- Morocco has declared EEZs in which have sovereign rights over the marine resources, living and non-living, along with other kinds of jurisdictions (for marine environment protection and research).
- Algeria and Spain have created fisheries zones, also known as fisheries protected zones, in which they have exclusive and jurisdictional rights over fisheries.
- Algeria and Italy have created 12-mile archaeological contiguous zones adjacent to their territorial seas for the protection of submerged cultural heritage.

The establishment of maritime jurisdictions in the Mediterranean is an open and continuously changing process given that not all states have declared maritime spaces as recognised by UNCLOS and, also, because of the gradual creation of new jurisdictional concepts not envisaged in this treaty. Consequently, the current geography of maritime jurisdictions is not a static picture and, as the states take further decisions in this regard, the jurisdictional panorama will change. In addition, this jurisdictional heterogeneity creates a complex territorial reality: while a considerable part of the waters lies outside of state jurisdiction (high seas), all seabeds and its subsoil falls under the sovereignty of the different coastal states. Within a relatively small basin, freely accessible areas are therefore superimposed on others that fall under national sovereignty or jurisdiction.

Fisheries activity and territorial disputes

While jurisdiction over the continental shelf has a limited effect on fisheries – it only affects sedentary species that are in contact with the seabed – a jurisdictional declaration beyond the territorial sea significantly affects a broad spectrum of fishing methods. The declaration of fisheries protection zones has legal implications for jurisdiction over fisheries resources. The creation of such fisheries zones reduces the high seas fisheries and can also result in the need to sign agreements regarding access to these waters on the part of fleets that previously had no jurisdictional limitations. Seen from another perspective, when coastal states declare their jurisdictional rights by means of any of the above concepts, this implies a greater responsibility on

their part for resource and environmental conservation. Hence, it has been suggested to extend all states’ jurisdictional rights beyond their territorial sea, as a management and conservation mechanism that would ensure effective governance of the Mediterranean basin. Meanwhile, in the high seas, each State must apply international laws to its nationals which, with regard to fisheries, means that the state is required to supervise and check the vessels under its flag are complying with the regulations established in the different treaties.

Elements for a future EBSAs process in the Alborán Sea

Stakeholder participation

In order to achieve broad acceptance and support for the implementation of an EBSA area, it is important to involve all stakeholders at the earliest possible stage in the process. For the acceptance of and input for an EBSA in Alborán, stakeholder involvement is the key issue (Dunstan et al., 2016). It is important to convince all stakeholders in an early stage of the need for the sustainable development of the sea and the role of an EBSA can play in this respect. This enables them to provide input to policy makers. Moreover, support may be created for the results and process of the EBSA. Maritime-related policies are currently being developed in Morocco and Algeria according to a sectorial approach. This leads to considerable coordination and cooperation challenges for the public authorities involved. The implementation of new laws that enable integrated decision-making and the use of a coordination body can prove to be useful to overcome these challenges. The role of such a body can be fulfilled by an existing authority occupied with spatial planning or through the establishment of a separate entity. In Spain, coordination and cooperation is challenging because of the different levels of authority responsible for decision-making. Efficient vertical and horizontal coordination between regional and national authorities is required in order to enable holistic and integrated MSP. In this respect, it is recommended to establish a coordinating body or an inter-ministerial committee both at the national and regional level. The governmental and non-governmental stakeholders listed in table 1 are included based on their competences in the field of maritime policy and environmental protection. Moreover, research centres and other stakeholders providing information for the implementation of maritime policy are included. Stakeholders representing economic activities such as fisheries, maritime transport, ports and offshore wind are not included in this table, although they are important stakeholders.

Table 1. Relevant stakeholders in the Alborán Sea basin.

| | | | |
|-----------------------------|--|--|---|
| National Public Authorities | <ul style="list-style-type: none"> ● MAGRAMA ● Ministry of Science and Innovation ● Ministry of Public Works and Transport ● Ministry of Industry Tourism and Commerce | <ul style="list-style-type: none"> ● Ministère de l’Habitat, de l’Urbanisme et de l’Aménagements de l’Espace ● Secrétariat d’Etat charge de l’eau et l’Environnement ● Ministère de l’agriculture et de la Pêche Maritime | <ul style="list-style-type: none"> ● Ministry of Spatial Planning, the Environment and Tourism ● Ministry of Fisheries and Fishery resources ● Ministry of transport ● Ministry of energy |
| Regional/Local Authorities | <ul style="list-style-type: none"> ● Other Ministries such as Defence, Interior, Economy, Finance, Culture, Employment and Immigration, Foreign Affairs and Cooperation ● Ministries in Andalucía: Environment and agricultural and fisheries ● Other regional ministries, provinces and municipalities | | <ul style="list-style-type: none"> ● Ministry of public works ● Directorate of Environment in Wilays (regions) |
| Other stakeholders | <ul style="list-style-type: none"> ● Spanish Institute of Oceanography (OIE) ● University of Seville ● CMIMA ● IMEDIA ● IUCN | <ul style="list-style-type: none"> ● Commissariat au Eaux et forêts et à la lutte contre la désertification ● Agence de l’oriental ● Institute national de la Recherche Halieutique ● IUCN | <ul style="list-style-type: none"> ● Observatory of the Environment and Sustainable Development ● National centre for development of biological resources ● IUCN |

