Technical Report

Current Conditions and Compatibility of Maritime Uses in the Western Mediterranean

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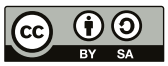

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Acknowledgement

The MSPglobal Initiative would like to acknowledge the support received by local, national and regional stakeholders who took part in MSPglobal engagement activities, therefore contributing to the knowledge summarised in this publication.

Special acknowledgement extends to National Focal Points and partner institutions representing the Governments of Algeria, France, Italy, Libya, Malta, Mauritania, Morocco, Portugal, Spain and Tunisia, the European Commission, the Union for the Mediterranean, the Steering Group of the WestMED Initiative and the Priority Action Programme – Regional Activity Centre of the Mediterranean Action Plan.

MSPglobal Initiative

The project "Supporting internationally accepted maritime spatial planning guidance" – **MSPglobal** for short – is an initiative by UNESCO's Intergovernmental Oceanographic Commission (IOC-UNESCO) and the European Commission's Directorate-General for Maritime Affairs and Fisheries (DG MARE) to support their Joint Roadmap to Accelerate Maritime/Marine Spatial Planning processes worldwide (**MSProadmap**) (#OceanAction15346).

Launched in November 2018 for a period of three years, MSPglobal aims to support international maritime/marine spatial planning (MSP) for the sustainable development of the blue economy, by enhancing cross-border and transboundary cooperation where it already exists and promoting MSP processes in areas where it is yet to be put in place.

More specifically, it seeks to:

- Develop a **guidance** on cross-border and transboundary MSP;
- **Increase awareness** among governmental authorities and stakeholders about the importance of MSP;
- Initiate an **institutional coordinate dialogue** between governmental authorities at regional, national and local levels; and
- Increase **cooperation between stakeholders**.

By providing the context for active and effective participation of policy-makers, scientists, businesses, citizens and other stakeholders, MSPglobal aims to improve governance at multiple levels and achieve an ecosystem-based approach in support of the blue economy. Doing so will require transparent data and information, sharing of best practices and new knowledge to inform, guide and support MSP at global scale.

Two pilot projects, one in the Western Mediterranean and another in the Southeast Pacific, will facilitate concrete transboundary and cross-border activities, respectively, at different geographical levels as well as support the participating countries in successfully implementing MSP initiatives.

The MSPglobal Initiative is divided into five work packages (WP):

WP1: Joint EC/IOC Guidance on cross-border / transboundary MSP

WP2: Pilot project in the Western Mediterranean Sea basin

WP3: Pilot project in the Southeast Pacific region (with mapping exercise in the Historical Bay – Gulf of Guayaquil)

WP4: Participation, communication and dissemination

WP5: Project management

I. WP2: Pilot project in the Western Mediterranean Sea basin

The WP2 will be implemented in seven Western Mediterranean countries: Algeria, France, Italy, Malta, Morocco, Spain and Tunisia; other countries of the Union for the Mediterranean could also be invited to participate. The activities of this work package are in line with and contribute to existing national MSP processes, as well as potential transboundary MSP processes in the region. It has five specific objectives, which are described below:

1. Increase awareness among decision-makers and elected officials concerning the importance of MSP in the context of sustainable blue economy in order to foster dialogue and cooperation on cross-border MSP to enable blue growth in the Western Mediterranean Sea basin;
2. Wherever possible under existing mechanisms, initiate an institutional coordination dialogue between the various authorities at the national, regional and local levels building on the results of EU transboundary projects;
3. Build on work being done by the SIMWESTMED MSP project at EU level to increase cooperation with non-EU Member States on MSP (and other on-going initiatives) by **developing an MSP preplanning phase in the Western Mediterranean region**;
4. **Explore the links between MSP and Integrated Coastal Zone Management (ICZM)** and contribute to a better understanding of similarities and differences between the two concepts;
5. Formulate regional recommendations in line with the Initiative for the development of the blue economy in the Western Mediterranean (WestMED Initiative) and its Framework for Action, explore political will, and wherever possible establish the first steps leading to the **adoption of a roadmap on MSP and sustainable blue economy in the sea basin**.

This *Technical Report on Current Conditions and Compatibility of Maritime Uses in the Western Mediterranean* is related to the specific objective 3, and aims to support the discussions and development of the preplanning phase of a regional transboundary MSP in the Western Mediterranean Sea basin.

II. The Western Mediterranean context

II.1. Introduction to the West Mediterranean pilot project area

II.1.1. Preliminary considerations

Following a regional and integrated approach, this report will assess the current conditions and compatibilities of maritime uses and future scenarios for maritime/marine spatial planning and blue growth in the context of the Western Mediterranean Sea basin. It is worth noting that this report does not intend to build a marine spatial plan but rather provide tools, products and recommendations.

Similarly, the purpose of this report is not to make any legal statement, either from any country or from the IOC-UNESCO regarding administrative boundaries or any other legal issues related to each country's competency. Therefore, the countries' exclusive economic zone delimitation was omitted in order to keep the regional approach.

II.1.2. Definition and main characteristics of the pilot project area

The **MSPglobal West Mediterranean pilot project** area is bordered by seven countries: Algeria, France, Italy, Malta, Morocco, Spain and Tunisia. It covers the Western Mediterranean Sea basin stretching east from the limit of the economic exclusive zone (EEZ) of Italy, Malta and Tunisia to the Strait of Gibraltar in the West (Figure 1).

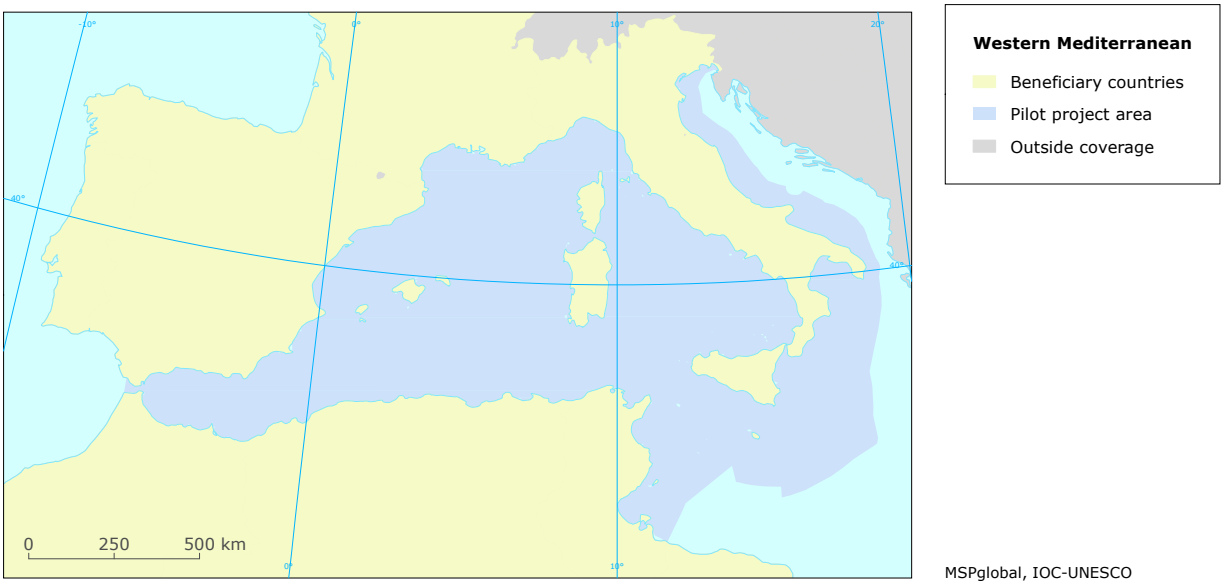


Figure 1
The West Mediterranean pilot project area.
(Data source: IOC-UNESCO).

The case study's boundaries were defined taking into consideration the regional character of the initiative. Although there are seven different countries involved in the pilot project, the marine area is considered as a whole to facilitate the regional approach. According to (Nylén *et al.,* 2019), if no precise area is dictated, it is preferable to identify borders that conform to established administrative borders. Therefore, considering the focus area (Western Mediterranean) and the countries involved, already defined administrative boundaries were used to draw the pilot project area.

The western limit was defined considering administrative areas established by Spain in the framework of its transposition of the Marine Strategy Framework Directive (MSFD). The limit of the Strait of Gibraltar and the Alboran Sea (*Ley 41/2010, de 29 de diciembre de protección del medio marino*) in its western side was projected across the strait until the coast of Morocco. On the other hand, its eastern limit was drawn following the approximate EEZs of Italy, Malta and Tunisia as represented in the dataset of Maritime Boundaries version 10 of marineregions.org. Regarding the definition of the inland boundary, past regional initiatives were consulted (e.g. SIMWESTMED). How far inland the marine spatial planning analysis goes is always complex to determine, however, it mainly depends on the context, the scale and the desired outputs.

The sea basin encompasses diverse coastal and marine ecosystems that support the biodiversity and provide numerous good and services to the coastal communities, including coastal plains, wetlands, brackish water lagoons, estuaries or transitional areas, seagrass meadows, coralligenous communities and mäerl beds, frontal systems and upwelling, seamounts and pelagic systems (Plan Bleu, 2014). By hosting 87% of the Mediterranean's well-documented forms of life, the Western part of the Mediterranean Sea basin presents the highest rates of endemism (UNEP/MAP - CP/RAC, 2013). However, today the Western Mediterranean, as well as the whole sea basin, are under intense pressures deriving from increasing coastal urban development and intensive human activities such as fisheries, extraction of natural resources, maritime traffic and pollution (Plan Bleu, 2014).

