“The potential of Maritime Spatial Planning in the Mediterranean Sea”

Case study report: The Alboran Sea

For the attention of

European Commission
Directorate-General for Maritime Affairs and Fisheries
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I. INTRODUCTION

Maritime Spatial Planning (MSP), aiming to result in a more coordinated management of maritime space, received significant attention at EU-level in recent years. The Communication ‘Roadmap for Maritime Spatial Planning: Achieving common principles in the EU’, was adopted by the Commission on November 25, 2008. This communication provides information on current Maritime Spatial Planning practices in both EU and non-EU Member States and outlines the instruments which have an impact on Maritime Spatial Planning. Besides the development of 10 key principles for Maritime Spatial Planning and a series of dedicated workshops, the Commission also initiated a number of specific studies. Against this background, the study on ‘Exploring the potential for Maritime Spatial Planning in the Mediterranean Sea’ was launched in October 2009. During this study, four areas were identified which could have more potential for the application of cross border/international Maritime Spatial Planning and were therefore subject to a more in-depth analysis:

- The Alboran Sea (Algeria, Morocco and Spain);
- The Adriatic Sea basin (Albania, Bosnia and Herzegovina, Croatia, Italy, Montenegro and Slovenia);
- The Western Mediterranean (Italy, France, Monaco and Spain);
- The area surrounding Malta (including Tunisia, Libya and Italy).

This case study goes further into detail on the potential for the application of cross border/international Maritime Spatial Planning in the Alboran Sea basin.

For the purpose of this report and in the light of the definition of MSP, the potential of Maritime Spatial Planning is analysed on the basis of three aspects:

- **Purpose of MSP in the area**: type and intensity of uses as well as the ecological value of the marine area;
- **Feasibility of MSP in the area**: scientific data/knowledge base, institutional capacity, legal and administrative supportive framework and stakeholders involvement;

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1 Maritime Spatial Planning (MSP) is a process of analysing and allocating parts of the three-dimensional marine space (ecosystems) to specific uses, to achieve ecological, economic and social objectives that are usually specified through a political process. It is a tool for improved decision-making and provides a framework for arbitrating between competing human activities and managing their impact on the marine environment. Its objective is to balance sectoral interests and achieve sustainable use of marine resources in line with the EU Sustainable Development Strategy.
Exploring the potential of maritime spatial planning in the Mediterranean

- *Conditions for cross-border/international cooperation* (in case the marine area falls beyond national jurisdiction – which is mostly the case for marine areas in the Mediterranean Sea basin).

The present case study is structured on the basis of the *MSP key principles* and provides further insight into:

- The need for MSP in the Alboran Sea basin:
  - Description of the area;
  - Maritime jurisdiction;
  - Sea-uses and environmental pressures.

- The application of MSP in the Alboran Sea basin:
  - The different sea-uses in specific areas and sub-areas in the Alboran Sea basin and the existing/expected competition between these uses (including ecology preservation);
  - National stakeholder participation;
  - The institutional arrangements (including transparency) and legal framework related to Maritime Spatial Planning;
  - Cross-border/international cooperation and consultation;
  - Data collection, monitoring and evaluation;
  - Coherence between territorial planning and Maritime Spatial Planning.

- Conclusions and recommendations.

Information on these elements per country is detailed in *Appendix I* to the final report. A list of abbreviations used in this report is provided in *Annex I*.

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2 MSP key principles 1 and 2.
3 MSP key principles 1 and 2.
4 MSP key principle 4.
5 MSP key principles 3, 5 and 6.
6 MSP key principle 7.
7 MSP key principles 8 and 10.
8 MSP key principle 9.
II. THE NEED FOR MSP IN THE ALBORAN SEA BASIN

A first impression with regard to the need/potential for MSP in the Alboran Sea basin is provided in the following sections. A general description of the area is given in Section II.1, followed by an overview of the areas under national jurisdiction, which is an important aspect with regard to the actual application of cross-border/international MSP in a certain area. Section II.3 concludes by providing insight into the different sea-uses in the sea basin along with competition between the different uses and the related environmental pressures.

II.1. DESCRIPTION OF THE AREA

The Alboran Sea is located in the Western Mediterranean and connects with the Atlantic Ocean through the Strait of Gibraltar. The Alboran Sea’s border on the western side is the eastern limit of the Strait of Gibraltar and its border on the eastern side is the line joining Cape de Gata (Spain) to Cap Fegalo (Algeria). The Alboran Sea borders the countries Spain, Morocco, Algeria and UK (Gibraltar). Figure 1 presents the Alboran Sea and its surrounding countries.

Figure 1: The Alboran Sea basin and its coastal states

The total Alboran Sea coastline consists of approximately 1230 km. It is divided into a Spanish coastline of 570 km, a Moroccan coastline of 540 km and an Algerian coastline of 120 km. The surface area of the Alboran Sea is approximately 57000 km².
The Alboran Sea is a transition zone between the Mediterranean Sea and the Atlantic Ocean resulting in different oceanographic characteristics. The Strait of Gibraltar enables water exchange resulting in a flow of incoming Atlantic surface water in the Mediterranean and an influx of Mediterranean waters in the opposite direction on the bottom of the strait. This causes a series of oceanographic phenomena of significant importance. In Figure 2 the streams are presented together with their directions. The circulation of water masses results in the creation of areas of significant ecological productivity and the distribution of Atlantic species in the Mediterranean Sea.

The Alboran Sea is a confluence of three regions: the Lusitanian (warm-cold), the Mauritanian, (warm) and the Mediterranean. In its flora and fauna species can be found of Atlantic Europe, the Mediterranean and influences of the subtropical character of Northwestern-Africa, contributing several endemic species. This leads to the greatest diversity of species in the European seas.

Figure 2: Currents in the Alboran Sea

II.2. MARITIME JURISDICTION

The minimum breadth of the Alboran Sea is +/- 10 nautical miles (nm) (in the Strait of Gibraltar) and its maximum breadth is +/- 95 nm. The territorial waters of Spain (Law 10/1977), Morocco and
The need for MSP in the Alboran Sea basin

Algeria are 12 nm. All three countries have established a contiguous zone of 24 nm\(^\text{13}\). Morocco and Spain (Law 15/1978) have established an Exclusive Economic Zone (EEZ) of 200 nm, but not in the Mediterranean. The UK (Gibraltar) established jurisdiction of 3 nm around Gibraltar, with exemption of the 2 nm border on the west side where a median line exists between Spanish and UK waters\(^\text{14}\).

In 1994, Algeria established an exclusive fishing zone (zone de pêche réservée), which extents 32 nm from the western maritime border to Ras Ténès and 52 nm from Ras Ténès to the eastern maritime border. Spain, by Royal Decree No. 1315/1997, established a 37 nm wide fisheries protection zone measured from the outer limit of the territorial sea. The fisheries protection zone is delimited according to the line which is equidistant (median line) from the opposite coast of Algeria and Italy and the adjacent coast of France. No fisheries protection zone has been established in the Alboran Sea. Spain argued, in the preamble of the Royal Decree, that extension of jurisdiction over fisheries resources beyond territorial waters was a necessary step to ensure adequate and effective protection of fish resources. In Spain’s view, maintaining the status quo, which was already characterised by excessive exploitation of fish resources, was unacceptable as it would have led to the depletion of these resources\(^\text{15}\).

II.3. SEA USES AND ENVIRONMENTAL PRESSURES

a/ Flora and fauna and Marine Protected Areas

Flora and fauna\(^\text{16}\)

The Alboran Sea contains a wide diversity in plankton of which its biomass is considered to be the highest in the Mediterranean. Furthermore, three seagrass species are present in the Mediterranean: Posidonia oceanica, Cymodocea nodosa and Zostera marina. These seagrass beds, especially the Posidonia oceanica, are of important ecological value, and can be qualified as ‘the lungs of the Mediterranean’, providing a main source of oxygen. Moreover, oxygen seagrass provides shelter and food to a wide variety of fish and an attractive habitat for fish to spawn. Posidonia oceanica is endemic along the Mediterranean and is considered as a priority species for conservation in the EU Habitats Directive. Its presence is currently declining in the Mediterranean, although in the area of Cabo de Gata it is better preserved (protected area). Reasons for the decline are among others pollution, (illegal) bottom trawling and sand extraction (for beach nourishment).

\(^{13}\) This includes the territorial waters (12 nm) and the contiguous waters (12 nm). In case a law is adopted for the establishment of a certain maritime zone, the zone is considered to be ‘established’. If a country is intending to establish a maritime zone, but does not have such legislation in place, the maritime zone is considered to be ‘claimed’.


\(^{15}\) Chevalier, C. – IUCN, Governance in the Mediterranean Sea, legal regimes and prospectives.

\(^{16}\) Most information has been obtained from IUCN, 2007, Conservation and Sustainable Development of the Alboran Sea (Conservation et Développement Durable de la Mer d’Alboran: éléments stratégiques pour sa gestion future).
With regard to fauna, many species of invertebrates are present in the Alboran Sea (e.g. the Norway lobster and red shrimp). The variety of fish species in the Alboran Sea is estimated to be around 300. The most commercial demersal species in the Alboran Sea are mullet, hake and blue whiting. The most commercial pelagic species are sardine, anchovy and horse mackerel. Tuna and mackerel are also present (seasonally). Bluefin tuna (Thunnus thynnus) conducts annual migrations between the Atlantic and the Mediterranean. Other species fairly abundant in the area are swordfish, barracuda and ocean sunfish. In the Mediterranean more than 20 species of sharks have been recorded. Among the large-sized sharks are: sharks of the sort Galeorhinus galeus, porbeagle and dogfish. Occasionally the white shark, the hammerhead shark and basking shark can be seen. Rays and stingrays can also be found in the Alboran Sea. The most common sea turtle in the Mediterranean and the Alboran Sea is the loggerhead turtle. Additionally, though infrequently, the leatherback turtle and, more sparsely, the green turtle are spotted. Cetacean species (marine mammals) recorded in the Alboran Sea are: striped dolphin, pilot whale, bottlenose dolphin, common dolphin, Risso's dolphin, common beaked whale, fin whale, sperm whales, orca, minke whale and false killer whale. Seabirds are present in substantial numbers; some permanently, while others are observed at certain times during their migration.

**Marine Protected Areas***

Due to the diversity of habitats and its complex geological structures and the oceanographic conditions the Alboran Sea is called the oceanographic ‘motor’ of the Western Mediterranean Sea. In the northern part of the Alboran Sea (Spain) there are several coastal and marine protected sites. Under the Natura 2000 programme a combination of Special Areas for Conservation (SACs) via the Habitats Directive and/or as Special Protection Areas (SPAs) via the Birds Directive from the European Union has been declared. There are in total 34 SACs that cover a total of 118,913 ha in a coastal environment.

Under the Barcelona Convention several marine protected areas were included in the List of Specially Protected Areas of Mediterranean Importance (SPAMI) in the Alboran Sea:

- The Natural Park of the Island of Alboran and underwater surroundings, 26,457 ha;
- The Natural Park of Cabo de Gata-Nijar, 49,547 ha;
- The Natural Park of Acantilados de Maro Cerro-Gordo, 1,815 ha.