Cross-border cooperation

Algeria, Spain and Morocco have started to cooperate, in collaboration with IUCN, to protect the Alborán Sea. In particular, the “*Oujda Declaration on the Conservation and Sustainable Development of the Alborán Sea*” shows that a first step has been taken into coordinating the activities in the Alborán Sea. The declaration and the communication between the parties increase the level of sea coordination and help to develop common standards. In general, cooperation between Spain and Morocco is more frequent than cooperation with Algeria, but cooperation on the political level is still a difficult issue. Besides challenges in political cooperation between Morocco and Spain, cooperation between Spain and the United Kingdom (Gibraltar) is also difficult, given their disagreement about Gibraltar. Political tensions, including the relationship between Spain and UK (Gibraltar), are a challenge to the feasibility of cross-border/international cooperation. Especially in the Strait of Gibraltar, the establishment of an EBSA area will involve multiple levels of governance, requiring coordination and cooperation among countries.

Environmental and economic benefits

The effective implementation of EBSA in the Alborán Sea

will lead to enhance coordination with benefits for governments and private organisations. Moreover, it can contribute to the reduction of conflicts of interest. Quantification of the effects in the countries surrounding the Alborán Sea is not possible due to a lack of detailed area-specific data (e.g. the costs of procedures or the costs of conflicts of interest). Thus, the benefits of EBSA will be discussed in a qualitative way. If the key principles of a good governance model would be effectively implemented, enhanced coordination mechanisms would be introduced, leading to e.g. less administrative costs for local, regional and national authorities. Changes in the legal and institutional framework will first require investments in these countries, but the benefits are likely to be significant. The costs of changes will differ among countries depending on the institutional and legal framework. The process of developing an activity at sea may take considerable time in terms of licensing and permitting procedures. If the government improves this process through better coordination, overlapping procedures or other inefficiencies may disappear, leading to lower administrative costs. In addition, as a result of a more efficient government, investments by companies may be accelerated.

One of the objectives of EBSAs is to increase the scientific knowledge of the sea. This knowledge will, for

example, provide the basis for the designation of specific maritime activities (e.g. off-shore aquaculture, sand extraction) to certain zones, lowering the search costs for companies. Examples of (potential) competing activities in the Alborán Sea are competition between coastal and marine tourism and aquaculture activities and competition between fisheries and off-shore wind farms. An EBSA approach will apply the overarching principle of the ecosystem approach (UN, 2007), expressing the need for sustainable development of maritime activities (EASAC, 2016). The sustainability of certain activities in the Alborán Sea and the Strait of Gibraltar could be improved. For example, sustainable fishing can eventually lead to healthy fish stocks, leading to long-term viability of the fishing sector (FAO, 2014). Also coastal and marine tourism will benefit from clean water and healthy flora and fauna (UNESCO, 2010). An EBSA can contribute to these benefits by, for example, providing the tools to select and establish MPAs, and specifically it may be useful by mitigating the effects of maritime traffic on the marine environment in the study area (Abdulla & Linden, 2008).

Several studies have recently applied the EBSA protocol to protect certain coastal and offshore areas (Kenchington et al., 2011; Clark et al., 2014; Yamakita et al., 2015). The indicators used for applying the EBSA criteria to identify ecologically and biologically significant areas have differed among them, for example, Taranto et al. (2012) used 10 indicators to characterize the relevance of individual offshore seamounts. Also, local information provided by people has been shown to be of utmost importance for coastal management using EBSA concept (Bundy & Davis, 2013). Yamakita et al. (2015) evaluated the four major marine ecosystems in Japanese jurisdictional waters,

namely seagrass beds, seaweed beds, coral reefs, offshore pelagic waters and deep sea vents and seeps. EBSAs criteria were based on quantitative scientific information, though results showed variations depending on the statistical procedures but a high potential of this method was shown to select marine areas to meet the Aichi Conservation Target. In short, the abovementioned papers have successfully detected areas with high potential to be preserved by environmental regulations and EBSAs criteria have been shown to be a feasible tool for this purpose.