II.2. Governing maritime policies and legislation in the Western Mediterranean

The sustainable development in the Mediterranean is crucial to address environmental, social and economic challenges in the region. To allow for its effective implementation, countries around the Mediterranean have adopted policies and regulatory instruments and measures at national and regional levels. At the international level, the United Nations Convention on the Law of the Sea (UNCLOS) remains the main international legal basis for regulating marine ecosystems and the blue economy/blue growth, in addition to other multilateral environmental agreements ratified by countries as legislative support for sustainable development. Finally, the Sustainable Development Goals

(SDGs), particularly the SDG 14, are the cornerstone of global, regional and sub-regional policies for the establishment of a sustainable green and blue growth. Nevertheless, a clear divide exists in terms of sustainable development and ecological transition between the opposite shores of the Mediterranean Sea basin.

II.2.1. International maritime policies and legislation

The United Nations Convention on the Law of the Sea provides the overarching legal framework for the governance of the ocean and seas, including the implementation of marine spatial planning. The convention defines five main marine areas under national jurisdiction, namely the internal waters (IW), territorial sea (TS), contiguous zone (CZ), exclusive economic zone (EEZ) and continental shelf (CS); as well as areas beyond national jurisdiction. Alongside the mentioned basic concepts, the Mediterranean states have proclaimed other jurisdictional forms that were not envisaged by the convention: fishery protection zones (FPZ), ecological protection zones (EPZ) and a combination of the latter two: the ecological and fisheries protection zone (EFPZ) (De Vivero, 2010).

Articles 192, 194 and 197, PART XII of UNCLOS provide a legal framework for all activities in the ocean and seas, including the conservation and sustainable use of marine biodiversity beyond areas of national jurisdiction, and urge co-operation between Parties on a global and regional basis for the formulation and elaboration of the necessary international rules. The convention also provides measures for semi-enclosed seas and calls for the necessity of a multiscale approach to recognise the specificities of the Mediterranean basin and its marine regions from a legal and environmental point of view.

UNCLOS also authorises the introduction of legal and policy tools for coastal planning as long as they do not conflict with its objectives. The law of the sea can thus facilitate the establishment of marine spatial planning in the southern countries of the Western Mediterranean. Indeed, in addition to the EU countries, all North African countries have ratified the convention. It is worth noting that Malta has still not established an EEZ, but has an EFPZ.

II.2.2. Supranational frameworks

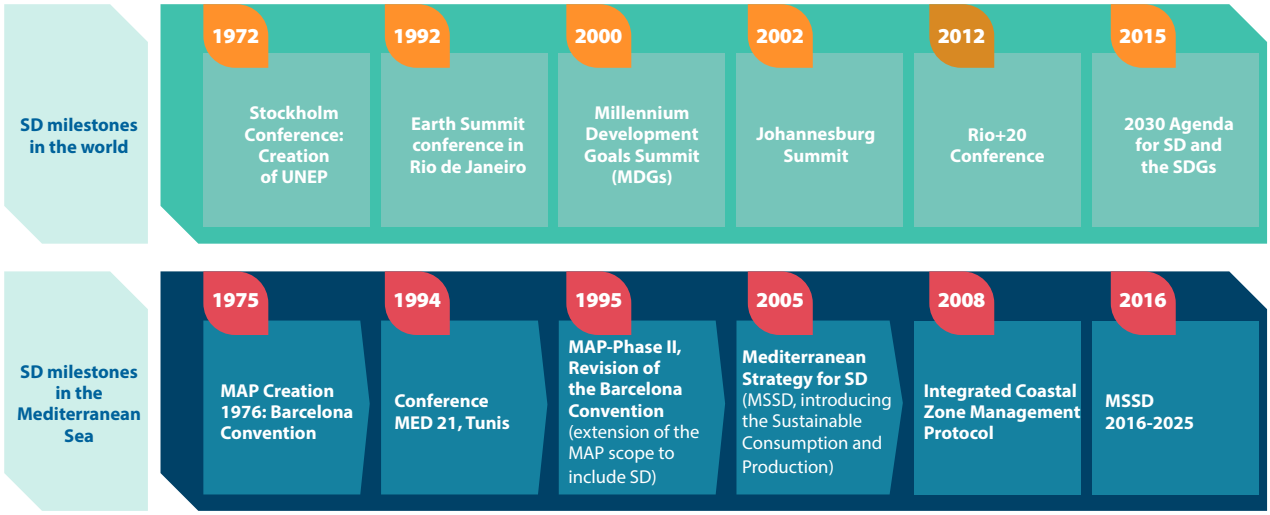
Several supranational policies and legislative instruments establishing a framework for integrated coastal management and supporting the implementation of MSP in the Western Mediterranean exist. Some governance structures were strengthened over the last four decades at the Mediterranean regional level to tackle the regional environmental, social and economic challenges in the Mediterranean.

II.2.2.1. The Mediterranean Action Plan and the Barcelona Convention

The **Mediterranean Action Plan (MAP)** was adopted in 1975 along with the **Barcelona Convention** as its legal framework, with its related seven legal protocols. The implementation of the MAP was established under the **Coastal Area Management Programme (CAMP)** that aims to achieve integrated coastal zone management through the implementation of practical coastal management projects within the Mediterranean countries part of the Barcelona Convention. Additionally, the CAMP promotes the **Integrated Coastal Zone Management Protocol** as the legal reference instrument for the ICZM implementation in the Mediterranean. Today, the MAP brings together 21 Mediterranean countries and the European Union, all parties to the Barcelona Convention (UNEP/MAP, 2020).

The **Action Plan for the Protection of the Marine Environment and the Sustainable Development of the Coastal Areas of the Mediterranean** (MAP-Phase II) was adopted in 1995, it revised the Barcelona Convention whilst giving a special attention to the conservation and sustainable management of coastal zones and focusing on the incorporation of the environment in the social and economic development of the region.

Both the Barcelona Convention and the Mediterranean Action Plan mandates evolved gradually towards more integrated planning and management of the Mediterranean's environmental issues while remaining consistent with the changes in the international commitments toward sustainable development (Plan Bleu and AFD, 2016) (Figure 2).



SD = Sustainable development; MAP = Mediterranean Action Plan; MDGs = Millennium Development Goals; SDGs = Sustainable Development Goals.

Figure 2
Sustainable development milestones in the world and in the Mediterranean Sea basin.
(Source: Adapted from Plan Bleu/ AFD, 2016).

At the regional level, France, Spain, Italy, Malta, Tunisia, Algeria and Morocco have all signed and ratified the Barcelona Convention. Nevertheless, the Offshore Protocol was neither signed nor ratified by Algeria or France. It was not ratified by Italy, Malta or Spain. The Protocol on Hazardous Wastes was not ratified by Algeria, Italy, or Spain. France and the European Union have neither signed nor ratified this protocol. The Protocol on Prevention and Emergency has not been ratified by Tunisia. The 1996 amendments on the Land-Based Pollution Protocol to the Barcelona Convention were not ratified by Algeria, The ICZM Protocol was neither signed nor ratified by Algeria, Italy, or Tunisia. It is worth mentioning that the Kingdom of Morocco is the only country within the Western Mediterranean countries and the European Union that has signed and ratified the totality of the Barcelona convention and its seven Protocols (Figure 3).

	Barcelona Convention	Dumping Protocol	Prevention and Emergency Protocol		Land-Based Sources Protocol		SPA and Biological Diversity Protocol	Offshore Protocol	Hazardous Wastes Protocol	ICZM Protocol
	1995 Version	1976* Version	1976 Version	2002 Version	1980 Version	1996 Version	1995 Version	1994	1996	2008
Algeria										
France										
Italy										
Malta										
Morocco										
Spain										
Tunisia										
EU										

*	1995 version amended but not enacted
	Ratification, Acceptance, Approval, Accession
	Signature
	Not signed

Figure 3
Status of signatures and ratifications of the Barcelona Convention and its protocols by the Contracting Parties in the Western Mediterranean.
(Source: Adapted from Plan Bleu/ AFD, 2016 and UNEP/MAP, 2020).

II.2.2.2. The Union for the Mediterranean

The Union for the Mediterranean (UfM) is an intergovernmental body established in 2008 to enhance dialogue among the 28 EU Member States and the 15 southern and eastern Mediterranean countries. It aims at promoting regional cooperation among the 43 countries to protect the Mediterranean Sea and its natural resources while supporting partnerships inspired by the 'green/blue' circular economy principles (UfM Secretariat, 2020).

In 2013, the UfM signed a Memorandum of Understanding with the Barcelona Convention acknowledging the need for a transition to a sustainable growth; calling for the promotion of a sustainable blue economy and committing to policy reforms to accelerate the shift towards sustainable patterns in the Mediterranean Sea (Plan Bleu, 2016). In its first Ministerial Conference on Blue Economy in November 2015, ministers of the UfM and country representatives emphasised their will to collaborate in a common aim for a sustainable growth in the Mediterranean region and the potential the Sea basin presents. The conference's declaration laid out the responsibility for promoting such instruments as MSP and ICZM, including the integration of land-sea interactions in the ecosystem approach and the development of a well-managed marine protected areas network (Plan Bleu, 2016).

II.2.2.3. The Ecosystem Approach Initiative

To achieve an ecosystem approach-based management and the good environmental status (GES) of the Mediterranean Sea and coast, the Contracting Parties to the Barcelona Convention adopted in 2008 the MAP's Ecosystem Approach Initiative (EcAp).

To achieve an integrated coastal zone management, Ramieri et al. (2019) stress that the EcAp must go beyond the GES of marine waters and ecosystems to include those of the land portion of the coastal area, while staying in line with the requirements of the ICZM Protocol. In the Mediterranean, the importance of the EcAp lies in the fact that, in the Mediterranean it is considered to be the main framework that guides all policy application and development conducted in compliance with the Barcelona Convention (Plan Bleu, 2016).