These SPAMIs are shown, together with other MPAs, in Figure 3.

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17 Demersal species live on or near the bottom of the sea.
18 Most information has been obtained from MedRas, www.medras.org.
19 Natura 2000 is an EU-wide network of nature protection areas established under the 1992 Habitats Directive. The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats. It is comprised of Special Areas of Conservation (SAC) designated by Member States under the Habitats Directive, and also incorporates Special Protection Areas (SPAs) which they designate under the 1979 Birds Directive. Natura 2000 is not a system of strict nature reserves where all human activities are excluded. Whereas the network will certainly include nature reserves, most of the land is likely to continue to be privately owned and the emphasis will be on ensuring that future management is sustainable, both ecologically and economically; European Commission – DG Environment: natura 2000 network, http://ec.europa.eu/environment/nature/natura2000/index_en.htm.
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In the southern part of the Alboran Sea, Morocco has created the National Park of Al Hoceima, covering 48,000 ha of which 19,600 ha has been declared as a Specially Protected Area of Mediterranean Importance (SPAMI)\(^{20}\).

In Algeria, the Islands of Habibas (at 8.7 km from Cabe Cigala) have been declared Marine Nature Reserve in 2003 and as SPAMI in 2005, covering 2,740 ha of marine environment.

Figure 6 shows an overview of all MPAs in the Alboran Sea, including the size of the areas.

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\(^{20}\) Université Mohamed V – Agdal, e-mail August 31, 2010; SPAMI = Specially Protected Area of Mediterranean Importance. These are sites of importance for conserving the components of biological diversity in the Mediterranean. They contain ecosystems specific to the Mediterranean area or the habitats of endangered species and are of special interest at the scientific, aesthetic, cultural or educational levels.
Fisheries Reserves
Fisheries Reserves are protected areas created for conservation purposes and for the sustainable use of fisheries resources. There are two fisheries reserves in the Alboran Region:
- The Fishery Reserve of Cabo de Gata-Nijar since 1995;
- The Fishery Reserve of the Alboran Island created in 1997, with a belt of 0.8 km.

Wetlands
Most of the coastal wetlands of the Alboran Sea are under protection by international and national legislation. In Andalucia, the most important wetlands are:
- Salt ponds of Cabo de Gata, Almería with two wetlands (437.5 ha), also Ramsar Site;
- Cabe Entinas-Sabinar, Almería with three wetlands (804.4 ha), also Ramsar Site: 1 948 ha;
- Albufera Honda: 15 ha (Almería);
- Albufera Nueva: 32 ha (Almería);
- Wetlands of Río Palmones: 58 ha (Cádiz);
- Mouth of River Guadiaro: 27 ha (Málaga);
- Mouth of River Guadalhorce: 67 ha (Málaga);
- Mouth of River Vélez: 12.18 ha (Málaga);
- Lake of Suárez: 13.78 ha (Granada).

In Morocco, the three important wetlands are also declared Ramsar:
- Estuary of Moulouya: 3 000 ha;
- Lake of Nador (Sebkha Bou Areg): 14 000 ha (also known as Mar Chica);
- Cabo Tres Forcas: 5 000 ha.

In Algeria, the Ramsar site of the Alboran Region is in Macta marsh (Oran) and consists of 44 500 ha.

Other measures
Another example of a conservation strategy is the establishment of a 'Traffic Separation Scheme' along the coastal site of the Cape of Gata in Almeria (Spain) that helps to protect an important zone
for cetaceans, increasing traffic safety and reducing the risk of contamination events. Another traffic separation scheme is located in the Strait of Gibraltar.

b/ Maritime transport

The Alboran Sea is an important shipping route since all ships entering the Mediterranean Sea from the Atlantic Ocean (and vice versa) pass the Strait of Gibraltar and the Alboran Sea. Moreover, the port of Gibraltar and the port of Algeciras were the two largest Mediterranean ports (in 2006) in terms of total DWT (Deadweight Tonnage\(^{21}\)). In fact, Gibraltar is by far the largest port in terms of DWT, what is mainly caused by the fact that this port is used by many large ships as a bunkering place. The ranking of the largest ports in the Mediterranean is presented in Table 1 and an overview of the average vessel size in ports is illustrated in Figure 7.

**Table 1:** Top ten ports in Mediterranean by number of calls – 2006

<table>
<thead>
<tr>
<th>Port</th>
<th>No. Unique Vessels</th>
<th>No. Calls</th>
<th>Total DWT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barcelona</td>
<td>1,775</td>
<td>9,112</td>
<td>132,272,844</td>
</tr>
<tr>
<td>Leghorn</td>
<td>1,278</td>
<td>6,953</td>
<td>79,246,383</td>
</tr>
<tr>
<td>Genoa</td>
<td>1,331</td>
<td>6,924</td>
<td>111,939,020</td>
</tr>
<tr>
<td>Gibraltar*</td>
<td>3,812</td>
<td>6,822</td>
<td>312,509,938</td>
</tr>
<tr>
<td>Valencia</td>
<td>1,066</td>
<td>5,776</td>
<td>109,524,853</td>
</tr>
<tr>
<td>Algeciras</td>
<td>1,740</td>
<td>4,844</td>
<td>160,730,519</td>
</tr>
<tr>
<td>Alexandria(EGY)</td>
<td>1,880</td>
<td>4,801</td>
<td>58,506,026</td>
</tr>
<tr>
<td>Piraeus</td>
<td>1,488</td>
<td>4,712</td>
<td>79,055,659</td>
</tr>
<tr>
<td>Algiers</td>
<td>871</td>
<td>4,615</td>
<td>39,810,728</td>
</tr>
<tr>
<td>Venice</td>
<td>1,300</td>
<td>4,480</td>
<td>57,910,567</td>
</tr>
</tbody>
</table>

*Mainly Bunkering Calls

**Source:** REMPEC, Study of Maritime Traffic Flows in the Mediterranean Sea; Lloyds MIU data

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\(^{21}\) Deadweight tonnage (DWT): displacement (total weight of the ship, including crew, passengers, cargo, fuel, water etc.) at any loaded condition minus the lightship weight (weight without crew, passengers etc.). DWT is measured in tonnes/metric tons.
An overview of the most important maritime traffic routes in the Mediterranean, including the relative sizes of ports, is shown in Figure 8. The relative importance of the Alboran Sea and the ports in the Strait of Gibraltar can be clearly seen in this figure. Figure 9 zooms in on the Alboran Sea.

Source: REMPEC, Study of Maritime Traffic Flows in the Mediterranean Sea; Lloyds MIU data
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Figure 9: Traffic routes in the Alboran Sea

Source: REMPEC, Study of Maritime Traffic Flows in the Mediterranean Sea; Lloyds MIU data

The majority of ships pass through the Alboran Sea without a stop, but ships increasingly dock in the ports of Algeciras and Malaga. Moreover the port of Tanger has experienced growth in calls due to port development (and given shifts in traffic from Algeciras towards Tanger). In 2007 a new port, the Tanger-Med port, was opened. This port is the largest in Africa and the Mediterranean in terms of capacity with a capacity of 3 million containers. An additional capacity of 5 million containers will be developed by 2016 (Tanger-Med II). Its expected capacity figures for 2015 are: 7 million passengers, 10 million tonnes of hydrocarbons, 2 million vehicles and 700 000 trucks. In Algeria, maritime traffic and port activities are also of importance, especially for hydrocarbons. Nearly 80 million tonnes of hydrocarbons pass through Algerian oil terminals. Just over 25% of global traffic trading ships (some 60 000 times a year) use the Alboran Sea, making it the world’s second busiest sea route. In Figure 11 the total number of transits in the Strait of Gibraltar is presented, including the vessel types.

Shipping involves a significant and ongoing risk of accidents and/or accidental spills, for hydrocarbons in particular. Figure 10 shows an indication of oil spills in the Alboran Sea, together with the image density (number of satellite images that were used for searching oil spills).

The ballast water of ships can lead to another effect on the marine environment. Ballast water is used by ships to reach a certain draft for stability purposes. When a ship is not (fully) loaded, water is added in the port of departure. When the ship is subsequently loaded with cargo in another port, the water is discharged because the cargo will provide the necessary weight. In ballast water, invasive species may be present, which can have an impact on the flora and fauna of the sea if it is discharged.

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23 If ferries between Spain and Morocco are included a total of more than 90 000 is reached; IUCN, 2007,*Conservation et Développement Durable de la Mer d’Alboran: éléments stratégiques pour sa gestion future;* REMPEC, 2008, *Study of Maritime Traffic Flows* states that in 2006 approximately 64 000 transits took place in the Strait of Gibraltar.
into the sea\textsuperscript{24}. The size of the ports located in or near the Strait indicates that the possibility of the introduction of invasive species in this region is considerable.

**Figure 10: Possible oil spills in 2004 (based on satellite images) and image density**

![Image of possible oil spills and image density](http://serac.jrc.it/index.php?option=com_content&task=view&id=42&Itemid=89)

Another unfavourable effect of shipping is noise, especially for marine mammals since they depend on sound. Shipping constantly produces acoustic pollution, which may affect large areas. Sound travels five times faster in water than in air since the density of water transmits acoustic energy much more efficiently. Hence, noise may extend throughout large volumes of water\textsuperscript{25}. The volume of shipping in the Mediterranean Sea results in high background noise levels that are likely to make it more difficult for cetaceans to communicate with each other or to receive acoustic cues, for example to detect approaching vessels or other hazards. There appears to be a relation between noise and collisions with whales (although there is a lack of research). Noise may induce animals to abandon areas otherwise beneficial to them, or to deviate from their usual migration routes. Also the existence of ports has an impact on the environment due to noise and water pollution (e.g. oils spills during bunkering in port of Algeciras)\textsuperscript{26}.

**Figure 11: Number of transits and vessel types in the Strait of Gibraltar – 2006**

![Graph of transits and vessel types](http://serac.jrc.it/index.php?option=com_content&task=view&id=42&Itemid=89)

Source: REMPEC, Study of Maritime Traffic Flows in the Mediterranean Sea; Lloyds MIU data

\textsuperscript{24} International Union for Conservation of Nature (IUCN), *Marine Menace – alien invasive species in the marine environment*.

\textsuperscript{25} IUCN, 2008, *Maritime traffic effects on biodiversity in the Mediterranean Sea – Volume 1*.

\textsuperscript{26} According to the University of Seville, on average once a month a collision or oil spill occurs in the bay of Algeciras.
In order to reduce the risk of collisions between large vessels in high risk areas due to the concentration of large numbers of such vessels, the International Maritime Organization (IMO) established mandatory routes in these areas of heavy traffic, so called ‘traffic separation schemes’. These schemes avoid potential dangerous situations between vessels by ordering ships to follow a specific route. Advantages, besides reducing the risk of collisions, are better opportunities for fisheries development and an enhanced functioning of rescue operations. In the Alboran Sea two of these separation schemes have been established: one in the Strait of Gibraltar and the other south of Cabo de Gata, the latter coming into force in 1998. They are presented in Figure 12.