European cooperation

In the EU context, there are also a number of cooperation initiatives between Member States and the coastal states of the Alborán Sea, some of them directly related to marine environment governance (Table 2). The main initiative is the Euro-Mediterranean Partnership (Barcelona Process), which was formalised in 1995 at the Barcelona Conference. The 27 participating countries (the 15 EU Member States plus 12 non-EU Mediterranean states, among them Algeria, and Morocco) approved a Declaration and a work programme. The Partnership thus establishes a multilateral framework that closely links economic and security aspects but also includes a social, human and cultural dimension. Recently, the Directive on MSP (2014/89/EU) established a framework for maritime spatial planning for Member state nations. Member States need to identify competent authorities and to develop transboundary maritime spatial management plans within 2021.

Former published works concerning EBSAs (e.g. Kenchington et al., 2011; Clark et al., 2014; Yamakita et al., 2015) are limited to areas belonging to a single country, and

Table 2. EU Cooperation policies.

| | | |
|-------------------------------------|---|---|
| European Marine Management Policies | Management policies relating to the European marine coastal space | <ul style="list-style-type: none"> ● Common environmental policy ● Common spatial development policy ● Common European coastal strategy ● EU integrated maritime policy ● European strategy to protect and conserve the marine environment ● European Marine Strategy Directive |
| European Marine Management Policies | Euro-Mediterranean management policies | <ul style="list-style-type: none"> ● MEDSPA Programme ● Scientific projects ● Support of the Environmental Programme for the Mediterranean¹ ● Participation in the MAP and Barcelona Convention ● Proposed European environmental strategy for the Mediterranean |

¹ Nicosia Charter (1990). Cairo Declaration (1992). Regulation No 16/94 on Mediterranean fishery resource conservation (1994). Heraklion Declaration (1994).

to our knowledge, no former approaches have been conducted in regions beyond national jurisdictional waters and nation state borders, as it occurs in the Alborán Sea where three countries (Spain, Morocco and Algeria) are involved. Thus, transboundary spatial planning is pivotal in the process of EBSA creation in the Alborán Sea.

Thus, information provided by several examples of transboundary marine spatial planning so far developed are of utmost importance for the EBSA creation in the Alborán Sea. These studies have been carried out mostly in European jurisdictional waters. For example, in the North Sea has been developed the project MASPNOSE to facilitate cross-border cooperation between European countries, based on an ecosystem-based MSP (Pastoors et al., 2012). This project is focused on two offshore Banks that are within the Exclusive Economic Zones of five European countries (United of Kingdom, the Netherlands, Belgium, Germany and Denmark) (Hommes, 2012). The main results of this project were the development of management proposals regarding fisheries management, offshore wind parks and shipping traffic, and to compare national plans among involved countries. Another example of transboundary marine spatial planning was TPEA, focusing on areas in Portugal-Spain and Ireland-United of Kingdom, and key lessons to adopt a transboundary approach to MSP were adopted (Jay et al., 2016). Also, this project adopted five principles to guide engagement, namely inclusivity, equity, flexibility, transparency and integration (Jay et al., 2016). Lastly, the context dependent approach is shown to be pivotal to understand differences in governance systems. Other examples have been developed in other European regions such as, the Baltic Sea (Backer, 2011; Backer et al., 2013).

Data collection, knowledge creation and evaluation

Marine research institutes are present in the three countries (Spain, Morocco and Algeria). This provides a good basis for the data and knowledge aspect of the EBSA. The knowledge base in Spain is strong. However, according to the Spanish Institute of Oceanography (IEO), research in the Alborán Sea has been lagging behind compared to other parts of Spain. Therefore, more studies in the Alborán Sea need to be initiated. According to Moroccan stakeholders, the Moroccan research infrastructure is good, but an overall vision is required for the approach towards future research topics. In general, the collection of data and knowledge for areas further offshore needs to be improved. In addition, the data and research methods of the different research institutes need to be aligned in order to make data comparable, also internationally. The development of more uniform research methodologies is required in order to make data comparable and coordination on the selection of research topics is important in order to avoid overlapping

work. The creation of a network involving all marine research parties for the Alborán Sea may provide the framework for coordination and cooperation. This initiative may be formed under the EBSA umbrella of the collaboration between the three countries (Spain, Morocco and Algeria) for the Alborán Sea protection. An assessment should be made of the most important research topics for the territorial seas and high seas.

Coherence between terrestrial planning and maritime spatial planning

The relation between terrestrial planning and maritime planning is strong in the Alborán Sea, given the impact of land-based activities on the maritime activities taking place and the pressures on the marine environment. Despite this strong link, the lack of adoption of ICZM (Integrated Coastal Zone Management) and MSP (Maritime Spatial Planning) strategies in the Alborán Sea increases the likelihood of planning issues given the increasing activities taking place in coastal areas. In general, spatial coastal planning is often perceived as being more challenging than maritime spatial planning, because of the concentration of activities on a relatively small area. Consequently, the development of an ICZM strategy often has a higher priority than the development of MSP (PRC, 2011). The development of an EBSA area is preferably developed simultaneously with MSP and ICZM to achieve coherence.