II.2.2.4. The Mediterranean Strategy for Sustainable Development

The Mediterranean Strategy for Sustainable Development (MSSD) (2005-2015, renewed for 2016-2025) is a strategic policy framework that aims at safeguarding the sustainable development of the marine and coastal areas in the Mediterranean region by providing technical assistance with the required guidelines and methodologies for the implementation of ICZM in the Mediterranean (Ramieri et al., 2019). The strategy focuses on strengthening the implementation of Barcelona Convention Protocols while establishing regulatory mechanisms, including MSP (Ramieri *et al.*, 2019).

A list of indicators compiled by Plan Bleu shows some results of the MSSD (2005-2015). It highlights a gap between the two Mediterranean shores in terms of sustainable development and ecological footprint. For example, between 1995 and 2009, while the ecological footprint of Morocco, Algeria and Libya worsened, that of the EU countries improved. Furthermore, the share of renewable energy in the countries' energy budget, although it increased between 1998 and 2008, was almost absent in North African countries, while it increased at a faster pace in the European Mediterranean countries.

II.2.2.5. The Western Mediterranean Initiative

The Western Mediterranean Initiative (WestMED) has been established to foster a resilient blue economy and a secure and better-governed Mediterranean Sea by supporting public institutions, researchers, the private sector and local governments and communities in ten Mediterranean countries. The initiative focuses on the ten Western Mediterranean countries of Algeria, France, Italy, Libya, Malta, Mauritania, Morocco, Portugal, Spain and Tunisia, with a scope of action open to partners in the whole Mediterranean region (WestMED, 2020).

It is worth noting that the MSSD and the WestMED initiative are the main projects supporting the sustainable development and development of the blue economy in the Mediterranean region.

II.2.3. Regional Initiatives

Multiple regional initiatives, funded by the European Union, support the establishment of integrated coastal zone management and the implementation of marine spatial planning in the Western Mediterranean and the Mediterranean Sea basin in general.

The most recent initiatives supporting the implementation of MSP in the region are the SIMWESTMED project and the newly funded MSP-MED project. The MSP-MED project, launched in March 2020 and co-funded by the European Maritime and Fisheries Fund of the European Commission will build on the results of completed and ongoing projects addressing MSP in the Sea basin by supporting the establishment of coherent and coordinated national marine spatial plans among the participating countries. Following a pan-Mediterranean approach, the project will implement activities at a sea basin level by supporting the development of relevant cross-border cooperation on MSP with bordering EU and non-EU member states. SIMWESTMED - a two years project co-funded by the Directorate General for Maritime Affairs and Fisheries of the European Commission and completed in 2018- focused on cross-border issues and supported the implementation of MSP in the Western Mediterranean Sea by launching four concrete cross border MSP initiatives between the four participating Member States (Table 1).

The table below highlights further details on these projects and provide a non-exhaustive list of related initiatives.

Table 1
Regional Initiatives supporting the implementation of ICZM and MSP in the Mediterranean Sea-Basin.

Initiative (Date)	Description / Main objectives	Regional Sea/ Large Marine Ecosystem (LME)	Participating countries	Issues addressed	Source
MSPMED: Towards the operational implementation of MSP in our common Mediterranean Sea	To help the development of MSP in European Union Member States facing the Mediterranean Sea. Project will address specific issues regarding each national MSP, enhancing cooperation among states and knowledge sharing, finally ensuring coherence among plans.	Mediterranean Sea	France, Greece, Italy, Malta, Slovenia, Spain	The establishment of coherent Marine Spatial Plans	MSPMED
Determination of Priority Actions for the Further Elaboration and Implementation of the Strategic Action Programme for the Mediterranean Sea (2000-2006)	A Strategic Action Programme (SAP MED) to address pollution from land-based activities was adopted by the Contracting Parties to the Barcelona Convention in 1997. SAP MAP identifies the major pollution problems of the region, indicates the possible control measures, shows the cost of such measures and establishes a work plan and timetable for their implementation.	Mediterranean Sea	Albania, Algeria, Bosnia and Herzegovina, Croatia, Egypt, Lebanon, Morocco, Slovenia, Syria, Tunisia, Turkey	Pollution	GEF IW: LEARN
MED Integration of Climatic Variability and Change into National Strategies to Implement the ICZM Protocol in the Mediterranean (2012-2013)	Support the implementation of the Barcelona Convention's ICZM Protocol through the development of region-wide coordination mechanisms and tools to address climate variability in the Mediterranean region.	Mediterranean Sea	Albania, Algeria, Bosnia and Herzegovina, Egypt, Lebanon, Libya, Montenegro, Morocco, Syria, Tunisia	ICZM	GEF IW: LEARN
MED Mediterranean Environmental Sustainable Development Program (Sustainable MED) (2009-2014)	N/A	Mediterranean Sea	Albania, Algeria, Bosnia and Herzegovina, Bulgaria, Egypt, Lebanon, Libya, North Macedonia, Montenegro, Morocco, Serbia	N/A	GEF IW: LEARN
MED: Sustainable Governance and Knowledge Generation (2011-2015)	Foster the integration of environmental issues into sectoral and development policies of the Beneficiaries through the production of innovative knowledge on environmental issues, with specific reference to water related topics (freshwater, coastal and marine resources) and the organisation of trainings during which this knowledge will be used to strengthen the capacity of key stakeholders at a local, national and regional level.	Mediterranean Sea	Albania, Algeria, Bosnia and Herzegovina, Egypt, Lebanon, Libya, North Macedonia, Montenegro, Morocco, Syria, Tunisia, Turkey	Capacity building	GEF IW: LEARN

Initiative (Date)	Description / Main objectives	Regional Sea/ Large Marine Ecosystem (LME)	Participating countries	Issues addressed	Source
Oil Pollution Management Project for the Southwest Mediterranean Sea (1994-2000)	Reduce the input of hydrocarbons into the international waters of the Mediterranean, ensure commonality of approach, regulatory policies and methodologies, promote exchange of information and coordination of implementation, utilise national data sets to assess long-term regional trends in marine pollution, both for national coastal waters and for adjacent international waters, enhance the national monitoring capability, and develop a coastal environmental management framework.	Mediterranean Sea (West)	Algeria, Morocco, Tunisia	Pollution, oil and gas	GEF IW: LEARN
MAritime REgions cooperation for the MEDiterranean (MAREMED) (2010-2013)	Develop tools for enhancing and coordinating regional, European and Mediterranean policies on the following six thematic strategies: maritime policy governance, integrated management of coastal and maritime areas, fisheries, adaptation to climate change in coastal areas, efforts to reduce pollution and data management.	Mediterranean Sea	Cyprus, France, Greece, Italy, Spain	Maritime policy governance, fisheries, ICZM, adaptation to climate change in coastal areas, pollution, data management	MAREMED
Supporting Implementation of Maritime Spatial Planning in the Western Mediterranean region project (SIMWESTMED) (2017-2018)	Support the implementation of maritime spatial planning in EU Member States, launch and carry out concrete and cross-border MSP initiatives between Member States. To date, the SIMWESTMED project is the only MSP project in the Western Mediterranean region.	Mediterranean Sea (West)	France, Italy, Malta, Spain	Initial assessment, cooperation on MSP in the Western Mediterranean, MSP process, methodology for a transboundary MSP, spatial demands and future trends, data and information requirements for MSP, tools and methods supporting MSP, stakeholder engagement	European MSP Platform
MArine Protected Areas in the MEDiterranean (MAPAMED)	MAPAMED is a GIS (geographic information system) database that gathers information on marine protected areas (MPAs) in the Mediterranean, and more generally on sites of interest for the conservation of the marine environment. It was developed in order to facilitate the access and the sharing of data on Mediterranean MPAs, allow the analysis and the evaluation of the status and trends of the MPA network and identify ecological and management issues at a supra-MPA scale. The database was developed in 2008 and jointly administered by the MedPAN association and UNEP MAP SPA/RAC.	Mediterranean Sea	All Mediterranean countries	MPA establishment	The MedPAN assoication
MedPAN South Project (2009-2012)	Enhance and consolidate capacity in the countries of the south and east of the Mediterranean to establish new MPAs, better manage the existing ones and strengthen the MedPAN network of MPA managers.	Mediterranean Sea (South and East)	Albania, Algeria, Croatia, Egypt, Lebanon, Libya, Montenegro, Morocco, Syria, Tunisia, Turkey	MPA establishment, improving the management of existing MPAs	IW: LEARN
People for Ecosystem Based Governance in Assessing Sustainable Development of Ocean and Coast (PEGASO) project (2010- 2014)	Build on existing capacities and develop common novel approaches to support integrated policies for the coastal, marine and maritime realms of the Mediterranean and Black Sea basins in ways that are consistent with and relevant to the implementation of the ICZM Protocol for the Mediterranean.	Mediterranean Sea and Black Sea	Algeria, Belgium, Croatia, Egypt, France, Greece, Italy, Lebanon, Morocco, Romania, Spain, Switzerland, Tunisia, Turkey, United Kingdom, Ukraine	ICZM	Flanders Marine Institute (VLIZ)