Figure 12: Main maritime routes in Alboran Sea

In 2006, the traffic separation scheme near Cabo de Gata was moved from 5 to 20 miles to the south. This measure was the result of a proposal from the Spanish Directorate General of Merchant Marine to the IMO and was supported by UNESCO. This area is a proposed Special Area of Conservation for the bottlenose dolphin and the loggerhead turtle. Since it is a valuable area and significant risks of collisions and oil spills exist, a relocation of the separation scheme proved to be necessary. Due to the relocation the area has become quieter, which positively influences the conditions for marine species, including the dolphins and turtles. Figure 13 shows the new traffic separation scheme.
c/ Fisheries and mariculture

Fishing and mariculture (sea-based aquaculture) are significant maritime activities in the Alboran Sea. Each activity is elaborated upon below.

Fishing

In the Mediterranean part of the Andalucian coast, the annual catch amounts to approximately 29 000 tonnes27 (2005). In the Atlantic part about 47 000 tonnes are caught, which shows that fishing is more important in the Atlantic part. This difference is also illustrated in Figure 14, where the Atlantic part of Andalucia seems to be more dependent on fisheries than the Mediterranean part. Stakeholders confirmed that the Alboran part of Andalucia is not as productive as the Atlantic part.

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27 According to statistics of the Consejería de Agricultura y Pesca of the Junta de Andalucía: Cuenta satélite de la pesca en Andalucía.
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Figure 14: Dependence on fisheries per fishery port in Andalucia (light colour means low dependency, dark means high dependency)

Source: Junta de Andalucia, 2008, Producción Pesquera Andaluza

According to the statistical bureau of Andalucia approximately 1 500 vessels were in operation in Andalucia in 2008. According to FAO, the fisheries fleet in Andalucia consists of about 2 000 ships28, providing an impression of the, importance of Andalucian fisheries sector. The most common types of fishing in the northern sector of the Alboran Sea are: bottom trawling, purse seine, gillnet fisheries, longline fisheries. An overview of the fishing fleet segments is given in Table 2. Most fishing vessels are being used for artisanal29 fishery in Andalucia.

Table 2: Segments of the fishing fleet and their characteristics

<table>
<thead>
<tr>
<th>Fleet segment</th>
<th>Definition</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Minor gears OoS</td>
<td>Multipurpose, &lt; 6 m. length</td>
<td>1 to 3 people; Onboard engine; Gillnets predominantly</td>
</tr>
<tr>
<td>2. Bottom Trawler</td>
<td>Trawler &gt;300 HP</td>
<td>Practical working depth &gt; 200 metres</td>
</tr>
<tr>
<td>3. Small Trawler</td>
<td>Trawler &lt;299 HP</td>
<td>Practical working depth &lt; 200 metres</td>
</tr>
<tr>
<td>4. Medium Purse Seiner</td>
<td>Seine &gt; 30 GRT</td>
<td>Works close to coastline</td>
</tr>
<tr>
<td>5. Small Purse Seiner</td>
<td>Seine &lt; 29 GRT</td>
<td>Target species: large pelagics (tuna, swordfish)</td>
</tr>
<tr>
<td>6. Surface Longliner</td>
<td>Longliner &gt; 6 m. length</td>
<td>All-year-round activity; not found in Spain</td>
</tr>
<tr>
<td>7. Longliner + Seiner</td>
<td>Longliner + Seiner</td>
<td>2 or 3 people; Target species: molluscs; not found in Morocco</td>
</tr>
<tr>
<td>8. Drag</td>
<td>Drag</td>
<td>1 to 3 people; Onboard engine; Gillnets predominant; Not found in Morocco</td>
</tr>
<tr>
<td>9. Minor gear OnS</td>
<td>Multipurpose, &gt;6 and &lt;10 m. length</td>
<td></td>
</tr>
</tbody>
</table>

Source: GFCM/FAO, 2001, Feasibility Assessment for a Database on Socio-Economic Indicators for Mediterranean Fisheries,

29 Artisanal fisheries: traditional fisheries involving fishing households (as opposed to commercial companies), using relatively small amount of capital and energy, relatively small fishing vessels, making short fishing trips, close to shore, mainly for local consumption. In practice, definition varies between countries, e.g. from gleaning or a one-man canoe in poor developing countries, to more than 20 m trawlers, seiners, or long-liners in developed ones. Artisanal fisheries can be subsistence or commercial fisheries, providing for local consumption or export. Sometimes referred to as small-scale fisheries; FAO, Glossary.
For the Moroccan Mediterranean coast, fishing can be considered as one of the most important socio-economic activities in certain provinces. The production in 2009 was 39 000 tonnes, with a value of around € 33 million. In the Moroccan zone it is estimated that some 2 500 boats (not always active) employ around 7 800 fishermen with approximately 90 landing sites, half of which are isolated and generally have no infrastructure for fishing or recovery of the catch.

In Algeria fishing is also an important economic sector. In 2008, fish production was approximately 128 800 tonnes. In 2001 the fleet consisted of around 2 600 vessels. The percentage of the catches and boats related to the Alboran Sea is unknown.

Demersal fishery in the Spanish zone includes a fleet of about 300 vessels used for capturing molluscs and a fleet of about 160 boats that captures more than a hundred species. This type of fishing generates a significant number of jobs. The trawler fleet fishing in Moroccan waters consists of about 144 boats and a part of ships with mixed activities (an undetermined number of 66 ‘mixed’ ships).

Commercial tuna fishing in the Spanish zone is carried out by about 25 surface longliners. There is also an undetermined number of small purse seiners that capture small bluefin tuna and other smaller fish. Fishing for tuna and related species also leads to the capture of other species (as bycatch). In particular sharks and some species of mammals and sea turtles are caught, which may impact the ecosystem.

In Morocco, driftnets are used (banned by the EU, the General Fisheries Commission for the Mediterranean (GFCM) and International Commission for the Conservation of Atlantic Tunas (ICCAT)), through specific regulations. This fishing technique is used for catching swordfish but is considered to be unsustainable, since it leads to a high bycatch of different species. In particular, sharks and some species of mammals and sea turtles are caught, which may impact the ecosystem. The European Union prohibited the use of driftnets in 2002. In 2007 the King of Morocco signed an agreement to subsidise the phasing out of illegal driftnet fishing and in August 2010 an amendment to the Law on the organisation of fishing has been published that will prohibit to use, possess, manufacture or sell driftnets. Consequently, the use of driftnets is likely to decrease strongly. By-catch estimates by the WWF in 2003 for a 12-month period by the whole Moroccan driftnet fleet yielded a figure of approximately 1 500 - 2 000 striped dolphins and 1 500 - 2 000 short-beaked

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32 FAO, Yearbook of fishery statistics.
34 Demersal fish live on or near the bottom of the sea.
36 Council regulation 1239/98 of the European Union.
37 WWF, 2003, Biodiversity impact of the Moroccan driftnet fleet in the Alboran Sea. A case study of the harmful effects inflicted by current IUU large-scale driftnet fleets in the Mediterranean on Protected and vulnerable species.
common dolphins in the Alboran Sea alone; according to the estimates a further 13 000 were killed annually by the fleet based in Tangier around the Straits of Gibraltar and neighbouring areas, mostly outside the Mediterranean Basin. Moreover 77 500 sharks were caught by the fleet of Tangiers, according to the 2003 estimations\(^{38}\). This shows that around the Strait of Gibraltar (port of Tangier) the problem of bycatch was substantial.

Tuna species of great importance for the Alboran Sea are bluefin tuna, albacore and small tuna species such as bullet tuna, bonito south or bonito, yellowfin and occasionally, skipjack and bonito. Swordfish (a related species) is also caught. The annual average catch of all tuna and related species in the Alboran Sea and the Strait of Gibraltar (1998-2004) conducted with all the gear by Spain and Morocco amounts to some 6 300 tonnes (40% Spanish catches and 60% Moroccan).

**Recreational fishing**
Recreational fishing in Spain, taking place on the coast and on pleasure boats, has an upward trend. From an environmental point of view the impact on fish stocks is significantly lower than commercial fishing. Knowledge and control of recreational fishing have always been scarce in the area, but efforts are made to improve this. In 2006, the first Mediterranean Congress of Salt Water Recreational Angling was held.

**Mariculture**
Aquaculture in Andalucia is a long lasting tradition. For many decades Andalucia has been one of the main producers of aquaculture fish at national and European scale. The Andalucian coast has multiple possibilities for carrying out mariculture. The main characteristics of this sector are the heterogeneity of the cultivation systems and the species produced, taking advantage of the various types of coastal environments. The production of mariculture in Andalucia in 2008 was 6 700 tonnes, with a value of € 35.4 million\(^{39}\). The contribution of the Alboran area to this total is unknown. Production on land was 2 200 tonnes (in 2005). *Figure 15* shows the locations of these farms in Andalucia.

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\(^{38}\) WWF, 2003, *Biodiversity impact of the Moroccan driftnet fleet in the Alboran Sea. A case study of the harmful effects inflicted by current IUU large-scale driftnet fleets in the Mediterranean on Protected and vulnerable species.*

\(^{39}\) Statistical bureau of Andalucia.
In the northern part of the Alboran Sea, the Andalucian government is making efforts to promote mariculture. It has done a study on the location of areas suitable for mariculture to identify potential areas, to promote communication and coordination between administrations, improve administrative processes and facilitate access to developers. There are more than twenty aquaculture facilities in operation on land and sea (rafts, floating cages, long-lines). It should be noted that cultivation of mussels on long-lines and rafts in the province of Malaga has started, and is expected to reach 400 units. The first results are positive since the mussels reach commercial size faster than in the Galician Rias, which implicates a possibility for profitable development. In this light a centre for the treatment of molluscs has been created in Malaga.

In Morocco aquaculture activities are limited. There are doubts about its potential and the evaluation of its benefits. This uncertainty and long term risks hamper the realisation of private initiatives and have caused the gradual decline over the past years. During the 1990s, the National Fisheries Research Institute (NHRI) and Overseas Fishery Cooperation Foundation (OFCF) of Japan have started a M'Diq, a unit of aquaculture for bluefin tuna. Results have not been encouraging. Currently, the NHRI tests aquaculture of new species such as snapper, dentex, groupers and lean. A national plan has been developed to increase production of aquaculture to 100 000 tonnes in 2020. The ‘National Agency for the Development of Aquaculture’ (established in 2009) will promote aquaculture in the country by helping implement government policies. Aquaculture production in Algeria is limited. Approximately 400 tonnes were produced in 2007.

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40 On the national level, a National Observatory for Aquaculture has been established, whose objectives are: i) increasing R&D, ii) facilitate the exchange of information between researchers, government- public and private agencies and businesses and iii) bringing aquaculture to social collectives.

41 IUCN, 2007, Conservation et Développement Durable de la Mer d’Alboran: éléments stratégiques pour sa gestion future.

42 Agence Maghreb Arabe Presse, www.mapa.ma/eng/sections/see_also/morocco_to_create_aq/view.
The need for MSP in the Alboran Sea basin

d/ Tourism

Andalucia has a prominent position in the tourist market both nationally and internationally. The Spanish coast of the Alboran Sea, particularly the so-called Costa del Sol, is one of the most important tourist destinations around the Mediterranean. In total 22.1 million tourists visited Andalucia in 2009\(^4\), primarily for coastal and marine tourism (around 60% of the tourists\(^5\)).