Monitoring and control

Cross-sectorial national cooperation should be considered to integrate monitoring and control activities (Table 3). For areas bordered by multiple states, cross-border and international cooperation can be applied for physical surveillance. The coast guards may cooperate near borders for control purpose, since the Strait of Gibraltar is an international strait, the adjacent countries have to provide 'transit passage' to merchant ships. The establishment of an independent monitoring and control body may provide a basis for surveillance on the high seas and in the Strait of Gibraltar. For management and control of the high seas, countries have the option to cooperate internationally through conventions/treaties or even establishing maritime zones. The establishment of an EBSA could be a good solution. If cooperation does not lead to the desired effects, an alternative is the establishment of maritime zones in the Mediterranean Sea, in particular Exclusive Economic Zones. In the Mediterranean Sea, the establishment of zones is challenging due to the relative proximity of other countries; the zones' borders may be disputed by the adjacent countries. In the Alborán Sea the establishment of zones is a difficult issue, because of disagreement about the maritime border between Spain and UK, and Spain and

Table 3. International organisations marine conservation areas and criteria.

| Type of areas | Legal basis | Criteria |
|--|---|--|
| ● Ecologically or Biologically Significant Areas (EBSAs) | ● CBD COP 9, Decision IX/20 on Marine and Coastal Biodiversity, 2008, Annex I | <ol style="list-style-type: none"> 1. Uniqueness or rarity 2. Special importance for life-history stages of species 3. Importance for threatened, endangered or declining species and/ or habitats 4. Vulnerability, fragility, sensitivity, or slow recovery 5. Biological productivity 6. Biological diversity 7. Naturalness |
| ● Vulnerable Marine Ecosystems (VMEs) | <ul style="list-style-type: none"> ● United Nations General Assembly, Resolution 61/105, 2006, §83; ● FAO International Guidelines for the management of deep-sea fisheries in the high seas, 2008 | <ol style="list-style-type: none"> 1. Uniqueness, rarity 2. Functional importance of habitat 3. Fragility 4. Life history attributes of species 5. Structural complexity |
| ● Particularly Sensitive Sea Areas (PSSAs) | <ul style="list-style-type: none"> ● Resolution IMO A.982 (24), 2006; ● Marine Environment Protection Committee (MEPC) Circular MEPC.1/Circ. 510, 2006 | <p>3 cumulative conditions:</p> <ol style="list-style-type: none"> 1. The area must meet at least one of the following criteria: uniqueness or rarity; critical habitat; dependency; representativeness; diversity; productivity; spawning or breeding grounds; naturalness; integrity; fragility; bio-geographic importance; social or economic dependency; human dependency; cultural heritage; research; baseline for monitoring studies; education. 2. The area must be vulnerable to damage by international shipping activities. 3. There must be measures that can be adopted by IMO to provide protection to the area from these specifically identified international shipping activities. |
| ● Special Areas of Mediterranean Interest (SPAMIs) | ● Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean, 1995, Annex I (b) | <ol style="list-style-type: none"> 1. Uniqueness 2. Natural representativeness 3. Diversity 4. Naturalness 5. Presence of habitats that are critical to endangered, threatened or endemic species 6. Cultural representativeness |
| ● OSPAR MPAs | <ul style="list-style-type: none"> ● Article 3 (1) (b) (ii) of Annex V of the OSPAR Convention on the protection and conservation of the ecosystems and biological diversity of the maritime area, 1998 ● Guidelines for the Identification and Selection of Marine Protected Areas in the OSPAR Maritime Area, 2003. | <p>Ecological criteria/considerations:</p> <ol style="list-style-type: none"> 1. Threatened or declining species and habitats/biotopes; 2. Important species and habitats/biotopes; 3. Ecological significance; 4. High natural biological diversity; 5. Representativity; 6. Sensitivity; 7. Naturalness; 8. Practical criteria/considerations <p>Size</p> <ol style="list-style-type: none"> 1. Potential for restoration 2. Degree of acceptance 3. Potential for success of management measures 4. Potential damage to the area by human activities 5. Scientific value |

Morocco. In this respect, some form of agreement about maritime borders is an important step to divert attention to the application of international cooperation on sea and should therefore be a priority in this area.