Initiative (Date)	Description / Main objectives	Regional Sea/ Large Marine Ecosystem (LME)	Participating countries	Issues addressed	Source
PHAROS4MPAS – Blue Economy and Marine Conservation: Safeguarding Mediterranean MPAs to Achieve Good Environmental Status (2017-2018)	Capitalise on existing results and ultimately deliver an integrated framework for recommendations on the necessary practical collaboration between Mediterranean MPAs and eight maritime sectors: offshore windfarms, maritime traffic and ports, cruise and super yachts, scuba-diving, leisure boating, recreational fisheries, aquaculture, small scale fisheries.	Mediterranean Sea	Albania, Belgium, Croatia, France, Greece, Malta, Slovenia, Spain, Tunisia	Recommendations on collaboration between MPAs and maritime sectors	Interreg MED
Science and Policy Integration for Coastal System Assessment (SPICOSA) (2007-2011)	Create a self-evolving, operational research approach framework for the assessment of policy options for the sustainable management of coastal zone systems. SPICOSA contributed to the understanding of social interactions within coastal zone systems and how they impact the environment and future policies. It supported the implementation of existing EU Directives and ICZM good practices.	Mediterranean Sea (West and East), Black Sea; Baltic Sea, North Sea, Atlantic Ocean	Belgium, Bulgaria, Denmark, Estonia, France, Germany, Greece, Ireland, Italy, Israel, Latvia, Netherland, Norway, Poland, Portugal, Spain, Sweden, Turkey, Ukraine, United Kingdom	ICZM	SPICOSA Project
Seanergy 2020 – Delivering Offshore Electricity to the EU: Spatial Planning for Offshore Renewable Energies and Electricity Grid Infrastructures in an Integrated EU Maritime Policy (2010-2012)	Formulate concrete policy recommendations on how to best deal with MSP and remove MSP obstacles that stand against the deployment of offshore power generation. The project focuses particularly on offshore renewable energy technologies and related grid infrastructure. It will provide policy recommendations for a more coordinated approach of MSP and for a larger deployment of offshore renewable (wind, wave, tidal).	Mediterranean Sea (West and East), Baltic Sea, North Sea, Atlantic Ocean	Belgium, Germany, Greece, Lithuania, Netherlands, Portugal, United Kingdom	Development of MSP and renewable energies	European Commission

II.2.4. National maritime policies and instruments

II.2.4.1. The European Union

In the European Union (EU), the debate about a future **maritime policy** that treats the ocean and seas in a holistic way was launched through the adoption of the **Green Paper in 2006** calling for a comprehensive system of ecosystem-based spatial planning for European coastal waters to achieve **good environmental status (GES)** by 2021 (European Commission, 2006). But it is with the creation of the **Integrated Maritime Policy (IMP) in 2007**, known as the Blue Paper, that the European Union made the first step towards MSP. Built on environmental and economical pillars, the IMP was created with the aim to enhance the sustainable development of the European maritime economy and to better protect the marine environment (European Union, 2012 and Périssé *et al.*, 2019).

The following year, the **Marine Strategy Framework Directive (MSFD) (2008)** was established, expressing the necessity for an ecosystem-based management and requiring the Member States to achieve good marine environmental status (European Commission, 2008). The MSFD built another milestone for MSP in Europe, requiring in its Article 13(4) "to undertake spatial measures and spatial and temporal distribution control and management coordination measures, including management measures that influence when and where an activity is allowed to occur" (Périssé *et al.*, 2019).

Finally, in **2014,** the **Directive establishing a framework for Maritime Spatial Planning (Directive 2014/89/EU)**, later referred to as the MSP Directive, was built as a key instrument for the IMP and a tool to balance the development of maritime activities and increase cross-border cooperation through transparency, clearer legislation, better coordination between administrations and the early identification of impacts that can arise from the multiple uses of the marine space (Périssé *et al.* 2019).

In addition, the European Union ratified the Protocol on Strategic Environmental Assessment (SEA) in 2008. **The**

SEA Directive (Directive 2001/42/EC) transposes the Protocol into EU legislation. This regional directive is also an important legislative framework as it serves to implement the ecosystem approach, a key element of MSP. The **EU Tourism Policy, the Blue Growth Strategy, and the Common Fisheries Policy** are, as well, important regional policies that support the implementation of MSP in the EU.

II.2.4.2. France

The EU MSP Directive was transposed into French law through Ordinance 2016-1687 of 8 December 2016. The Ministry for the Sea is the responsible body for the implementation of this ordinance, supported by four maritime interregional directorates. The directorates will be mandated to apply MSP in their respective marine basins and develop a seafront strategic document called: "document stratégique de façade" for each of the four planning areas: East Channel-North Sea; North Atlantic-West Channel; South Atlantic; and Mediterranean.

In brief, the national political and administrative pillars supporting MSP and ICZM implementation in the French Mediterranean region are:

- The National Strategy for the Sea and Coast under Decree 2017-222 and the Maritime Seafront Strategy;
- The Mediterranean Sea Basin Strategy Document;
- The Action Plan for the Marine Environment in the Western Mediterranean Marine Sub-region;
- The Environment Code and the National Integrated Coastline Management Strategy;
- The Law of 3 August 2009 known as Grenelle 1; and
- The Law No. 86-2 of 3 January 1986 relative to the planning, protection and valorisation of coastal areas.

II.2.4.3. Italy

The MSP Directive was transposed into Italian legislation by the **Legislative Decree of 17 October 2016** establishing the Ministry of Infrastructure and Transport as the national competent authority for MSP. The Interdepartmental Coordination Board is the main tool for implementing MSP in Italy. This body issued guidelines on 1 December 2017 with guidance on how to prepare maritime spatial plans. Four maritime areas were identified: The Western Mediterranean Sea; the Adriatic Sea; the Ionian Sea and the Central Mediterranean area.

The most relevant tools formalising the implementation of marine spatial planning and ICZM in Italy are:

- The National Strategy for the Implementation of ICZM;
- The Italian Strategy for the Sea (transposing the EU Marine Strategy Framework Directive (2008/56/CE));
- The Bologna Charter (signed by Italy) that calls for greater participation of local and regional administrative entities for the development of the coastline.

II.2.4.4. Spain

The Royal Decree 363/2017 of 8 April 2017 established a national framework for MSP in Spain. In addition, the Spanish Marine Environment Act 41/2010 sets out the principles governing environmental planning through the implementation of the Marine Strategies Programme. The national authority in charge of MSP in Spain is the Ministry for the Ecological Transition and the Demographic Challenge and its Directorate General for the Coast and Sea. Five marine subdivisions were identified for the implementation of MSP: The North Atlantic, the South Atlantic, the Canary Islands basin, the Strait of Gibraltar/ Alboran Sea and the Levant and Balearic Islands. Strategic planning documents will be developed in the five marine subdivisions as part of the implementation of the Marine Strategy Programme and will be used as key tools for the implementation of MSP.

The important maritime policy and regulations supporting the implementation of marine spatial planning and ICZM in Spain are:

- The Royal Decree 715/2012 of April the 20th, creating an Inter-Ministerial Commission on Marine Strategies;
- The Royal Decree 1365/2018 of November the 2nd, approving the marine strategies;
- The Maritime Public Domain Act and Coastal Law;
- The Royal Decree 876/2014 of October the 10th 2014, approving the General Regulation of Coasts;
- The National Strategy for Integrated Coastal Zone Management (prepared in 2006). However, there is no national law specifically targeting the development of ICZM.

II.2.4.5. Malta

Malta has incorporated the EU MSP Directive into its legislation through the 2016 Marine Spatial Planning Regulation. The Development Planning Act approved

this regulation in 2016, establishing therefore a competent national authority for MSP. Malta approved a maritime zone development plan as part of the 2015 Strategic Plan for Environment and Development. This national programme allows to:

- Delineate territorial waters and coastal areas, and stimulate the implementation of ICZM;
- List maritime activities in order to minimise conflicts of use and to curb coastal erosion;
- Protect biodiversity, cultural heritage, and increase the resilience of marine habitats to the impacts of climate change.

The National Biodiversity Action Plan provides a comprehensive framework for the conservation of Malta's biodiversity over the period of 2012-2020. It serves as a driving force for integrating biodiversity conservation measures into relevant sectoral or cross-sectorial plans, programmes and policies. In addition, the National Environmental Policy (adopted in 2012) defines the principles through which the Maltese marine environment should be framed. It has a number of provisions related to ICZM and the protection of sensitive marine areas. It also outlines a Maritime Spatial Cadastral Plan in line with the EU's Integrated Maritime Policy.

II.2.4.6. Algeria

No national policy supporting the implementation of MSP in Algeria has been adopted; however, several policies regulating the maritime space and its activities were identified as follow:

- The Law No. 02-02 of February the 5th, 2002 on the protection and development of the coastline;
- The Presidential Decree No. 06-405 of November the 14th, 2006) ratifying the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean, signed in Barcelona on 10 June 1995;
- The Algerian National Integrated Coastal Zone Management Strategy, established in 2015 for the implementation of ICZM with a vision to ensure the sustainability of use of coastal areas and of the goods and services they provide, while preventing the natural environment's degradation(Ministère des ressources en eau et de l'environnement - UNEP/MAP- PAP/RAC, 2015);
- National Biodiversity Strategy and Action Plan (SPANB) 2016-2030 setting the conservation objective of at least 5% of marine and coastal areas by 2030 (Objective 12) (Ministère de l'Environnement et des Energies Renouvelables- GEF/ PNUD, 2016);
- Fisheries and Aquaculture Act No. 01-11 providing the rules and conditions for fishery and aquaculture activities; and
- The Law No. 03-02 of February the 17th, 2003 fixing the main rules of use and tourism exploitation of beaches .

It is worth noting that the first national training on MSP in Algeria took place on 14 April 2019 within the framework of the DIVECO programme, a partnership between Algeria and the EU, in order to familiarise relevant Algerian officials working in the maritime sector with MSP principles (WestMED Initiative, 2019).