Different kinds of tourism activities take place in Andalucia. The tourism plan of Andalucia categorises destinations in different tourism activities, such as: sun and beach, cultural destinations, rural-nature areas, golf areas and cruises. In Figure 16 the importance of the coastal areas in the tourism industry is illustrated.

**Figure 16: Tourism activities in Andalucia**

The evolution of the total arrivals has grown in all Andalucian provinces since 2000 with an average rate of 26% (data from 2007). Some coastal tourism areas have been overexploited through excessive pressure on fragile natural resources and overcrowding resulting in congestion. Because the water purification system cannot cope with large numbers of people, the wastewater is discharged directly to the sea (without treatment). Coastal tourism is therefore seen as one of the main contributors to environmental pressure in the Alboran Sea. Tourism, however, is of vital importance to the economy of Andalucia, representing 11.0% of the GDP, with revenues of € 15.6 billion in 2006\(^6\).

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\(^6\) Statistical information Andalucia: Tourism in Andalucia (3\(^{rd}\) trimester 2008).

Coastal tourism in Morocco has increased strongly in recent years. Approximately three to four million tourists visit the Mediterranean coast of Morocco each year. Also Morocco experiences pressure on the environment due to the large number of tourists.

**e/ Oil and gas (seismic research)**

Seismic research (2D) and exploratory drilling have been activities in the Alboran Sea for more than 30 years. During the 1980s three exploration wells were drilled. None of these surveys found evidence of a significant presence of oil in the basin. In 2005 the project Siroco was launched by the Spanish oil company Repsol, focusing on the search for natural gas. It included the reprocessing of 2 000 km of old 2D seismic lines recorded by companies that previously explored the area, the acquisition of a seismic 3D campaign (to the west of the meridian of Malaga) and a test-drilling in case the decision was made to continue the exploration permits after the third year. In 2008 a new license was given to Repsol to continue the project by exploring area D (in previous years area A, B and C were surveyed, see Figure 17). Area D is located to the right of area C.

**Figure 17: Siroco A, B and C**

Seismic research leads to the production of noise by shooting airguns. In order to mitigate the effects of noise on marine mammals Repsol applied the Joint Nature Conservation Committee (JNCC) guidelines, which is a UK initiative. A marine mammal observer (MMO) is on board of the ship during seismic research and controls whether the guidelines are being followed. The MMO’s report of the research in Sirocco A concludes that Repsol complied with the guidelines. Although complying with the guidelines, the shooting of airguns might still lead to a negative impact on the mammals.

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47 According Moroccan stakeholders.
48 No information is available about whether this drilling has taken place or not.
**Wind energy**

Due to other economic activities at sea and environmental considerations (e.g. protected areas), not all locations are suitable for wind energy. Therefore, investigations on the coastline of Spain were made to determine the potential areas for offshore wind farms in Spain\(^{51}\). The qualification of the coastal zones is shown in Figure 18. Subsequently, offshore projects were submitted. The submissions of projects in the south of Spain are illustrated in Figure 19. One project has been submitted for the Alboran Sea, near Almeria\(^{52}\). None of these projects have been approved yet.

**Figure 18: Suitable locations for offshore wind energy in Spain**

\(^{51}\) Assessment study by the Ministerio de Medio Ambiente y Medio Rural y Marino.

Military activities

An important naval base near the Alboran Sea is located in Cartagena with stocks of weapons, ships and a submarine fleet. Cartagena is also a frequent port of call for other ships and submarines of the NATO fleet. Another important naval base is located in Gibraltar. Its naval docks also are an important base for the NATO and American and British nuclear submarines frequently visit the berths. A third important military base, though outside (in the Atlantic) but near the Alboran Sea, is located in Rota.

Given the strategic military position of the Alboran Sea and the Strait of Gibraltar and the proximity of the important naval bases, military manoeuvres in the Alboran Sea take place on a frequent basis. This includes exercises such as firing, underwater explosions and use of powerful sonar. Apart from navigation, the noise resulting from these exercises may have an additional negative impact on marine mammals and fish. Also the presence and transit of nuclear submarines involves a certain risk.

Desalination

Among the priority activities under the Water Programme of the Spanish Ministry of Environment (Law 11/2005), the construction and expansion of desalination plants in the Mediterranean basin has been approved, which will implicate an additional impact on the coastal zone according to a Strategic Environmental Assessment.
Spain ranks fourth in the top 10 of countries that desalinate water, contributing 8% to the total worldwide desalinated water production\textsuperscript{53}. Desalination plants are also located along the shore of Algeria, ranking sixth in the same top 10 (4% of world production). The environmental impacts due to the operation of desalination stations are basically related to the disposal of brine, which is likely to impact water ecosystems and cause a deterioration of water quality\textsuperscript{54}. 

\textbf{i/ Beach nourishment}

Some beaches are artificially regenerated through beach nourishment. If not carried out correctly, significant damage to marine species and habitats can result. In addition, coastal development has resulted in beaches that continuously lose sand because of sediment transport, which implicates that these beaches need to be regenerated periodically to be sustained. The more this nourishment needs to take place, the more the environment is affected. In Spain, before nourishment takes place, the extraction area is studied in order to reduce the effects on ecosystems. In Morocco, a few years ago extraction of sand took place illegally, particularly in the area of M'diq and in the Bay of Al Hoceima\textsuperscript{55}. Studies by the INRH (Institut National de Recherche Halieutique) in the area of Wilaya de Tetouan of the impact on fishery resources have identified negative effects on the eggs and larvae of fish and the benthic\textsuperscript{56} flora and fauna. In 2007 the INRH was part of an inter-ministerial committee which mission was to provide scientific advice about the impact of sand mining on the environment.

\textsuperscript{53} EMWIS, www.emwis.org/topics/Desalination.
\textsuperscript{54} UNEP/MAP, 2009, \textit{State of the environment and development in the Mediterranean}.
\textsuperscript{55} IUCN, 2007, \textit{Conservation et Développement Durable de la Mer d’Alboran: éléments stratégiques pour sa gestion future}.
\textsuperscript{56} The benthic zone is the ecological region at the lowest level of a body of water.
III. THE APPLICATION OF MSP IN THE ALBORAN SEA BASIN

The following sections are structured following the MSP key principles. After detailing the area and the type and density of the activities taking place in the region, stakeholder involvement and the legal and institutional framework are discussed. Next, the cross-border/international cooperation and consultation is discussed, followed by the data collection, monitoring and evaluation of marine and maritime-related topics. The chapter ends with the coherence between terrestrial and Maritime Spatial Planning.

III.1. AREA AND TYPE OF ACTIVITIES

A maritime spatial plan may not need to cover a whole area but should be based on the type of planned or existing activities and their impact on the environment (MSP key principle 1 and 2)

Certain areas in the Alboran Sea are intensively used for different activities and at the same time these areas are of significant environmental importance.

One of the busiest marine areas in the Mediterranean Sea is the Strait of Gibraltar. The relatively narrow Strait is one of the most frequent used sea routes in the world. This competes with other maritime activities, but primarily impacts the marine environment due to noise and oil spills. Especially the bunkering of ships in the bay of Algeciras is a cause of concern, since oil spills seem to be frequent. Mostly bunkering takes place at sea in this area, which makes it difficult to control bunkering procedures. Finding a solution for oil spills and collisions in this bay is challenging because no agreement has been reached about the maritime border between Spain and the United Kingdom (Gibraltar). This issue complicates the establishment of a coordinated effective approach to improve safety in this bay.

Besides the Strait of Gibraltar, the coastal waters near the touristic beaches in Spain are also under pressure. Here, the most important activities are fishing and tourism activities, although these areas

58 According to the University of Seville oil spills or collisions take place on average once a month.
Exploring the potential of maritime spatial planning in the Mediterranean

are also important for marine vegetation (sea grasses). Furthermore, several areas along the coast are highly productive\textsuperscript{59}. Besides fishing and maritime tourism activities, land-based activities also negatively impact the environment. In particular, non-purified water discharges from coastal cities and industrial and agricultural activities lead to eutrophication\textsuperscript{60}, which can have negative effects on stocks of fish and shellfish due to a loss of oxygen. The water quality also decreases due to eutrophication, leading to problems for recreational bathing and fishing.

According to experts, the current protected areas in the Alboran Sea are often too small, implicating that these areas are relatively vulnerable to maritime (or land-based) activities nearby. Moreover, the experts believe that activities taking place in the protected areas also affect these areas and should therefore be limited. For example, some protected areas are frequently visited by tourists and are used for fishing (on a small scale). Fishing just outside these small-sized protected areas also leads to undesirable effects for fish stocks\textsuperscript{61}.

III.2. NATIONAL STAKEHOLDER PARTICIPATION

\textit{In order to achieve broad acceptance, ownership and support for the implementation of MSP, it is important to involve all stakeholders at the earliest possible stage in the planning process (MSP key principle 4)}

The stakeholders listed in Table 3 are included based on their competences in the field of (maritime) spatial planning, maritime activities and 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 for MSP.

\textsuperscript{59} Due to vertical movements (upwellings) caused by streams, nutrients on the bottom of the sea go up, leading to abundant nurture areas used by fish for spawning.

\textsuperscript{60} Eutrophication: excessive nutrients in a lake or other body of water, usually caused by runoff of nutrients (animal waste, fertilizers, sewage) from the land, which causes a dense growth of plant life; the decomposition of the plants depletes the supply of oxygen, leading to the death of animal life.

\textsuperscript{61} Spanish Institute for Oceanography, meeting in Malaga on 27 April 2010.
Table 3: Relevant stakeholders in the Alboran Sea basin

<table>
<thead>
<tr>
<th></th>
<th>Spain</th>
<th>Morocco</th>
<th>Algeria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>National</strong></td>
<td>Ministry of Environment and Rural and Marine Affairs</td>
<td>Ministère de l’Habitat, de l’Urbanisme et de l’Aménagement de l’Espace</td>
<td>Ministry of Spatial Planning, the Environment and Tourism</td>
</tr>
<tr>
<td></td>
<td>Ministry of Science and Innovation</td>
<td>Secrétariat d’Etat charge de l’Eau et de l’Environnement</td>
<td>Ministry of Fisheries and Fishery Resources</td>
</tr>
<tr>
<td></td>
<td>Ministry of Public Works and Transport</td>
<td>Ministère de l’Agriculture et de la Peche Maritime</td>
<td>Ministry of Transport</td>
</tr>
<tr>
<td></td>
<td>Ministry of Industry, Tourism and Commerce</td>
<td>Ministère de l’Équipement et des Transports</td>
<td>Ministry of Energy and Ministry of Public Works</td>
</tr>
<tr>
<td></td>
<td>Other ministries, such as Defence, Interior, Economy and Finance, Culture, Employment and Immigration, Foreign Affairs and Cooperation</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Regional / local</strong></td>
<td>Ministries in Andalucia: ‘Environment’ and ‘Agriculture and Fisheries’</td>
<td>Commissariat aux Eaux et Forêts et a la lutte contre la Désertification l’Agence de l’Oriental l’Institut National de la Recherche Halieutique</td>
<td>Observatory of the Environment and Sustainable Development (ONEDD) National Centre for the Development of Biological Resources (CNDRB)</td>
</tr>
<tr>
<td></td>
<td>Other regional ministries, provinces and municipalities</td>
<td>IUCN</td>
<td>IUCN</td>
</tr>
<tr>
<td><strong>Other stakeholders</strong></td>
<td>Spanish Institute of Oceanography (IEO)</td>
<td>IUCN</td>
<td>IUCN</td>
</tr>
<tr>
<td></td>
<td>IUCN</td>
<td>IUCN</td>
<td>IUCN</td>
</tr>
<tr>
<td></td>
<td>University of Seville</td>
<td>IUCN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CMIMA</td>
<td>IUCN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IMEDIA</td>
<td>IUCN</td>
<td></td>
</tr>
</tbody>
</table>

Source: Policy Research Corporation

More information on the competences and activities of the different stakeholders will be provided in sections III.3 and III.5. In these sections the responsibilities and activities of the ‘other stakeholders’ will also be elaborated.