Conclusions

The need for EBSAs is considered an important step forward for the conservation of the Alborán Sea, in particular for its intense use and for the potential growing conflicts among user's needs and ecosystem protection policies. EBSAs are a key element to achieve the kind of decision-making that balances sectorial interests competing for maritime spaces, in particular in relation to the increased economic use of the marine and coastal space. The development of EBSAs will be highly influenced by the need of a holistic and ecosystem-based approach that allows the contemporary management of an increasing demand for sea space and of an ecologically responsible decision-making (UNEP, 2011). For the implementation of this process it is important to progressively reach a more efficient vertical and horizontal coordination between national and regional authorities and among countries. Indeed, the interconnection of sea spaces, the cross-boundary impact of sea uses and land-based sources, the needed agreement on sustainable management of maritime resources and more generally the broader scale needed to be ecologically meaningful, require the development of an international and cooperative perspective in the implementation of EBSAs in this basin. EBSAs could represent comprehensive and accessible source of data and information, and therefore a key instrument. EBSAs could help public authorities and stakeholders to coordinate their action and optimize the use of marine space to benefit economic development and the marine environment (CBD, 2012).

The Alborán Sea is a good example about the need of the definition of a common vision for the future of our Seas as an essential step of the implementation of the EBSAs process, which makes clear why forward-looking thinking and long-term perspective is essential. EBSAs can provide a holistic cross-sectorial view on issues that are often regarded separately, facilitate the stakeholder dialogue and help and achieve trans-nationality and cooperation. With the EBSAs in the process, this ambitious information-gathering exercise demonstrates how scientific expertise can catalyse management decisions. CBD (Convention of Biological Diversity) through EBSAs can play an active role in providing strong and high-quality data and knowledge base and technical advice to States and competent authorities but is removed from direct management action. Without formal cooperation or information-sharing mechanisms in place, however, it is

unclear how institutions will make use of this scientific advice to enact management measures. An important effort should be put in processing data in forms really useful for the decision-making process, including among the other thematic maps of current and future uses and maps of main conflicts. Stakeholder participation is required in all stages of the EBSAs process, can provide sources of knowledge and help in shaping data, it is also essential in achieving broad acceptance of the marine protection and support to its implementation. It is of pivotal importance that stakeholder participation is organized ensuring a fair balance among various stakeholder typologies and geographic areas. It is also important that the process stimulate the participation of the citizens in general, regardless of their partnership to any associations. The concept of transparency is strictly connected to participation: the mechanism that brings to decision should be easily understood by all participants to the process and any data and document should be freely accessible.

Cross-border cooperation in EBSAs is essential at all levels: methodological, strategic and implementation. Such cooperation shall in particular take into account issues of a transnational nature, such as cross-border infrastructures. Cross-border cooperation is particularly needed on the following related issues: (i) Data gathering and exchange, (ii) Nature conservation, (iii) Climate change adaptation, (iv) Marine research and innovation, (v) Fishing and conservation of fish stocks, (vi) Environment, (vii) Spatial planning, Regional development, and (viii) Maritime transport. Long-term objectives are essential in dealing with the strategic and anticipatory nature of EBSAs and allow to plan and implement actions in a period long enough to get concrete results. The long-term perspective is also essential in dealing with the challenges set by climate change adaptation of the marine and maritime sectors. To be effective the model of governance of EBSAs should be legally binding; this can reinforce commitment of all the actors in ensuring their participation in the long-term, however, this opens the ground to a relevant and a wide discussion on international legal and governance issues.

In conclusion, while our understanding of the utility of describing EBSAs is clear (UNEP, 2014) there still remain questions about the role that EBSAs play within a broader management framework. A number of States, regional, and international organizations have experienced criteria similar to that used in the EBSA process and have also used these to prioritize planning and management and monitoring (Tables 3 & 4). In this regard, the development of the inclusive EBSA criteria, which incorporate many aspects of previous criteria systems, both within and beyond national jurisdiction, has allowed for an approach compatible with other biodiversity criteria suites. Therefore, the EBSA criteria represent a common currency

Table 4. International criteria and EBSAs correspondence. Correspondence between the CBD EBSA criteria and other international criteria used by IGOs and NGOs are indicated by either a check ✓ where it exists, an X where it doesn't, and a ? where there is uncertainty or the criteria suites under review. **CBD:** Convention on Biological Diversity. **EBSA:** Ecologically or Biologically Significant Marine Areas. **FAO:** Food and Agriculture Organization of the United Nations. **IBA:** Important Bird and Biodiversity Areas. **IMO:** International Maritime Organization. **IUCN:** International Union for Conservation of Nature. **KBA:** Key Biodiversity Areas. **RAMSAR:** Ramsar convention: <https://www.ramsar.org/about-the-ramsar-convention>. **UNESCO:** United Nations Educational, Scientific and Cultural Organization. **VME:** Vulnerable Marine Ecosystem. **PSSA:** Particular Sensitive Sea Area. **WHS:** Work Health and Safety.