II.2.4.7. Morocco

In 2018, Morocco adopted a strategic document supporting the blue economy and preparing a national programme to advocate for MSP in Morocco (Conseil economique social et environnemental, 2018). Whilst no national policy supporting the implementation of MSP has been enacted so far, the country has a set of legal and policy frameworks regulating the maritime space, its activities and establishing a framework for an integrated coastal management in the country as follow:

- The Dahir No. 1-15-87 of Ramadan the 29th, 1436 (16 july 2015) promulgating the Coastal Law No. 81-12 and establishing the fundamental principles and rules for sustainable integrated management, protection, development and conservation of the coast. The Law defines provisions for the development of a National Coastal Plan and concomitant Regional Coastal Plans.
- The National Coastal Plan for Integrated Coastal Zone Management focusing on coastal preservation, protection, conservation and developement. The Plan was validated in December 2019 and approved in February 2020 in preparation for its adoption by decree in accordance with the provisions of the Coastal Law No. 81-12;
- The National Strategy for Sustainable Development 2030 (SNDD) giving with a special focus on sensitive areas including the coastal zone (Issue 5- strategic focus 1) (Ministère de l'Énergie, des Mines et de l'Environnement, 2017);
- The Master Plan for the Development of the Maritime Public Domain by 2035, launched in 2016 with the objective of establishing a decision-making tool for the development of higher added-value investments to promote the value of the public maritime domain (Ministère de l'Équipement, du Transport, de la Logistique et de l'Eau, 2016).

It is worth noting that the **first national training on MSP in Morocco took place in Rabat on 27-28 November 2019** within the framework of the MSPglobal initiative. The training gathered thirty Moroccan representatives from governmental agencies, law enforcement, academia and research to share new knowledge, experiences and consider the next steps for MSP and the development of the sustainable blue economy in Morocco. The course was co-organised with the Ministry of Agriculture, Fisheries, Rural Development, Water and Forests.

II.2.4.8. Tunisia

In Tunisia, whilst no national policy supporting the implementation of MSP has been enacted so far, the country's integrated coastal zone management is at advanced stages – although it is mostly developed in design and planning, and is still in its infancy regarding implementation. Further legal and policy frameworks and directives regulating the maritime space and its activities and establishing a framework for an integrated coastal management in the country include:

- The Law 2009-49 of July the 20th, 2009 on Coastal and Marine Protected Areas;
- The Law 2005-50 of June the 27th, 2005 on the Exclusive Economic Zone;
- The Law 2003-78 of December the 29th, 2003 amending and supplementing the Code for Territorial and Urban Planning;
- The Master Plan for the Management of Sensitive Areas;
- The Law No. 94-13 on fishing;
- Coastal management programs.

It is worth noting that, although Tunisia signed the Barcelona Convention's ICZM Protocol, the country did not ratify it.

III. Status of marine environment and conservation

III.1. Introduction

With a surface area of 2.5 million km^2, the Mediterranean Sea is one of the largest semi-enclosed seas, the second largest of the world's 34 biodiversity hotspots and one of the world's important eco-regions (Gabrié *et al.,* 2012 and IUCN, 2015). It hosts important marine habitats, wide-ranging endemism, several critically endangered species, and a rich biodiversity representing 4% to 18% of the world's recognised marine species within an area of only 0.82% of the world's Ocean surface (Gabrié *et al.,* 2012 and Piante and Ody, 2015).

The diverse seabed landscape in the Western Mediterranean Sea supports extensive marine habitats and ecosystems such as seagrass meadows, coralligenous habitats and mäerl beds, rocky reef ecosystems, coastal lagoons and coastal soft-bottom communities, seamounts, unique benthic features and submarine canyons (Figure 4) (UNEP/MAP - CP/RAC, 2013 and Piante and Ody, 2015). These habitats provide breeding, feeding and resting areas for numerous marine species including several endemic fish species and invertebrates. Furthermore, they provide regulating and supporting ecosystem services such as stabilising the seashore, maintaining water quality and capturing carbon dioxide (Piante and Ody, 2015).

These habitats are home to diverse fauna and flora estimated at around 17,000 marine species distributed unevenly within the Mediterranean Sea basins. The species diversity increases from east to west, with the Western Mediterranean hosting the highest percentage of known forms of life (87%), followed by the Adriatic (49%) and the Eastern Mediterranean (43%) (UNEP/MAP - CP/RAC, 2013 and IUCN, 2015). This high species diversity in the Western Mediterranean is explained by its proximity and communication with the Atlantic Ocean through the Strait of Gibraltar. Additionally, the Western Mediterranean hosts more endangered species than other parts of the Mediterranean Sea.

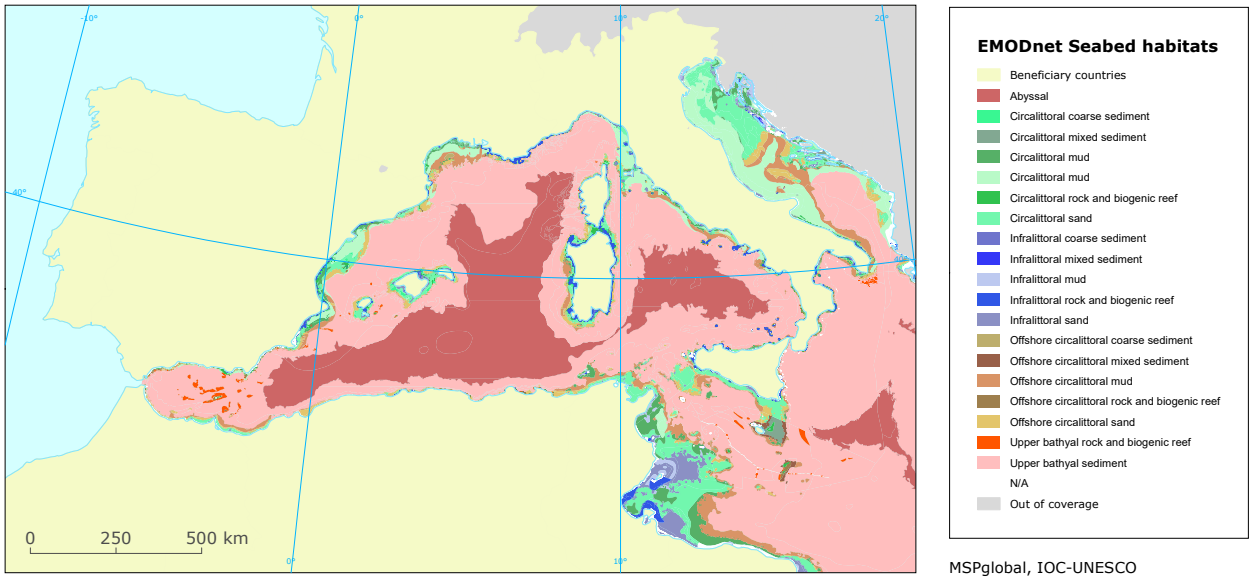


Figure 4
Seabed habitats in the Western Mediterranean Sea basin. (Data source: EMODnet).

The Mediterranean Sea hosts many emblematic species of particular conservation interest, such as the monk seal (*Monachus monachus*), the Atlantic bluefin tuna (*Thunnus thynnus*), sea turtles and nineteen species of cetaceans. According to Piante and Ody (2015) and IUCN (2015), the IUCN's Red List for the Mediterranean Sea includes a large number of marine species, such as sharks (seriously threatened), the Atlantic bluefin tuna (endangered), six species of marine mammals are listed as threatened with extinction (critically endangered, endangered and vulnerable), yet the Mediterranean monk seal remains the most critically endangered of all the Mediterranean species. Endangered habitats include the seagrass meadows of the endemic *Posidonia oceanica*, vermetid terraces built by the endemic gastropod *Dendropoma petraeum*, coralligenous assemblages as well as deep-sea and pelagic habitats that support unique species and ecosystems (IUCN, 2015).

Although significant differences in biodiversity trends can be observed between the Mediterranean sub-regions and between groups of habitats or species, the general trend in the Mediterranean biodiversity is a decline caused by various threats driven by natural forces and anthropogenic pressures related to an unprecedented "Blue Gold Rush" (PHAROS4MPAs, 2020). The Regional Activity Centre for Specially Protected Areas of the UNEP (RAC/SPA) identified 149 threats to the Mediterranean coastal and marine biodiversity, grouped by the IUCN (2015) into nine main categories:

- Pollution;
- Impact of natural resource use;
- Scarcity of freshwater;
- Changes in land use;
- Uncontrolled recreational activities;
- Uncontrolled expanding tourism, urban development and construction of infrastructure;
- Invasive species;
- International trade of endangered species; and
- Global warming, sea-level rise and ultraviolet radiation.

These pressures are causing the Mediterranean biodiversity and the ecosystems maintaining it to decline, causing 50% of its wetlands to disappear, 41% of its marine mammals' populations to decrease and more than half (53%) of its sharks to be at risk of extinction. Additionally, the Mediterranean seagrass *Posidonia oceanica* is at risk to decrease by 34%, and 31 freshwater taxa (mostly molluscs and fishes), previously present within the region, could go extinct at a global level (IUCN, 2015).

This decline in biodiversity calls for urgent action and decisive measures towards the conservation and protection of the Mediterranean natural capital. The economic assets generated by the Mediterranean Sea were valued at around €4.7 trillion and at €395 billion Gross Marine Product, making the Mediterranean Sea economy the fifth largest in the region. Ignoring nature's decline will put the health, well-being and prosperity of the people living along its coasts under threat (Gomei *et al.,* 2019 and PHAROS4MPAs, 2020).

III.2. Status of marine conservation in the Western Mediterranean

More than two decades ago, the Mediterranean countries adopted several legislations for the protection of their marine environment among which the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD) that came into effect in 1999 (UNEP/MAP - RAC/SPA, 1995). This protocol is the main Mediterranean tool for the practical implementation of the 1992 Convention on Biological Diversity (CBD) regarding the sustainable management of coastal and marine biodiversity. In order to ensure the safeguarding of biological diversity in the Mediterranean, the protocol envisaged three main elements:

1. The creation, protection and management of specially protected areas;
2. The establishment of a list of specially protected areas of Mediterranean importance; and
3. The protection and conservation of species.