**Spain**

On the one hand, the national government is responsible for certain activities in the territorial sea; the autonomous governments (i.e. regional government) have a consulting role in this matter. The autonomous regions on the other hand, are responsible for fishing in internal waters, mariculture, small ports (for commercial, fishing and nautical purposes) and management of MPAs\(^{62}\). With regard to national public authorities the Ministry of Environment and Rural and Marine Affairs will always be involved. Depending on the issue, different additional ministries can be involved such as ‘Economics and finance’, ‘Industry, trade and tourism’ and ‘Public works’. The same situation is present on the level of the autonomous community of Andalucia. Here the Ministry of Environment

\(^{62}\) ICZM Strategy Spain - Gestión Integrada de las Zonas Costeras en España.
will be involved, and ministries such as ‘Agriculture and fisheries’, ‘Economics, innovation and science’, ‘Public works and housing’ and ‘Tourism, trade and sports’. Depending on the issue, municipalities may need to be involved as well.

**Morocco**

The national government is responsible for activities in the territorial sea. With regard to national public authorities the Secretary of State for Water and the Environment (within Ministry of Energy, Mines, Water and Environment) will always be involved. Depending on the type of Maritime Spatial Plan other ministries can be involved with responsibilities such as fisheries. A relevant research institute is INRH, which focuses on fisheries research.

**Algeria**

Also in Algeria the national government is responsible for activities in the territorial sea. The Ministry of Spatial Planning, the Environment and Tourism is the responsible authority for these matters, but depending on the activities concerned, other ministries can be involved. Several ministries also have decentralised institutions or local missions through Wilaya departments or specialised cells, which are involved in Integrated Coastal Zone Management and Maritime Spatial Planning in Algeria. Other stakeholders involved are the National Observatory for the Environment and Sustainable Development (ONEDD) and the National Office for the Coast (CNL).

**International**

The three countries have agreed to cooperate on the protection of the Alboran Sea. Representatives from research institutes, universities, governments and NGOs are involved in this project, which is coordinated by IUCN. More information about this initiative is provided in paragraph III.4.

### III.3. INSTITUTIONAL AND LEGAL FRAMEWORK

*Maritime Spatial Planning needs a streamlined decision process, sufficient coordination and transparency among administrative authorities and should be legally binding (MSP key principle 3, 5 and 6)*

*Table 4* presents the national institutions and laws regarding coastal and maritime planning in each of the three countries surrounding the Alboran Sea.
Table 4: Institutional and legal framework

<table>
<thead>
<tr>
<th>Level of responsibility for coastal planning</th>
<th>Spain</th>
<th>Morocco</th>
<th>Algeria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Autonomous Communities State</td>
<td>State</td>
<td>State</td>
</tr>
<tr>
<td>Responsible ministry for coastal planning</td>
<td>Ministry of Environment and Rural and Marine Affairs</td>
<td>Ministry of Spatial Planning, Water and Environment</td>
<td>Ministry of Territorial Planning and Environment</td>
</tr>
<tr>
<td>Legal basis for coastal planning</td>
<td>Spanish Shores Act (Law 22/1988)</td>
<td>Law on the protection and valorisation of the environment; Draft law on the Planning, Protection, Valorisation and Conservation of the Littoral</td>
<td>National Spatial Plan; Law Protection and Valorisation of the Coast (Law no. 02-02); Law on Environmental Protection (Law no. 83-03)</td>
</tr>
<tr>
<td>Level of responsibility for maritime planning</td>
<td>State</td>
<td>State</td>
<td>State</td>
</tr>
<tr>
<td>Responsible ministry for maritime planning</td>
<td>Ministry of Environment and Rural and Marine Affairs (coordinating role) and other ministries</td>
<td>Different ministries (sectoral approach)</td>
<td>Different ministries (sectoral approach)</td>
</tr>
<tr>
<td>Legal basis for maritime planning</td>
<td>Draft Law for the Protection of the Marine Environment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Policy Research Corporation

Spain

Spain has a relatively complex legal-administrative organisation. The country consists of autonomous communities, which are subdivided in provinces and municipalities. In the Spanish Constitution powers are divided between the state and the autonomous communities. Regarding maritime affairs, the autonomous regional government of Andalucia is only responsible for fishing in internal waters, mariculture, small ports and the management of MPAs. For other issues, the regional government has a consulting role.

The State is currently working on a (draft) law called ‘Marine Environment Protection’ (‘Ley de protección del medio marino’ Bill 121/000059, 12 March 2010) to develop a strategy for protecting the maritime environment. Its development was triggered by Directive 2008/56/EC, on the Marine Strategy Framework Directive. The current legislation is not sufficient to meet the requirements of the Directive and it lacks a comprehensive policy framework. Hence, this law is being developed, which should provide the necessary uniform and comprehensive framework. According to the draft version, the objective of this law is to establish a legal regime that enables the adoption of measures necessary to achieve or maintain a good status of the marine environment through planning, guardianship and protection.
Different strategies will be developed for different regions in Spain. One of these regions includes the Strait of Gibraltar and the Alboran Sea. All regions have separate environmental objectives; to reach these objectives a program of different measures needs to be established, in collaboration with other public administrations. MSP is considered as one of the measures that can be used to reach the objectives. Integration of MSP as one of the useful measures will improve its acceptance among policy makers. This draft considers regional governments (autonomous communities), but the main power is kept within the central government. Regions will be integrated in Marine Strategy Follow-up Committees, and they will retain their specific competences over the seas, according to which they may contribute to the programmes of measures. However, the main responsibility for drafting and implementing marine strategies lies within the central government.

Spain has ratified the Barcelona Convention ICZM protocol, which will enter into force after six ratifications.

**Morocco**

The legal framework for coastal planning in Morocco is the law on the protection and valorisation of the environment and the law on the Planning, Protection, Valorisation and Conservation of the Littoral. In Morocco a SNAT (*Schéma National d’Aménagement du Territoire*) has been developed to provide the strategy for terrestrial spatial planning. However, at the institutional level, there is no specific body responsible for planning, management and coordination of the coastline. The governance of this space involves a multitude of government departments and public, semi-public or private institutions\(^{63}\). This lack of coordination is disadvantageous for the effectiveness and efficiency of terrestrial (coastal) planning. In addition to the SNAT, different SRAT (*Schémas Régionaux d’Aménagement et de Développement du Territoire*) were developed in order to understand the impact of activities on the environment. Moreover, two master plans were developed for the protection of the coastal environment: a Master plan for the development of Urban Coastal Areas (SDAUL) and a Master plan for the development of Touristic Coastal Areas (SDAULT).

The Barcelona Convention ICZM Protocol has been signed and will soon be ratified and there is a strong will at the national level to stimulate the development of ICZM\(^{64}\). However, the current sectoral approach may lead to difficulties when developing and implementing ICZM.

Morocco is currently (and has been) involved in coastal spatial planning through several projects. In the coastal Rif Central area, a CAMP (Coastal Area Management Programme) project is ongoing. This project is the result of a feasibility study by the Ministry of Spatial Planning, Water and Environment (in cooperation with PAP/RAC\(^{65}\)) to launch a CAMP for the Moroccan Mediterranean

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\(^{63}\) Hannou, E., 2003, *Aménagement du territoire et développement du littoral, cas de la partie septentrionale du Maroc* ; Introduction paper to 2\textsuperscript{nd} FIG Regional Conference (December 2003).

\(^{64}\) According to Université du Mohamed V – Agdal, presentation June 2010.

\(^{65}\) PAP/RAC is an UNEP/MAP Regional Activity Centre of the Barcelona Convention.
coastal zones. The CAMP project is based on ICZM. Two other sites, namely the Estuary of the Moulouya River and the Nador Lagoon were the subject of other ICZM related projects in the period 2006-2008 and were funded under the SMAP III programme (Short and Medium Term Priority Environmental Action Programme) of the European Union.

In the Nador Lagoon the main partners involved were EUCC (the European Coastal and Marine Union) and three Moroccan institutes: l’École National Forestrière d’Ingénieurs, the Commune Rurale de Boudinar and the Forum of Urbanism, Environment and Development. The Action Plan for the province of Nador was completed in May 2009. In partnership with El Kala National Park in Algeria and the Cellule Littoral of the Ministère de l’Habitat, de l’Urbanisme et de l’Aménagement de l’Espace in Morocco, la Tour du Valat, a research centre for the protection of Mediterranean wetlands, implemented an Integrated Coastal Zone Management project for the Moulouya River covering coastal areas which include sensitive wetland areas.

**Algeria**

The National Spatial Plan (SNAT) provides the framework for the management of the coastal areas. An ICZM strategy has been developed within the framework of the National Spatial Plan. Thus, Algeria is making efforts to introduce integrated planning of the coast, although plans for MSP have not yet been developed. The most important law related to MSP is the coastal law (Loi N° 2002-02 du 22 Dhou El Kaâda 1422 correspondant au 05 février 2002) on the protection and valorisation of the coastal zone. The coastal law defines the coastal zone and prescribes the fundamental principles of its use and management. Thereby, the law establishes the framework for developing a national policy on coastal protection. The definition of the coastal zone comprises the natural shoreline, islands and islets, internal waters and the soil and subsoil of the territorial sea.

In addition, the following legislation is of importance to MSP:

- Law laying down the general rules for the use and exploitation of tourist beaches (Loi N° 03-02 du 17 février 2003);

Although the coastal law incorporates parts of the sea (soil and subsoil of the territorial sea) it does not provide a framework for MSP. The government applies a sectoral approach towards planning of the sea; hence, different ministries are involved (Ministry of Spatial Planning, Environment and Tourism, Ministry of Transport, Ministry of Fisheries and Fishery Resources, Ministry of Energy and Mines and Ministry of Public Works). A potential disadvantage of a sectoral approach is the difficulty

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66 The strategy provides the framework for applying MSP and it identifies the relevant circumstances of the current situation in order to establish the foundations of ICZM in Algeria.


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to coordinate and cooperate efficiently. When a legal framework is absent, it is difficult to develop coherent spatial planning with all institutions involved. To what degree problems are experienced with coordination and cooperation between ministries is unknown.