| Organization | CBD | FAO | IMO | UNESCO | RAMSAR | Bird Life | IUCN |
|---|------|-----|------|--------|--------|-----------|------|
| Site criteria | EBSA | VME | PSSA | WHS | RAMSAR | IBA | KBA |
| 1. Uniqueness or rarity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2. Special importance for life history stages of species | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 3. Importance to threatened or endangered species | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 4. Vulnerability, fragility, sensitivity or slow recovery | ✓ | ✓ | ✓ | X | ? | X | ? |
| 5. Productivity | ✓ | X | ✓ | ✓ | X | X | ? |
| 6. Biodiversity | ✓ | X | ✓ | ✓ | ✓ | X | ? |
| 7. Naturalness | ✓ | X | ✓ | ✓ | ✓ | X | ? |
| 8. Structure | X | ✓ | ✓ | X | X | X | ? |
| 9. Historical geomorphological importance | X | X | X | ✓ | X | X | X |

across marine/maritime sectors that have stimulated a new multi-party dialog amongst the CBD and international conservation agreements, sectorial management bodies, and States. The EBSA Repository will have to be made fully functional, providing access to EBSA descriptions and their supporting data.

Acknowledgements

A sincere gratitude to Fernando González Bernáldez Foundation for the scholarship to attend the Master in "Protected Areas Management" during which the first author (D.T.) developed her MS Thesis on "Advancing governance of the open seas: defining a future for EBSAS in the Mediterranean Sea". A special thanks to the IUCN Mediterranean Cooperation Office colleagues: Andrés Alcántara, Alain Jeudy, Lourdes Lázaro Marín and Antonio Troya for their support during the first author (D.T) stay in Málaga to develop her research activity and to MedPan colleague, Puri Canals.

References

- Abdulla A. & Linden O. (eds) 2008.** *Maritime traffic effects on biodiversity in the Mediterranean Sea: Review of impacts, priority areas and mitigation measures.* IUCN Centre for Mediterranean Cooperation: Malaga. 184 pp.
Doi: https://cmsdata.iucn.org/downloads/maritime_v1_lr.pdf
- Backer H. 2011.** Transboundary maritime spatial planning: a Baltic Sea perspective. *Journal of Coastal Conservation*, **15**: 279-289. Doi: 10.1007/s11852-011-0156-1
- Backer H., Bergstrom U., Fredricsson C., Fredriksson R.,**

Frias M., Hamalainen J. & Snowball L.Z. 2013. *Planning the Bothnian Sea.* Report n° 158, 160 pp.

Barea-Azcón J.M., Ballesteros-Duperón E. & Moreno D. 2008. *Libro Rojo de los Invertebrados de Andalucía.* Consejería de Medio Ambiente, Junta de Andalucía: Sevilla. 1446 pp.

Bundy A. & Davis A. 2013. Knowing in context: an exploration of the interface of marine harvesters' local ecological knowledge with ecosystem approaches to management. *Marine Policy*, **38**: 277-286. Doi: 10.1016/j.marpol.2012.06.003

Camiñas J.A. 2004. *Sea turtles of the Mediterranean Sea: population dynamics, sources of mortality and relative importance of fisheries impacts.* Expert consultation on interactions between sea turtles and fisheries within an ecosystem context. Food and Agriculture Organization Fisheries: Rome. 58 pp.
<http://www.arlis.org/docs/vol1/58966248/58966248p27-84.pdf>

Clark M.R., Rowden A., Schlacher T.A., Guinotte J., Dunstan P.K., Williams A. et al. 2014. Identifying ecologically or biologically significant Areas (EBSA): asystematic method and its application to seamounts in the SouthPacific Ocean. *Ocean and Coastal Management*, **91**: 65-79.
Doi: 10.1016/j.ocecoaman.2014.01.016

Convention of Biological Diversity (CBD) 2006. CBD COP 8, Decision VIII/24 on protected areas, Annex II. <https://www.cbd.int/doc/decisions/cop-08/cop-08-dec-24-en.pdf>.

Convention of Biological Diversity (CBD) 2008. CBD COP 9, Decision IX/20 on marine and coastal biodiversity, Annex I. <https://www.cbd.int/doc/decisions/cop-09/cop-09-dec-20-en.pdf>.

Convention of Biological Diversity (CBD) 2012. Identifying specific elements for integrating the traditional, scientific, technical and technological knowledge of indigenous and local communities, and social and cultural criteria and other aspects for the application of scientific criteria for identification of ecologically or biologically significant areas (EBSAS) as well