The Specially Protected Areas Regional Activity Centre (RAC/SPA) of the UN Environment MAP-Barcelona Convention was founded to coordinate and support the activities of the Mediterranean coastal States related to the implementation of the SPA/BD Protocol. It is worth noting that compared to previous protocols, the innovation that the SPA/BD brought is offering the Contracting Parties (CP), for the first time, the possibility of creating marine protected areas (MPAs) within the waters outside of their national jurisdiction (European Environment Agency, 1999 and UNEP/MAP - RAC/SPA, 2018).

In 2010, the Mediterranean countries adopted another legislation for the protection of their marine environment by signing the Convention on Biological Diversity's Aichi Target 11 and committing to protect at least 10% of their waters by 2020 with the creation of effective marine protected areas (United Nations, 1992 and Amengual and Alvarez-Berastegui, 2018). Indeed, the Mediterranean riparian countries have been working to establish new MPAs to reach this goal.

However, according to Gomei *et al.* (2019) and PHAROS4MPAs (2020), although "9.68% of the Mediterranean Sea has been designated as MPAs currently, only 2.48% is covered by MPAs with a management plan, only 1.27% by MPAs that effectively implement their management plan; only 0.03% by fully protected areas". This highlights the countries' challenge to designate and effectively manage their MPAs.

III.2.1. Specially protected areas of Mediterranean importance

The SPA/BD Protocol decided the establishment of a list of specially protected areas of Mediterranean importance (SPAMIs) intending to promote cooperation in the management and conservation of natural areas, as well as in the protection of threatened species and their habitats. According to the protocol, to be included as SPAMIs, the sites should be "of importance for conserving the Mediterranean biological diversity, contain ecosystems specific to the Mediterranean area or the habitats of endangered species, and present a special interest at the scientific, aesthetic, cultural or educational levels" (European Union, 1999 and MedPAN and SPA/RAC, 2019).

Since 2001, the Barcelona Convention has adopted 35 SPAMIs proposed by ten Mediterranean countries in the Sea basin. Thirty of which are located within the Western Mediterranean, in addition to the designation of the transboundary Pelagos Sanctuary for the Conservation of Marine Mammals created as a tripartite international agreement between France, Italy and Monaco.

Table 2
Specially Protected Areas of Mediterranean Importance (SPAMIs) in the Western Mediterranean created between 2001 and 2017.

Countries within the Western Mediterranean pilot project	SPAMIs site designations
Italy	10
Spain	9
France	5
Tunisia	3
Algeria	2
Morocco	1
Malta	N/A

(Source: UNEP/MAP - RAC/SPA, 2018).

The SPAMIs cover about 3.57% (or 89,856 km^2) of the Mediterranean Sea; however, it is worth noting that the SPAMI designation is an additional layer overlapping previously established designations (e.g., MPAs). As such, it does not bring any additional regulation to the area and may therefore be considered as a label rather than a protection designation per se (MedPAN *et al.*, 2016 and MedPAN and SPA/RAC, 2019).

III.2.2. Particularly sensitive sea area

Particularly Sensitive Sea Areas (PSSAs) are designed by the Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO) to enhance the comprehensive review and protection of specific areas under existing or potential IMO measures. The designation of PSSAs is not connected to any convention (Ardron, 2007).

According to the IMO (2006), PSSAs are "areas of recognised ecological, socio-economic or scientific significance whose attributes may be vulnerable to damage by international shipping activities"; therefore, they need special protection through IMO action. The IMO Resolution A.982(24)(2006) advises that when designing a PSSA, "an associated protective measure, which meets the requirements of the appropriate legal instrument establishing such measure, must have been approved or adopted by the IMO to prevent, reduce or eliminate the threat or identified vulnerability" (IMO, 2006).

To date, seventeen PSSAs have been designated globally. Only one is located in the Mediterranean Sea: The Strait of Bonifacio (France - Italy), created in 2011 by the IMO and covering an area of 10,956 km2 representing 0.44% of the Mediterranean Sea (MedPAN *et al.*, 2016 and IMO, 2020) (Figure 5). Within the Strait of Bonifacio PSSA, the only associated protective measure defined by the MEPC on July 2011 is a "Recommendation on navigation" in order to improve navigation safety and protection of the marine environment within the strait (Resolution MEPC.204 (62)) (IMO, 2011).

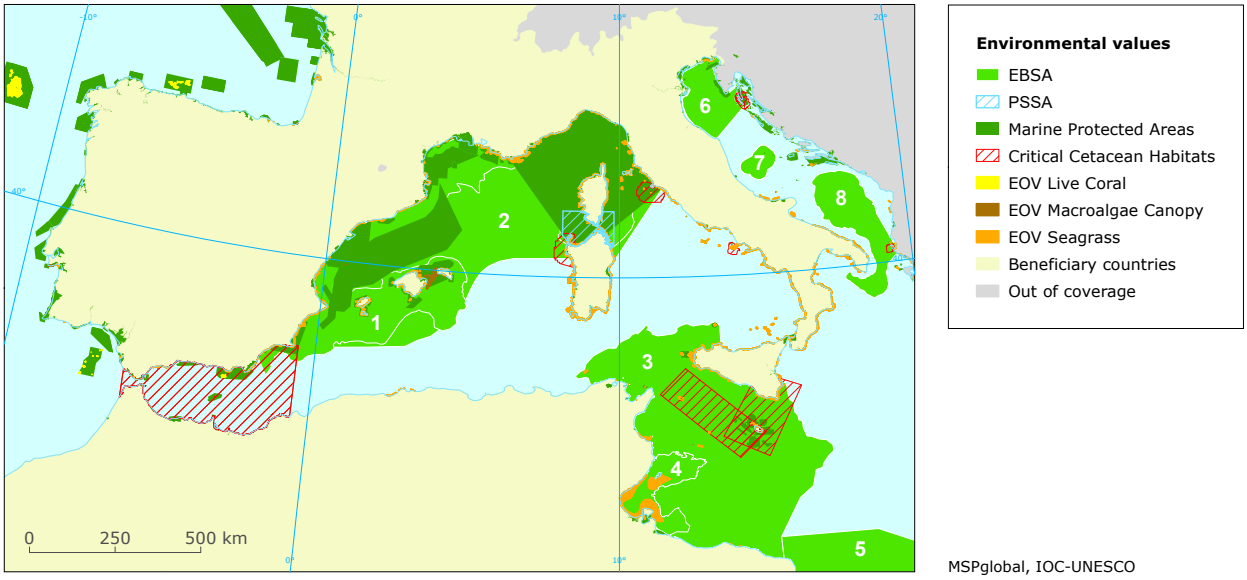


Figure 5
Marine conservation and protection measures in the Western Mediterranean; 1 to 8: Adopted EBSAs in the Western Mediterranean. (Data source: EMODnet, MAPAMED, MedPAN and SPA/RAC, 2019).

The PSSAs serve as a strong tool to be considered by planning authorities while drafting marine spatial plans to prevent accidents and deriving environmental impacts. It is recommended by PHAROS4MPAs (2020) to use such tool to protect MPAs from the risk of maritime traffic accidents and to reduce the chances of collisions with cetaceans through the establishment of coordinated monitoring programs on navigation routes and marine mammal range by national authorities.

III.2.3. Ecologically or biologically significant marine areas

Ecologically or Biologically Significant marine Areas (EBSAs) are defined by the Convention on Biological Diversity secretariat (2008) as "geographically or oceanographically discrete areas that provide important services to one or more species or populations of an ecosystem or to the ecosystem as a whole, compared to other surrounding areas or areas of similar ecological characteristics", or otherwise meet the following criteria adopted during the 9th Conference of the Parties to the CBD:

1. Uniqueness or rarity;
2. Special importance for life-history stages of species;
3. Importance for threatened, endangered or declining species and/or habitats;
4. Vulnerability, fragility, sensitivity, or slow recovery;
5. Biological productivity;
6. Biological diversity;
7. Naturalness (CBD Secretariat, 2008).

The intent for defining EBSAs was initially driven to support countries in identifying MPAs in areas beyond their national jurisdictions and to achieve the global Aichi Biodiversity Targets for 2020, in particular Target 11. However, since then, designing EBSAs has broadened to allow for the possibility of including various aspects of environmental management within and beyond national jurisdictions such as marine spatial planning (CBD Secretariat, 2011 and MedPAN and SPA/RAC, 2019).

According to the Global Ocean Biodiversity Initiative (GOBI), more than 321 EBSAs are recognised around the world, fifteen of which were adopted in the Mediterranean Sea and among which eight in its Western sea basin (Figure 5) (MedPAN and SPA/RAC, 2019 and GOBI, 2020):

1. The North-Western Mediterranean Benthic Ecosystem;
2. The North-Western Mediterranean Pelagic Ecosystem;
3. The Sicilian Channel;
4. The Gulf of Gabès;
5. The Gulf of Sirte;
6. The Northern Adriatic;
7. The Jabuka/Pomo Pit;
8. The South Adriatic Ionian Strait.

After the adoption and recognition of the EBSAs by the Contracting Parties to the CBD, all the Parties are encouraged, along with governments and competent intergovernmental organisations, "to cooperate, as appropriate, collectively or on a regional or sub-regional basis, to identify and adopt, according to their competence, appropriate measures for conservation and sustainable use in relation to EBSAs, by establishing representative networks of MPAs in accordance with international law, including UNCLOS, and based on the best scientific information available" (CBD Secretariat, 2010).