III.4. CROSS-BORDER/ INTERNATIONAL COOPERATION AND CONSULTATION

Cooperation across borders will lead to the development of common standards and raise the overall quality of MSP (MSP key principle 7)

On the international level, Algeria, Spain and Morocco have started to cooperate, in collaboration with IUCN, to protect the Alboran Sea. In 2007, representatives from the three countries from research institutions, universities, governments and NGOs, gathered for the first ‘International Meeting for the Conservation and Sustainable Development of the Alboran Sea’. The meeting was organised jointly by IUCN and the National Institute of Fisheries Research (INRH), with support from the Department of Environment and Territorial Planning of the Provincial Council of Malaga and the Development Agency for East Morocco.

In April 2009 the second meeting was held in Oujda (Morocco). At this meeting, with more than 100 experts and representatives from various institutions and NGOs from Spain, Morocco and Algeria attending, it was agreed that an action plan would be developed for the Alboran region based on the document: ‘Oujda Declaration on the Conservation and Sustainable Development of the Alboran Sea’. The recommendations in the declaration are:

− Better integration and visibility of Alboran governance processes of the Mediterranean, particularly those relating to the Convention for the Protection of the Marine Environment and the Mediterranean Coastal Region (Barcelona Convention);
− Implement a system for regular and reliable information exchange, including all relevant indicators for usage of the marine and coastal environment;
− Develop and harmonise appropriate methodologies for the integrated management of coastal areas on the basis of an ecosystem approach, taking into account the Alboran characteristics and previously developed experiences in this field in coastal areas;
− Strengthen the network of protected areas in the coastal and marine areas, identifying and creating new protected areas and restore habitats in order to protect the Alboran Sea region and to ensure the sustainability of human activities taking place in it;
− Encourage and strengthen cooperation at all levels for the conservation and sustainable development of the Alboran region;
− Create a centre for research and knowledge about marine biodiversity, including new research-based projects, conservation, ecosystem management, information, education/awareness and based on the integration of the experiences of different countries;
− Create multi-disciplinary working groups on priority issues related to the conservation and sustainable development of the region and prepare an action plan for the Alboran;
− Create the ‘Sustainable Development Network Alboran’ to support a permanent monitoring system in the form of an ‘observatory of conservation and sustainable development’ in the Alboran region.
This second meeting has helped to strengthen the process of exchanging information between all the actors and stakeholders in the area, examine the problems and solutions at regional level in greater depth, and identify priorities for improving the management and governance of the Alboran region. These elements will serve as the basis for the next phase that includes a series of activities over the coming years. This initiative shows that a first step has been taken into coordinating the activities in the Alboran Sea. The declaration and the communication between the parties increase the level of coordination of the sea and will help to develop common standards and to raise the potential of MSP in the sea.

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.

The Spanish draft law on protection of the marine environment acknowledges the importance of international cooperation with countries that share the same marine region. The government wants to ensure coherence and coordination of strategies in the same area (Alboran Sea in this case), including monitoring programmes.

III.5. DATA COLLECTION, MONITORING AND EVALUATION

Maritime Spatial Planning has to be based on sound information and scientific knowledge and requires a transparent regular monitoring and evaluation mechanism (MSP key principle 8 and 10)

In Spain the environment department of the autonomous government of Andalucia (Junta de Andalucia) is monitoring the flora and fauna of its coastal waters, including the Alboran Sea. They have in-depth knowledge of the species and vegetation present in the Spanish part of the Alboran Sea. They have mapped the locations of species, vegetation for most specific species and vegetation (over time) along the coastal waters and they know in which (coastal) areas the most critical problems exist. The department of agriculture and fisheries has in-depth knowledge of the current state of fisheries and aquaculture and it monitors the developments that take place.

The Spanish Institute for Oceanography has a branch in Malaga, which also investigates the flora and fauna of the sea. A number of the Institute’s projects are assigned by the government and they act as consultants to the state. The Institute has in-depth knowledge of certain parts of the sea (primarily the territorial sea). According to the Institute, there is a lack of information about the flora and fauna outside the territorial waters and more resources are required to improve the knowledge of the sea.
IUCN, having an office in Malaga, also contributes to research in the Alboran Sea through studies with a Mediterranean scope including the Alboran Sea. IUCN published a study in 2007 (updated in 2010) called ‘Conservation and sustainable development of the Alboran Sea: strategic elements for managing the future’. In this study current maritime activities and environmental issues are described and recommendations are given to maintain and develop the sustainability of the Alboran Sea68.

Furthermore, professor Suarez de Vivero (University of Seville) is currently working on a study called “European Maritime Policy and Spatial Planning: Methodological Application to the Atlantic-Mediterranean Arc”. In this study the Alboran Sea is used as case study. For this case maps were developed of the Spanish part of the Alboran Sea containing information about geomorphology69, ecology and maritime activities. Because the study has not yet been published, these maps cannot be included in this report. However, if a pilot study is started in the Alboran Sea in the future, these maps will be helpful when developing maritime spatial planning in this area.

The Spanish Centre Mediterrani d’Investigacions Marines i Ambientals (Mediterranean Marine and Environmental Centre – CMIMA) belongs to the Consejo Superior de Investigaciones Científicas (CSIC) (Scientific Research Council). The CMIMA is composed of the Institut de Ciències del Mar de Barcelona (ICM) (Institute of Marine Sciences) and the Unitat de Tecnologia Marina (UTM) (Marine Technology Unit). The goal of the CMIMA consists of further expanding and deepening its scientific understanding of the seas and oceans. As a governmental research centre, it has the task of reporting and disseminating the knowledge generated by its activities.

The Institut de Ciències del Mar de Barcelona’s (ICM) protracted experience covers most of the fields of oceanographic research (physical and chemical oceanography, geology and biology) giving it a global vision of marine ecosystems and providing the ability to assess the impact of human activities on the environment and to seek appropriate solutions. The Unitat de Tecnologia Marina (UTM) takes charge of R&D, logistical and technical support for oceanographic research. The UTM is responsible for the technical management of some of Spain’s major oceanographic facilities.

The association of the ICM and the UTM makes the CMIMA one of the leading marine research centres in Spain and in the Mediterranean region. CMIMA researchers take part in international oceanographic projects and surveys in nearly all the world’s seas and oceans.

The Mediterranean Institute for Advanced Studies (IMEDEA) is a joint research centre of the Consejo Superior de Investigaciones Científicas (CSIC) and the Universitat de les Illes Balears (UIB). Its objective is to develop high-quality scientific and technical research in the area of natural resources with special emphasis on interdisciplinary research in the Mediterranean area. Its aim is to identify

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68 An update of the study was published in 2010.
69 Geomorphology is the scientific study of landforms and the processes that shape them.
and elucidate the causes, mechanisms and impacts of anthropogenic activities and global change that threaten marine, coastal and insular systems. The institute fosters proactive, integrated and adaptive knowledge in support of the prevention and mitigation of these impacts. In this context, four departments have been established: (1) biodiversity and conservation (2) ecology and marine resources, (3) global change research and (4) marine technologies, operational oceanography and sustainability.

If MSP would be set up in the Alboran Sea, the Institute of Oceanography, the other Spanish research institutes and the regional government of Andalucia (environmental department – EGMASA) could act as providers of scientific knowledge. The maps of professor Suarez de Vivero can be used to provide an overview of the different sea uses and to assess which areas are suitable for which activities.

In Morocco the INRH is the institute responsible for research related to fish. It provides data and knowledge to the government that uses this information for decision making. For instance, the institute produces statistics of the fish catches and creates forecasting models. Also the different branches of the Abdelmalek Essaadi University, located in the northern part of Morocco, are involved in studying the Alboran Sea with topics such as geology and pollution. The university and INRH cooperate, and international collaboration takes place as well (e.g. with university of Cadiz and EU programmes).

According to Moroccan stakeholders there is a lack of a good vision on what to work on in terms of marine research. Although the research infrastructure is present, considerable work needs to be done in terms of knowledge creation and agenda setting, requiring an overall vision and coordination.

In Algeria the main research institution related to the sea is Ecole Nationale Supérieure des Sciences de la Mer et de l’Aménagement du Littoral (ENNSMAL, marine science and coastal planning). Main research topics are: fisheries and aquaculture, morphodynamics\(^{70}\) and coastal management, hydrogeology\(^{71}\) and pollution and benthic ecosystems.

Its research themes are:
- Develop knowledge of marine and coastal biodiversity;
- Management and rational exploitation of aquatic resources;
- Conservation and monitoring of the marine and coastal environment;
- Factors of evolution of the marine environment;

\(^{70}\) Morphodynamics: study of the interaction and adjustment of the seafloor topography and fluid hydrodynamic processes, seafloor morphologies and sequences of change dynamics involving the motion of sediment. Hydrodynamic processes include those of waves, tides and wind-induced currents.

\(^{71}\) The area of geology that deals with the distribution and movement of groundwater in the soil and rocks of the Earth's crust.
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- Physical-chemical characteristics and environmental quality;
- Coastal and underwater morphodynamics:
  - Information system;
  - Institutional and regulatory mechanisms regarding the occupation of the coast and the exploitation of living and non-living resources.

The Algerian National Observatory for the Environment and Sustainable Development (ONEDD) is responsible for managing networks for observation and measuring pollution, including water pollution. The National Office for the Coast (CNL) is involved in the preservation of protected areas. On the regional level, the Directorates of the Environment are active, which are attached to ONEDD. Their goal is to manage the environment regionally e.g. by monitoring the quality of the environment and managing the monitoring network of bathing waters.

Other institutes/universities with relevance for the Alboran Sea are Institut Supérieur Maritime (ISM), Université des Sciences et de la Technologie Houari Boumediene (USTHB), Réseau de Surveillance Environnementale (LRSE) and Centre National d’études et de Documentation pour la Pêche et l’Aquaculture (CNDPA).

III.6. COHERENCE BETWEEN TERRESTRIAL AND MARITIME SPATIAL PLANNING

Maritime Spatial Planning is considered to benefit from a coherent development with terrestrial spatial planning (MSP key principle 9)

Since part of the environmental impact on the Alboran Sea stems from coastal activities (i.e. urbanisation, coastal tourism, industry and agriculture), it is important that the goals of a maritime spatial plan are in line with the goals of terrestrial plans (ICZM). For example, when an MPA is established, it is important that the flora and fauna of this MPA are not affected by chemical discharges from agricultural activities located nearby the MPA.

In 2007, Spain developed a draft national ICZM strategy ‘Estrategia para la Sostenibilidad de la Costa’. In the ICZM strategy however, no explicit reference was made to the management of the Spanish territorial waters. The strategy is currently being developed through specific memoranda of understanding (MoUs) between the Ministry for the Environment and Rural and Marine Affairs and the Regional Governments. The current legal basis for coastal management is the ‘Shores Act’.

Spain has ratified the ICZM protocol of the Barcelona Convention and Morocco and Algeria are Contracting Parties to the Barcelona Convention. If the ICZM protocol enters into force, it will provide the legal basis for coastal planning, including the territorial sea. The integrated, holistic approach to coastal management will theoretically improve the opportunities for coherence with
Maritime Spatial Planning, but, since no specific ICZM strategies or MSP strategies have been approved (or developed) yet, no analysis can be made of the expected coherence between ICZM and MSP.