- as the establishment and management of marine protected areas, UNEP/CBD/SBSTTA/16/INF/10. <https://www.cbd.int/doc/meetings/sbstta/sbstta-16/information/sbstta-16-inf-10-en.pdf>
- Douve F. & Ehler C.N. 2009.** New perspectives on sea use management: Initial findings from European experience with marine spatial planning. *Journal of Environmental Management*, **90**: 77-88. Doi: 10.1016/j.jenvman.2008.07.004
- Dunstan P.K., Bax N.J., Dambacher J.M., Haynes K.R., Hedge P.T., Smith D.C. & Smith A.D.M. 2016.** Using ecologically or biologically significant marine areas (EBSAs) to implement marine spatial planning. *Ocean & Coastal Management*, **21**: 116-127. Doi: 10.1016/j.ocecoaman.2015.11.021
- European Academies Science Advisory Council (EASAC) 2016.** Marine sustainability in an age of changing oceans and seas. 60 pp. http://www.easac.eu/fileadmin/PDF_s/reports_statements/MarSus_Web_file_final.pdf
- Food and Agriculture Organization of the United Nations (FAO) 2014.** The state of world fisheries and aquaculture. Opportunities and challenges. <http://www.fao.org/3/a-i3720e.pdf>
- Hombres S. 2012.** Report on cross-border maritime spatial planning in two case studies (Report MASPNOSE Deliverable D1.2).
- International Union of Conservation of Nature (IUCN) 2012.** *Propuesta de una red representativa de áreas marinas protegidas en el mar de Alborán / Vers un réseau représentatif d'aires marines protégées dans la mer d'Alboran*. IUCN: Gland, Suiza y Málaga, España. 124 pp. https://cmsdata.iucn.org/downloads/medras_alboran_esp_fra_1.pdf
- Jay S., Alves F.L., O'Mahony C., Gomez M., Rooney A., Almodovar M. & Campos A. 2016.** Transboundary dimensions of marine spatial planning: Fostering inter-jurisdictional relations and governance. *Marine Policy*, **65**: 85-96. Doi: 10.1016/j.marpol.2015.12.025
- Kenchington E., Link H., Roy V., Archambault P., Siferd T., Treble M. et al. 2011.** Identification of mega and macrobenthic ecologically and biologically significant areas (EBSAs) in the Hudson Bay complex, the western and eastern Canadian Arctic. DFOC Canadian Science Advisory Secretariat. Research Document (2011/071). 58 pp. http://publications.gc.ca/collections/collection_2013/mpo-dfo/Fs70-5-2011-071-eng.pdf
- Ministerio de Agricultura, Alimentación y Medio Ambiente (MAGRAMA) 2012a.** Estrategia Marina Demarcación Marina del Estrecho y Alborán. Parte 1: Marco general evaluación inicial y buen estado ambiental. Ministerio de Agricultura, Alimentación y Medio Ambiente, Secretaría General Técnica, Centro de Publicaciones. http://www.magrama.gob.es/es/costas/temas/proteccion-medio-marino/I_Marco_General_Estrecho_y_Alboran_tcm7-204334.pdf
- Ministerio de Agricultura, Alimentación y Medio Ambiente (MAGRAMA) 2012b.** Estrategia Marina Demarcación Marina Estrecho y Alborán. Parte 4: Descriptores del buen estado ambiental. Descriptor 6: Fondos Marinos. Evaluación inicial y buen estado ambiental. Ministerio de Agricultura, Alimentación y Medio Ambiente, Secretaría General Técnica, Centro de Publicaciones. http://www.magrama.gob.es/es/costas/temas/proteccion-medio-marino/IV_D11_Estrecho_y_Alboran_tcm7-207249.pdf
- Ministerio de Agricultura, Alimentación y Medio Ambiente (MAGRAMA) 2012c.** *Estrategias Marinas. Grupo Aves Marinas. Evaluación inicial y buen estado ambiental*. Ministerio de Agricultura, Alimentación y Medio Ambiente. http://www.magrama.gob.es/es/costas/temas/proteccion-medio-marino/0_Documento_grupo_aves_tcm7-223807.pdf
- Ministerio de Agricultura, Alimentación y Medio Ambiente (MAGRAMA) 2012d.** *Estrategias Marinas. Grupo Mamíferos marinos. Evaluación inicial y buen estado ambiental*. Ministerio de Agricultura, Alimentación y Medio Ambiente. http://www.magrama.gob.es/es/costas/temas/proteccion-medio-marino/0_Documento_grupo_mamiferos_marinos_def_tcm7-229902.pdf
- Pastors M., Hommes S., Maes F., Goldsborough D., Vos B. et al. 2012.** Preparatory action on maritime spatial planning in the North Sea. MASPNOSE, Final Report, May 2012.
- Policy Research Corporation (PRC) 2011.** *The potential of maritime spatial planning in the Mediterranean Sea. Case study report: The Alborán Sea*. Directorate-General for Maritime Affairs and Fisheries. 56 pp. http://ec.europa.eu/maritimeaffairs/documentation/studies/documents/case_study_alboran_sea_en.pdf
- Scientific, Technical and Economic Committee for Fisheries Opinion (STECF) 2006.** Sensitive and essential habitats in the Mediterranean Sea. Commission of the European Communities. https://stecf.jrc.ec.europa.eu/documents/43805/122924/06-04_SG-MED+06-01+-+Sensitive+habitats_SEC_xxx.pdf
- Suárez de Vivero J.L. (ed.) 2011.** Atlas de la Europa Marítima. Jurisdicciones, usos y gestión. <http://www.marineplan.es/es/index.html>
- Taranto G.H., Kvile K.Ø., Pitcher T.J. & Morato T. 2012.** An ecosystem evaluation framework for global seamount conservation and management. *PLoS One*, **7**: e42950. Doi: 10.1371/journal.pone.0042950
- Templado J., Ballesteros E., Galparsoro I., Borja A., Serrano A., Martín-García L. & Brito 2012.** *Guía Interpretativa. Inventario Español de Hábitats y Especies Marinos*. Ministerio de Agricultura, Alimentación y Medio Ambiente: Madrid. 232 pp.
- United Nations (UN) 2007.** Ecosystem approaches and oceans, United Nations Open-ended Informal Consultative Process on oceans and the law of the Sea. <https://www.cbd.int/doc/meetings/mar/cbwsoi-wafr-01/other/cbwsoi-wafr-01-ca-and-oceans-en.pdf>
- United Nations Educational, Scientific and Cultural Organization (UNESCO) 2010.** *Healthy ocean, healthy people, knowing our ocean. Protecting our marine treasures, empowering ocean citizens*. Unesco. 23 pp. <http://unesdoc.unesco.org/images/0021/002166/216651e.pdf>
- United Nations Environment Programme (UNEP) 2008.** UNEP/CBD/SBSTTA/13/INF/14. <https://www.cbd.int/doc/meetings/sbstta/sbstta-13/information/sbstta-13-inf-14-en.pdf>
- United Nations Environment Programme (UNEP) 2010a.** UNEP-