III.2.4. Marine protected areas

In the context of the Mediterranean, and for the specific purpose of inclusion in the MAPAMED MArine Protected Areas in the MEDiterranean database (MAPAMED) (Table 1), the generic term "marine protected area" (MPA) was adapted by Claudet *et al.* (2011) as "a clearly defined marine geographical space – including subtidal, intertidal and supratidal terrain and coastal lakes/lagoons connected permanently or temporarily to the sea, together with its overlying water – recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values."

MPAs are recognised as the most effective conservation and management tool to safeguard marine biodiversity, protect its ecosystems and manage their alteration. Nevertheless, in the Mediterranean Sea, the type of protection applied in MPAs is variable, whether in conservation targets (e.g., specific animals or habitat types), sustainable development goals or frameworks and legislations under which they are designed (national, regional or international). Therefore, no common protection status exists for the areas designated as MPAs in the Mediterranean. Additionally, there are almost fifty different names for MPAs or other effective area-based conservation measures (OECMs) (e.g., national park, natural reserve, marine park, etc.) offering a range of different levels of protection (MedPAN and SPA/RAC, 2019 and PHAROS4MPAs, 2019).

To safeguard marine and coastal environments, the Mediterranean riparian countries pledged to protect at least 10% of the Sea's marine waters by 2020 by creating effective MPAs under the Convention on Biological Diversity's Aichi Target 11 and the Barcelona Convention. Since then, various types of marine protected areas have been established in the Mediterranean Sea under different legislative frameworks, reaching today 1,231 MPAs and OECMs covering 179,798 km^2, accounting for more than 7% of the Mediterranean surface area (MedPAN et al., 2016).

Although this number can be encouraging and implies that the region has almost reached the Aichi Target, essentially, "only 2.48% of the Mediterranean Sea is covered by MPAs with a management plan, only 1.27% of the MPAs effectively implement their management plans, and fully protected areas cover only 0.03% of the Mediterranean"; this situation has led to the designation of these MPAs as *paper parks* as they lack any management and monitoring systems (Gomei *et al.*, 2019 and PHAROS4MPAs, 2020). Additionally, most MPAs created are located in the North-Western Mediterranean, with only a few along its southern and eastern coasts (Figure 5).

Furthermore, in the past ten years, according to Gomei *et al.* (2019), most countries have made no efforts to designate additional areas and that the increase in MPA cover is due to France and Spain with a small contribution from Albania, Croatia, Greece and Malta, and a minimal area of new MPAs designated in Egypt, Italy, Slovenia and Turkey. Therefore, there is still potential to increase these areas to 10% to reach the CBD target and the Barcelona Convention, especially as negotiations are taking place to define new post-Aichi nature protection targets to move beyond the 10% of protected marine ecosystems and up to 30%, even 50% of protection for the world's ocean by 2030 (PHAROS4MPAs, 2020).

Expanding existing MPAs and creating well-managed ones allow for the protection and restoration of key habitats and the maintenance or enhanced flows of ecosystem services provided by the protected marine ecosystems. Replenishing thus, fish stocks, increasing yields of nearby fisheries and increasing tourism activities and recreational benefits. It was estimated that expanding the coverage of MPAs from 10% to 30% could lead to benefits exceeding costs by 3 to 19 folds. In Cabo de Palos (Spain), after being designated as an MPA in 1995, the number of dives increased by 225% between 1998 and 2010, leading to a local added value of €870,000 per year and the creation of twenty local jobs (Brander *et al.,* 2015 and Union for the Mediterranean, 2017).

III.2.5. Other international designations

In addition to reporting under multilateral agreements (e.g., Barcelona Convention), the Mediterranean countries report to other international conventions, agreements or international organisations recognised by Mediterranean countries for the designation of areas with ecological, socio-economic and/or cultural importance. The table below (Table 3) presents the international designations within the Mediterranean Sea and their percentage of protection (IUCN, 2015 and MedPAN *et al.,* 2016 and MedPAN and SPA/RAC, 2019).

Table 3
International designations and their percentage of protection within the Mediterranean Sea.

International designations and agreements	International organisation	Percentage of coverage in the Mediterranean Sea
UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage	UNESCO	0.01%
Man And Biosphere (MAB) Programme of UNESCO	UNESCO	0.06%
Convention on Wetlands of International Importance, known as RAMSAR sites	RAMSAR Secretariat	0.13%
Natura 2000 sites: • The EU Habitats Directive • The EU Birds Directive	European Union	 1,56 % 1,64 %

(Source: IUCN, 2015 and MedPAN et. al., 2016 and MedPAN and SPA/RAC, 2019).

IV. Status of maritime activities

IV.1. Introduction and methodology

In the context of supporting the regional pre-planning phase of marine spatial planning in the Western Mediterranean Sea, a regional analysis of the current activities and uses of the sea was carried out and will be presented in this section. The analysis will follow a transboundary approach analysing the status of current maritime activities; each subsection will examine each sector's current status and future trends, their socio-economic value and benefits and the challenges they pose to the environment.

To carry this analysis, the methodology followed consisted of:

- Compiling existing data and information on current ecological, physical and socio-economic aspects for both coastal and marine areas by consulting regional data sources (e.g., EMODnet, SIMWESTMED Data Portal, etc.) and requesting data from the MSPglobal National Focal Points in each country when data proved to be unavailable;
- Analysing spatial data quality and availability, including sector/activity status and trends;
- Creating a repository of coastal and marine data and information for the Western Mediterranean.

This exercise served to map the important biological and ecological areas and the current human activities within the limits of the pilot case study, produce a cartography assessment of conflicts and compatibilities amongst human uses and in between human uses and the environment, and develop three scenarios to illustrate the future development of the pilot project area.

While carrying out the mapping exercise, multiple challenges were faced: in terms of data collection, the challenges pertained to the unavailability of data and

not receiving it despite multiple requests sent to the MSPglobal National Focal Points, especially in the southern Mediterranean countries. This affected the analysis, leading to an under-representation of the Member States from the southern shore of the Mediterranean. An inventory of the data gaps is present in Annex 1.

In terms of data format, some of the data found and/or received were only available in Web Map Service (WMS) format, which presented limitations to our work. Other challenges were also encountered when re-using data collected from other projects such as SIMWESTMED, where although the project was regional, the data was not harmonised at a regional level.

To face these challenges, the data was complemented by collecting statistical data and consulting the latest recent regional studies, such as PHAROS4MPAs (2020) and the recently released State of World Fisheries and Aquaculture by FAO (2020a), among others.

IV.2. Fisheries

IV.2.1. Status of fisheries in the Western Mediterranean

In the Mediterranean Sea, fishing is a traditional activity that goes back to ancient times. Taking advantage of this enclosed sea's ecological diversity, fisheries developed over time, making it one of the major sources of nutrition, employment and income for the coastal communities of the Mediterranean countries.

During the second half of the 20th century, the total marine capture of fisheries production in the Mediterranean rose from 420,000 tons in 1950 to reach a peak of 1,128,000 tonnes in 1995. It started to irregularly decline to 850,000 tons in 2016 before stabilising (FAO, 2018). The fisheries catch in the Western Mediterranean followed the same global declining trend that stabilised around 2016 (Figure 6). The annual revenue of marine capture fisheries in the Mediterranean is estimated at USD 2.44 billion, which is considered as an underestimation due to the considerable portion of the Mediterranean fish catch not sold through regulated markets (Piante *et al.,* 2019).

IV.2.2. The landed value of fisheries

According to FAO (2018), the average landings for the Mediterranean Sea over the 2014-2016 period amounted to 827,000 tonnes. In the Western Mediterranean countries part of the General Fisheries Commission for the Mediterranean area of application (GFCM), the ranking of capture fisheries production in 2014-2016 was dominated by Italy (185,262 tonnes), Algeria (96,258 tonnes), Tunisia (113,995 tonnes) and Spain (78,218 tonnes) accounting for 92% of all landings in the Western Mediterranean (Figure 7). They are followed by countries contributing five percent or less of the total capture: Morocco (27,496 tonnes), France (14,047 tonnes) and Malta (2,420 tonnes).

According to our analysis based on FAO (2018) data, the pilot project area shows the highest capture fishery production in weight in the Mediterranean totalling 518,000 tonnes on average in 2014-2016, while the Adriatic Sea, the central and eastern Mediterranean production accounted respectively for 193,500, 184,500 and 180,800 tonnes (FAO, 2018).

Fisherman repairing his fishing net in the port of Gallipoli, Apulia region, Italy.
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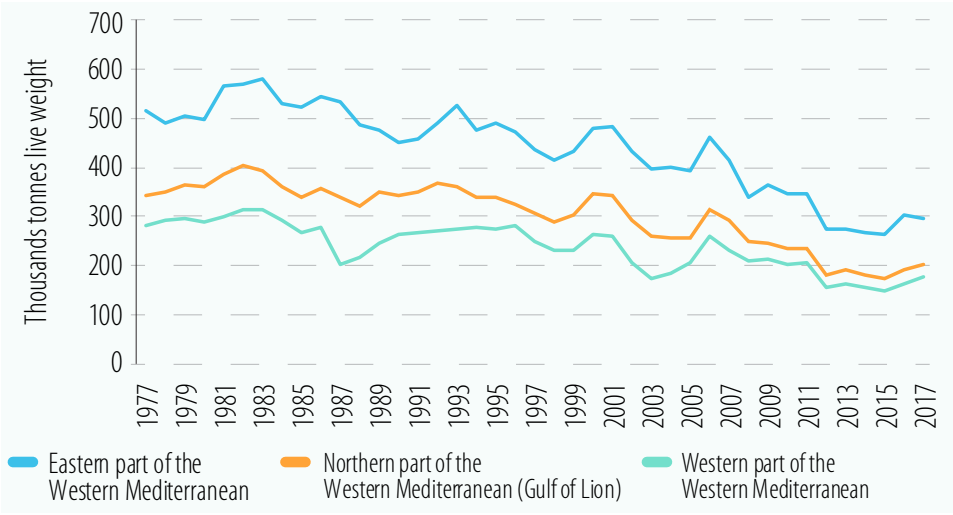

Figure 6
Fisheries catches in the Western Mediterranean Sea between 1977 and 2017 by thousands of tonnes live weight per year.
(Data source: EMODnet and Fish Catches by FAO from EUROSTAT).