### III.7. BENEFITS OF MSP IN THE ALBORAN SEA

MSP has both economic and environmental benefits. In this paragraph the benefits of the application of MSP in the Alboran Sea are discussed.

**Economic effects**

*Figure 20* provides an overview of the possible economic effects of MSP. The effective implementation of MSP in the Alboran Sea will lead to enhanced coordination with benefits for governments and private organisations in terms of lower administrative costs as a result of more efficient procedures. The implementation of MSP will also lead to lower search costs for companies. In addition, investments may be accelerated as a result of more efficient procedures or lower search costs. Moreover, MSP can contribute to the reduction of conflicts of interest.

*Figure 20: Economic effects of Maritime Spatial Planning*

<table>
<thead>
<tr>
<th>Economic effect</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lower / higher coordination costs for government</td>
<td></td>
</tr>
<tr>
<td>2. Lower transaction costs for companies</td>
<td></td>
</tr>
<tr>
<td>a. Lower search costs</td>
<td></td>
</tr>
<tr>
<td>b. Lower legal costs</td>
<td></td>
</tr>
<tr>
<td>c. Lower administrative costs</td>
<td></td>
</tr>
<tr>
<td>d. Less conflicts of interest</td>
<td></td>
</tr>
<tr>
<td>3. Better investment climate</td>
<td></td>
</tr>
<tr>
<td>a. Acceleration of investments</td>
<td></td>
</tr>
<tr>
<td>b. More investments</td>
<td></td>
</tr>
</tbody>
</table>

*Source: DG Mare, 2010, Study on the economic effects of Maritime Spatial Planning*

72 In addition, the Spanish regions of Catalonia and Andalusia have developed regional integrated plans to manage their coastal zone, but also in these plans, no explicit reference is made to the Spanish territorial waters.
Quantification of the effects in the countries surrounding the Alboran 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). Because of this, the benefits of MSP will be discussed in a qualitative way.

None of the countries in the Alboran Sea has developed MSP so far. If the key principles of MSP would be effectively implemented, enhanced coordination mechanisms would be introduced for MSP-issues, leading to e.g. less administrative costs for authorities (local, regional and national). Especially in the case of Morocco and Algeria, significant potential benefits of MSP are available in case coordination is improved. Changes in the legal and institutional framework will first require investments in these countries, but the benefits are likely to be significant. In the longer term the benefits will only rise: competition between activities will increase, requiring an even stronger coordination between the authorities involved. The costs of changes will differ among countries, depending on the current state of the institutional and legal framework.

Integrated management of the sea will also be beneficial for companies that are engaged in maritime activities. Currently, 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. Accelerated investments result in economic effects, since the value of money today is worth more than the same amount next year. Another benefit is the reduction of search costs. One of the objectives of MSP is to increase the knowledge base of the sea. This knowledge will, for example, provide the government the basis for the designation of specific maritime activities (e.g. mariculture, sand extraction) to certain zones, lowering the search costs for companies. An example of the integration of knowledge is the development of maps - by Professor Suarez de Vivero of the University of Seville - including information on the different maritime activities in the Alboran Sea and the characteristics of this sea.

In addition to these benefits, MSP is useful by providing tools to decrease or prevent competition between maritime activities, which would reduce the cost of competition. Examples of (potential) competing activities in the Alboran Sea are competition between coastal and marine tourism and mariculture and competition between fisheries and offshore wind farms.

**Environmental benefits**

MSP includes applying the overarching principle of the ecosystem approach, expressing the need for sustainable development of maritime activities. The sustainability of certain activities in the Alboran Sea and the Strait of Gibraltar could be improved. For instance, the current level of fishing activity is

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73 As mentioned before, quantification is not possible. However, uncoordinated decision-making is often mentioned as a disadvantage. Solving this problem will decrease costs (economic benefit).
likely to lead to a continuous decline in fish stocks. If the implementation of MSP will lead to a sustainable way of performing these activities, the environmental value of the area will increase. For certain activities this may also lead to economic benefits in the long term. For example, sustainable fishing can eventually lead to healthy fish stocks, leading to long-term viability of the fishing sector. Also coastal and marine tourism will benefit from clean water and healthy flora and fauna. MSP can contribute to these benefits by, for example, providing the tools to select and establish MPAs. In the Strait of Gibraltar, MSP can be useful by mitigating the effects of maritime traffic on the marine environment.
IV. CONCLUSIONS AND RECOMMENDATIONS

IV.1. CONCLUSIONS

The Alboran Sea is of 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, fish and other animals living in the sea. The characteristics of the Alboran Sea reinforce the ecological importance of the sea by providing food and shelter for animals. In some areas of the Alboran Sea, maritime activities are dense and compete with each other. Also certain areas experience ‘competition’ between maritime activities and the marine environment.

Need for MSP

The sustainability of maritime activities is key given the environmental importance of the Alboran Sea. The application of the ecosystem based approach and the key principles of MSP will increase the opportunities to enable the sustainable growth of maritime activities. In the Alboran Sea two areas have been identified that have specific potential for the application of MSP: the Strait of Gibraltar and the coastal waters of Andalucia.

The relatively narrow Strait of Gibraltar is one of the most frequently used sea routes in the world. In the Bay of Algeciras the heavy traffic regularly leads to accidents. In the Strait itself a Traffic Separation Scheme is present, limiting the available space for fisheries. The new port Tanger-Med increases the maritime transport activities in and around the Strait. The maritime traffic impacts the marine environment by noise pollution, oil spills, waste discharges and ballast water.

The need for MSP in the coastal waters of Andalucia is also present. Coastal and marine tourism is an important economic activity, as well as fishing. Maritime transport (including ferries and cruise vessels) near ports lead to significant traffic in the region. Moreover, seismic research and sand extraction occasionally take place in certain parts of the coastal waters. A plan for offshore wind farms in the Alboran Sea has also been developed.
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Feasibility

The potential for MSP application is not only determined by the need for MSP, but also by its feasibility. Several MSP key principles are related to this feasibility. These (in some cases combined) principles have been discussed in Chapter III: stakeholder involvement, institutional and legal framework, cross-border/international cooperation, data collection, monitoring and evaluation and coherence between ICZM and MSP.

Stakeholder involvement

In Algeria, Morocco and Spain, sectoral approaches exist towards maritime issues. In Spain, these issues will be coordinated by the Ministry of Environment and Rural and Marine Affairs if the draft law on protection of the marine environment will be implemented. Using a separate coordinating body is the best way to manage stakeholder involvement.

None of the countries has yet developed an integrated plan for the spatial planning of the sea. As a result, no formal procedures for the involvement of stakeholders have been developed. In order to develop a Maritime Spatial Plan with broad support from stakeholders, these stakeholders should be involved in an early phase. On the one hand, their involvement can lead to a better understanding of the reasons for MSP, which may increase the acceptance. On the other hand, they may contribute by providing useful information with regard to competing activities and possible solutions.

The draft law for the protection of the marine environment in Spain mentions that public consultation will be applied before the law is introduced. This indicates that Spain is aware of the need for public consultation with regard to such matters. Moreover, an Interministerial Commission for Marine Strategies will be established, ensuring coordination and cooperation between different ministries.

Institutional and legal framework

With regard to national public authorities in Spain, the Spanish Ministry of Environment and Rural and Marine Affairs will always be involved in maritime affairs. In addition, depending on the type of activity, various other ministries are responsible for maritime issues. Besides the national authorities, the autonomous communities are also involved, since they have responsibility for several maritime activities. For the development of Maritime Spatial Plans however, they will only have an advisory role. The division of responsibilities can hinder the efficiency and effectiveness of the government, but it ensures stakeholder involvement.

With regard to maritime issues in Morocco and Algeria, sectoral approaches dominate, decisions are taken at the national level and no legal framework for MSP is available.

At this stage, the conclusion can be drawn that Spain is more advanced with regard to the institutional arrangements and the creation of a legal base to apply MSP.
Conclusions and recommendations

Cross-border/international cooperation
In collaboration with IUCN, Algeria, Spain and Morocco cooperate to protect the environment of the Alboran Sea. This initiative shows that a first step has been taken to coordinate the activities in the Alboran Sea to improve its state. Nevertheless, political tensions, including the relation 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 MSP will involve multiple states, requiring coordination and cooperation.

Data collection, knowledge creation and evaluation
Marine research institutes are present in all three countries. This provides a good basis for the data and knowledge aspect of MSP. The knowledge base in Spain is strong. However, according to the Institute of Oceanography, research in the Alboran Sea has been lagging behind compared to other parts of Spain. Therefore, more studies in the Alboran 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.

Coherence between terrestrial planning and MSP
The relation between terrestrial planning and maritime planning is strong in the Alboran 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 and MSP strategies in the Alboran Sea increases the likelihood of planning issues given the increasing activities taking place in the coastal areas, both onshore and offshore.

In Table 5 an overview is given of the outcomes for the ‘effect principles’74.

74 Term used in DG Mare, 2010, Study on the economic effects of MSP. Effect principles are those MSP key principles that are related to expected effects of the application of MSP.
### Table 5: Summary status MSP ‘effect principles’ in the Alboran Sea

<table>
<thead>
<tr>
<th></th>
<th>Spain</th>
<th>Morocco</th>
<th>Algeria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Simplified decision-making process</strong></td>
<td>Currently, fragmentation of competences between autonomous regions and national level; Ministry of Environment and Rural and Marine Affairs has a coordinating role</td>
<td>Decision-making takes place at national level with a sectoral approach</td>
<td>Decision-making takes place at national level with a sectoral approach</td>
</tr>
<tr>
<td><strong>Establishment of a legal framework</strong></td>
<td>ICZM strategy has been developed, but not adopted; Most important law related to MSP will be the law on ‘marine environment protection’</td>
<td>No legal framework for MSP, nor any spatial planning or coastal law that can be applied to the sea</td>
<td>No legal framework for MSP, nor any spatial planning or coastal law that can be applied to the sea</td>
</tr>
<tr>
<td><strong>Cross-border (international) cooperation</strong></td>
<td>Cross-border/international cooperation between Spain and Morocco is established. The collaboration for the protection of the Alboran Sea increases cross-border/international cooperation between the three countries</td>
<td>An MSP strategy or ICZM strategy has not been developed yet</td>
<td>An MSP strategy or ICZM strategy has not been developed yet</td>
</tr>
<tr>
<td><strong>Coherence with other planning systems</strong></td>
<td>The ICZM strategy has not (yet) been adopted. Moreover, different responsibilities for regional and national authorities hinder coherence; the ‘marine environment protection’ law will aim for coherence with ICZM</td>
<td>An MSP strategy or ICZM strategy has not been developed yet</td>
<td>An MSP strategy or ICZM strategy has not been developed yet</td>
</tr>
</tbody>
</table>

Source: Policy Research Corporation

### IV.2. RECOMMENDATIONS

In order to implement MSP in the Alboran Sea, it is recommended that the parties involved work according to the ten MSP key principles. Especially for the Strait of Gibraltar, the principle of cross-border/international cooperation is important since three states are involved (Spain, UK (Gibraltar) and Morocco), while relations are not optimal. A solution for the oil spill and collision problem could be to establish zones for bunkering at sea and use an independent management body for control (management of the (high) seas). In that way control will not be bound to a national territory. For the coastal waters of Andalucia, national coordination will be very important due to the involvement of different levels of authority. A solution to mitigate the impact of maritime activities on the marine environment is to establish a coherent network of marine protected areas. In the following paragraphs these recommendations are explained in detail. In addition, the section on recommendations in the final report provides more extensive (general) recommendations useful for the Alboran Sea. Also the
Conclusions and recommendations

best practices in the final report may provide useful examples for setting up or implementing certain aspects of MSP.