- MAP-RAC/SPA. 2010a. *Overview of scientific findings and criteria relevant to identifying SPAMIs in the Mediterranean open seas, including the deep sea*. (G. Notarbartolo di Sciarra & T. Agardy eds). RAC/SPA: Tunisia. 100 pp. http://www.rac-spa.org/sites/default/files/meetings/nfp_r_ext_1/wg.348_inf03.pdf
- United Nations Environment Programme (UNEP) 2010b.** UNEP-MAP-RAC/SPA. Technical report on the geographical information system developed for Mediterranean open seas. (S. Requena S. ed). RAC/SPA: Tunisia. 50 pp. <https://www.cbd.int/doc/meetings/mar/ebsaws-2014-03/other/ebsaws-2014-03-submission-rac-spa-5-en.pdf>
- United Nations Environment Programme (UNEP) 2010c.** UNEP-MAP- RAC/SPA 2010b. *The Mediterranean Sea Biodiversity: state of the ecosystems, pressures, impacts and future priorities* (H. Bazairi, S. Ben Haj, F. Boero, D. Cebrian, S. De Juan, A. Limam, J. Lleonart, F. Torchia & C. Rais eds) RAC/SPA: Tunisia. 102 pp. http://www.rac-spa.org/sites/default/files/doc_cop/biodiversity.pdf
- United Nations Environment Programme (UNEP) 2011.** *Taking steps toward marine and coastal ecosystem-based management - An introductory guide*. UNEP Regional Seas Reports and Studies, **189**. 68 pp. http://www.unep.org/pdf/EBM_Manual_r15_Final.pdf
- United Nations Environment Programme (UNEP) 2014.** *Ecologically or biologically significant marine areas (EBSAs). Special phase in the world's oceans, vol. 1: Western South Pacific Region*. Secretariat of the Convention on Biological Diversity: Montréal. 104 pp. <https://www.cbd.int/marine/ebsa/booklet-01-wsp-en.pdf>
- van Tatenhove J.P.M. 2017.** Transboundary marine spatial planning: a reflexive marine governance experiment? *Journal of Environmental Policy & Planning*, **19**: 783-794. Doi: 10.1080/1523908X.2017.1292120
- Würtz M. 2010.** *Mediterranean pelagic habitat: oceanographic and biological processes, an overview*. IUCN: Gland, Switzerland and Malaga, Spain. 90 pp. http://rac-spa.org/sites/default/files/doc_fsd/med_pelagic_habitats.pdf
- Würtz M. ed. 2012.** *Mediterranean submarine canyons: ecology and governance*. IUCN: Gland, Switzerland and Málaga, Spain IUCN. 212 pp. https://cmsdata.iucn.org/downloads/2012_035.pdf
- Yamamita, T., Yamamoto, H., Nakaoka, M., Yamano, H., Fujikora, K., Hidaka, K., Hirota, Y., Ichikawa T., Kakehi S. et al. 2015.** Identification of important areas around the Japanese Archipelago: Establishment of a protocol for evaluating a broad area using ecologically and biologically significant areas selection criteria. *Marine Policy*, **51**: 136-147. Doi: 10.1016/j.marpol.2014.07.009