Stakeholder involvement
For the acceptance of and input for MSP, stakeholder involvement is key. It is important to convince stakeholders (e.g. government, industries, research institutes) in an early stage of the need for the sustainable development of the sea and the role MSP 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 MSP.

Institutional and legal framework
Maritime-related policies are currently being developed in Morocco and Algeria according to a sectoral 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, integrated MSP. In this respect, it is recommended to establish a coordinating body or an inter-ministerial committee both at the national level and at the regional level.

Data collection, knowledge creation and evaluation
For the collection of data and the creation of knowledge about the Alboran Sea, national and international cooperation between the organisations involved in marine research is important. Although (international) cooperation already takes place, significant improvements can be made. 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 Alboran Sea may provide the framework for coordination and cooperation. This initiative may be formed under the umbrella of the collaboration between the three countries for the protection of the Alboran Sea.

According to the Spanish Institute for Oceanography, data and knowledge of the Alboran Sea needs to be extended to provide a thorough knowledge base for the establishment of a Maritime Spatial Plan in the Spanish part of the Alboran Sea. Especially for areas further offshore, a lack of knowledge exists. For Morocco and Algeria similar conclusions can be drawn. Therefore an assessment should be made of the most important research topics for the territorial seas and high seas. Since the basis of MSP consists of a thorough understanding of the state of the sea, sufficient resources need to be available to carry out the necessary research; this does not necessarily imply that additional resources are
required, since an important step could already be made through, for example, increased research efficiency as a result of an agreement on a common research agenda. Without sufficient resources, the application of MSP will not be effective and therefore additional resources may need to be invested.

**Coherence with terrestrial planning**

In general, spatial planning of the coast 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. Although this may be the case, the development of MSP is preferably developed simultaneously with ICZM to achieve coherence, or shortly after ICZM development.

**Monitoring and control**

If a Maritime Spatial Plan is developed, the surveillance of the area needs to be effective. Improvements in surveillance are highly recommended in this respect. For instance, vessel tracking monitoring systems can be implemented. For the detection of oil spills, the CleanSeaNet tool can be used. It provides a near-real-time satellite-based oil spill and vessel monitoring service. The use of cameras can be useful as well (e.g. for control in protected areas). Moreover, cross-sectoral national cooperation should be considered to integrate monitoring and control activities.

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 the purpose of control. In this respect the Bluemassmed programme for the Mediterranean Sea is a promising development. Since the Strait of Gibraltar is an international strait, the adjacent countries have to provide ‘transit passage’ to merchant ships. As a result opportunities for surveillance of merchant ships are limited. 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. Specifically in the Bay of Algeciras, special zones for bunkering could be established in order to resolve the problem of collisions and oil spills. These zones could be monitored and controlled by an independent management body.

For management and control of (part of) the high seas, countries have the option to cooperate internationally through international conventions/treaties or through establishing maritime zones. It is recommended to first look into the possibilities for cooperation within the framework of the Barcelona Convention or other (regional) initiatives. The establishment of a specific MSP protocol for the Barcelona Convention could be a 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. If a country establishes such a zone it has the right and duty to manage and control the area to a certain extent, depending on the type of zone. An EEZ is the only type of zone that provides a basis for the cross-sectoral application of MSP on the high seas.
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 Alboran Sea the establishment of zones is a difficult issue, because of disagreement about the maritime border between Spain and UK, and Spain and Morocco. In this respect, some form of agreement about maritime borders is an important step to divert attention to the application of cross-border/international cooperation on sea and should therefore be a priority in this area.
### Annexes

### ANNEX I: ABBREVIATIONS

#### General abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>CAMP</td>
<td>Coastal Area Management Programme</td>
</tr>
<tr>
<td>EEZ</td>
<td>Exclusive Economic Zone</td>
</tr>
<tr>
<td>EFPZ</td>
<td>Ecological and Fishery Protection Zone</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>EPZ</td>
<td>Ecological Protection Zone</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FAO</td>
<td>Fisheries and Agriculture Organisation</td>
</tr>
<tr>
<td>GT</td>
<td>Gross tonnage</td>
</tr>
<tr>
<td>IBA</td>
<td>Important Bird Area</td>
</tr>
<tr>
<td>IMO</td>
<td>International Maritime Organisation</td>
</tr>
<tr>
<td>LNG</td>
<td>Liquefied Natural Gas</td>
</tr>
<tr>
<td>MEDPAN</td>
<td>Mediterranean Protected Areas Network</td>
</tr>
<tr>
<td>MPA</td>
<td>Marine Protected Area</td>
</tr>
<tr>
<td>MSP</td>
<td>Maritime Spatial Planning</td>
</tr>
<tr>
<td>n/a</td>
<td>Not applicable</td>
</tr>
<tr>
<td>NATO</td>
<td>North Atlantic Treaty Organization</td>
</tr>
<tr>
<td>Nm</td>
<td>Nautical mile</td>
</tr>
<tr>
<td>SPAMI</td>
<td>Specially Protected Areas of Mediterranean Interest</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
</tr>
<tr>
<td>WWF</td>
<td>World Wide Fund for Nature</td>
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</table>

#### Specific abbreviations

<table>
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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>CNDPA</td>
<td>Centre National d’Etudes et de Documentation pour la Pêche et l’Aquaculture</td>
</tr>
<tr>
<td>CNL</td>
<td>National Office for the Coast</td>
</tr>
<tr>
<td>CSIC</td>
<td>Consejo Superior de Investigaciones Científicas</td>
</tr>
<tr>
<td>DWT</td>
<td>Deadweight Tonnage</td>
</tr>
<tr>
<td>EGMASA</td>
<td>Empresa de Gestión Medioambiental (Environmental Department)</td>
</tr>
<tr>
<td>ENNSMAL</td>
<td>École Nationale Supérieure des Sciences de la Mer et de l’Aménagement du Littoral</td>
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</table>
**Exploring the potential of maritime spatial planning in the Mediterranean**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>EUCC</td>
<td>European Coastal and Marine Union</td>
</tr>
<tr>
<td>CMIMA</td>
<td>Centre Mediterrani d’Investigacions Marines i Ambientals</td>
</tr>
<tr>
<td>GFCM</td>
<td>General Fisheries Commission for the Mediterranean</td>
</tr>
<tr>
<td>ICCAT</td>
<td>International Commission for the Conservation of Atlantic Tunas</td>
</tr>
<tr>
<td>ICM</td>
<td>Institut de Ciències del Mar</td>
</tr>
<tr>
<td>ICZM</td>
<td>Integrated Coastal Zone Management</td>
</tr>
<tr>
<td>IMEDEA</td>
<td>Mediterranean Institute for Advanced Studies</td>
</tr>
<tr>
<td>INRH</td>
<td>Institut National de Recherche Halieutique</td>
</tr>
<tr>
<td>ISM</td>
<td>Institut Supérieur Maritime</td>
</tr>
<tr>
<td>IUCN</td>
<td>International Union for Conservation of Nature</td>
</tr>
<tr>
<td>JNCC</td>
<td>Joint Nature Conservation Committee</td>
</tr>
<tr>
<td>LRSE</td>
<td>Laboratoire de Recherche Réseau de Surveillance Environnementale</td>
</tr>
<tr>
<td>MMO</td>
<td>Marine Mammal Observer</td>
</tr>
<tr>
<td>NHRI</td>
<td>National Fisheries Research Institute</td>
</tr>
<tr>
<td>OFCF</td>
<td>Overseas Fishery Cooperation Foundation</td>
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<tr>
<td>ONEDD</td>
<td>(Algerian) National Observatory for the Environment and Sustainable Development</td>
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<tr>
<td>SAC</td>
<td>Special Area for Conservation</td>
</tr>
<tr>
<td>SDAL</td>
<td>Schéma Directeur d’Aménagement du Littoral</td>
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<tr>
<td>SDAUL</td>
<td>Master plan for the development of Urban Coastal Areas</td>
</tr>
<tr>
<td>SDAULT</td>
<td>Master plan for the development of Touristic Coastal Areas</td>
</tr>
<tr>
<td>SMAP</td>
<td>Short and Medium Term Priority Environmental Action Programme</td>
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<tr>
<td>SNAT</td>
<td>Schéma National d’Aménagement du Territoire</td>
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<tr>
<td>SPA</td>
<td>Special Protection Area</td>
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<tr>
<td>SRAT</td>
<td>Schémas Régionaux d’Aménagement et de Développement du Territoire</td>
</tr>
<tr>
<td>UIB</td>
<td>Universitat de les Illes Balears</td>
</tr>
<tr>
<td>USTHB</td>
<td>Université des Sciences et de la Technologie Houari Boumediène</td>
</tr>
<tr>
<td>UTM</td>
<td>Unitat de Tecnologia Marina</td>
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## ANNEX II: LIST OF CONTACT PERSONS

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<thead>
<tr>
<th>Country</th>
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<tr>
<td>Algeria</td>
<td>Nadia Chenouf</td>
<td>Ministère de l'Aménagement du Territoire, de l'Environnement et du Tourisme</td>
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<tr>
<td>Algeria</td>
<td>Samir Grimes</td>
<td>Institut des Sciences de la Mer et de l'Aménagement du Littoral</td>
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<td>Algeria</td>
<td>Samira Nateche</td>
<td>Ministère de l'Aménagement du Territoire, de l'Environnement et du Tourisme</td>
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<tr>
<td>Algeria</td>
<td>Farid Nezzar</td>
<td>MAP Focal Point</td>
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<tr>
<td>Morocco</td>
<td>Abdelkarim El Arrim</td>
<td>Abdelmalek ESSAADI University (marine sciences)</td>
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<td>Bouchta El Moumni</td>
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<td>Driss Nachite</td>
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<td>MAP focal point</td>
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<td>Fikrat Abdelouahed</td>
<td>Ministère de l'Habitat, de l'Urbanisme et du Développement de l'Espace</td>
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<tr>
<td>Morocco</td>
<td>Larbi Sbai</td>
<td>Conseiller du secrétaire d’état du Département de Pêche</td>
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<tr>
<td>Morocco</td>
<td>Maria Snoussi</td>
<td>Université Mohamed V – Agdal, Faculté des Sciences</td>
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<tr>
<td>Morocco</td>
<td>M'Hammed El Idriissi</td>
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<tr>
<td>Morocco</td>
<td>Sarra Sefrioui</td>
<td>PHD student in international relations (law and maritime law)</td>
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<td>Taoufiq Boudchiche</td>
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<td>Ministère de l'Agriculture et de la Pêche Maritime</td>
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<td>Ana Pello Rodriguez</td>
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<td>Spain</td>
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