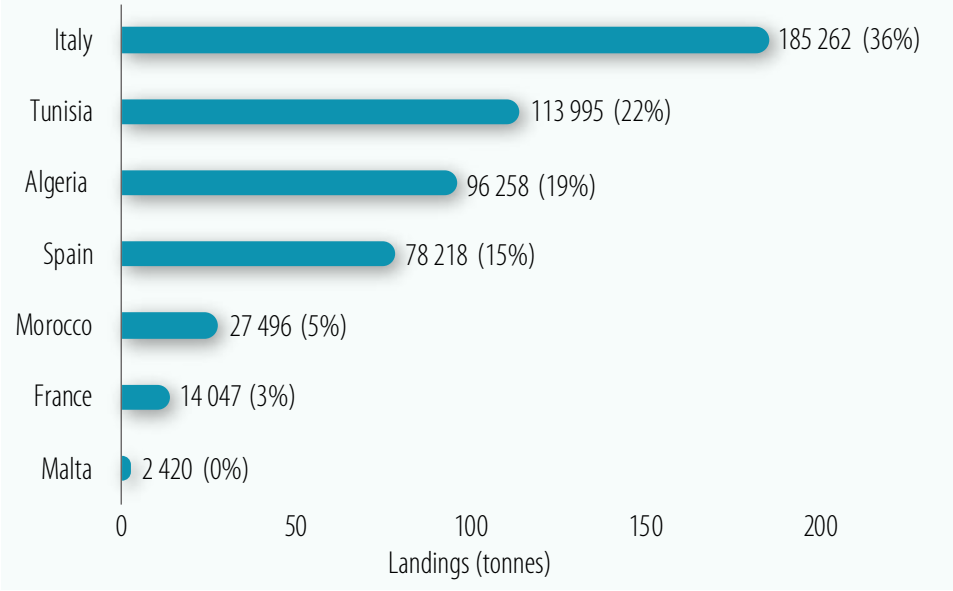

Figure 7
Average landings of capture fisheries by the Western Mediterranean countries and percentage of their contribution to the Total catch in the GFCM area of application (2014-2016).
(Source: adapted from FAO, 2018).

In the Mediterranean, recreational fishing is a fast-growing activity, representing approximately 10% of the total fish production. Although no estimation was found in the literature, it is considered that illegal fishing adds extra pressure on fishing resources (PHAROS4MPAs, 2020).

In 2016, the commercial fishing fleet in the Mediterranean consisted of some 74,900 vessels (Piante *et al.*, 2019). According to PHAROS4MPAs (2020), there are 36,052 reported fishing boats in the Western Mediterranean countries, with Italy accounting for the larger share of vessels (12,468), followed by Tunisia (11,522) then Algeria (4,777) (Figure 8); the three countries totaling 80% of the fishing vessels present in the Western Mediterranean countries.

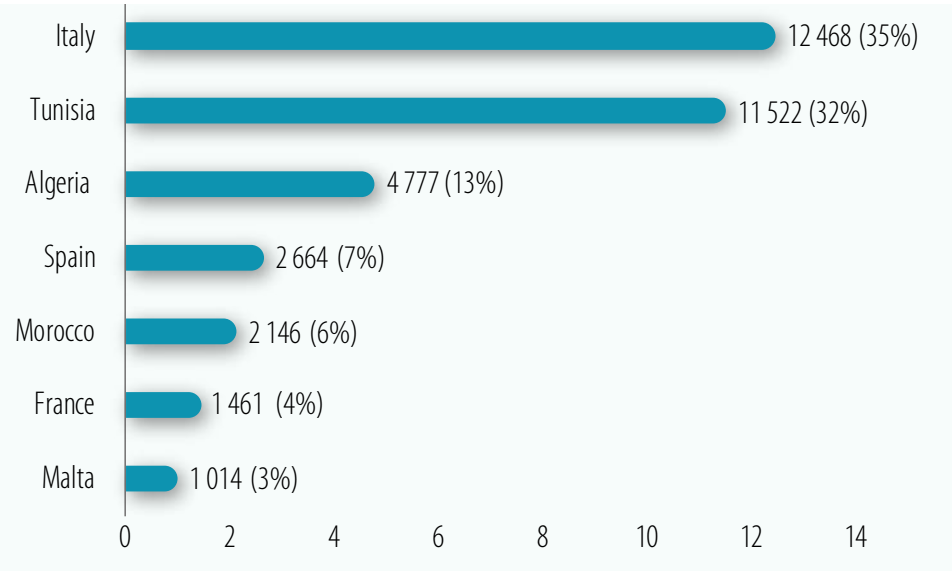

Figure 8
Reported fishing boats in the Western Mediterranean countries in 2016. (Source: adapted from PHAROS4MPAs, 2020).

IV.2.3. Socio-economic value of fisheries

In the Mediterranean, artisanal or small-scale fisheries (SSF) make up most of the commercial fishing sector, both in terms of the number of boats (83% of the total fishing fleet) and of people employed (57% of the entire workforce) (PHAROS4MPAs, 2020). In fact, except for Egypt and Spain, small-scale fisheries represent more than 50% of the fishing fleet in the twenty countries assessed by the PHAROS4MPAs regional study.

The annual revenue of marine capture fisheries in the Mediterranean Sea was estimated at USD 2.44 billion accounting for the value at the first sale before any processing or value addition activities (FAO, 2018). According to the same source, this value can double to 2.6 times the value at the first sale if the broader economic impact of fisheries (direct, indirect and induced) in the Mediterranean is accounted for, which might result in an annual revenue of marine capture fisheries reaching approximately USD 6.34 billion.

The Western Mediterranean countries part of the pilot project account for the highest landing value totalling USD 1.7 billion which represents 70% of the total landing value, making the Western Mediterranean the leading sub-region (Figure 9). Within the seven countries the value of landings in Italy is taking the lead accounting for almost half of the total revenue (48%).

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The **annual revenue** of marine capture fisheries in the Mediterranean Sea was estimated at **USD 2.44 billion**

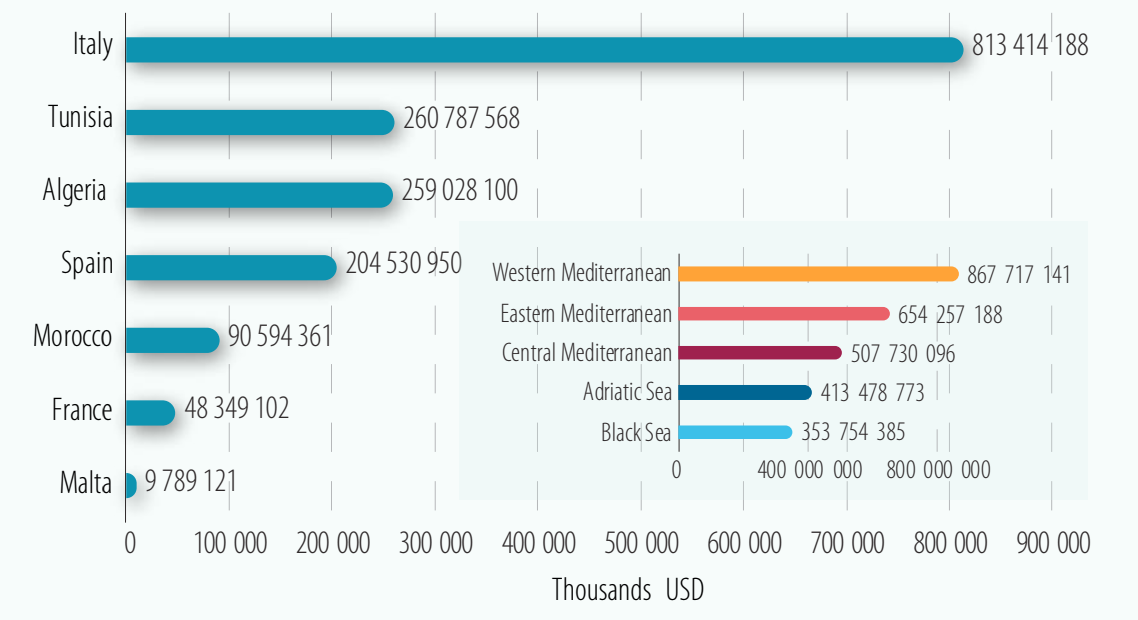

Figure 9
Landing value at first sale by the Western Mediterranean countries and Landing value by the GFCM sub-regions in constant 2016 USD.
(Source: adapted from FAO, 2018).

IV.2.4. Challenges of fisheries

Notwithstanding the socio-economic importance of the Mediterranean Sea's fisheries, the sector is currently facing unprecedented challenges due to over-exploitation and marine resource depletion. According to FAO (2020a), in 2017, among FAO's sixteen major fishing areas globally, the Mediterranean and the Black Sea have the largest proportion of stocks fished unsustainably (62.5%). While the FAO (2018) estimated the average landings of the Mediterranean Sea, over the 2014-2016 period, at 827,000 tonnes; SeaAroundUs calculated the total catch volume in the Sea in 2014 at around 1.7 million tonnes. This value considered, in addition to FAO data, the fisheries' volume caught but not reported in the official data (unreported catch) and estimated the amount of accidental catches, fish discarded at sea, recreational and subsistence fishing and illegal fishing (Figure 10).

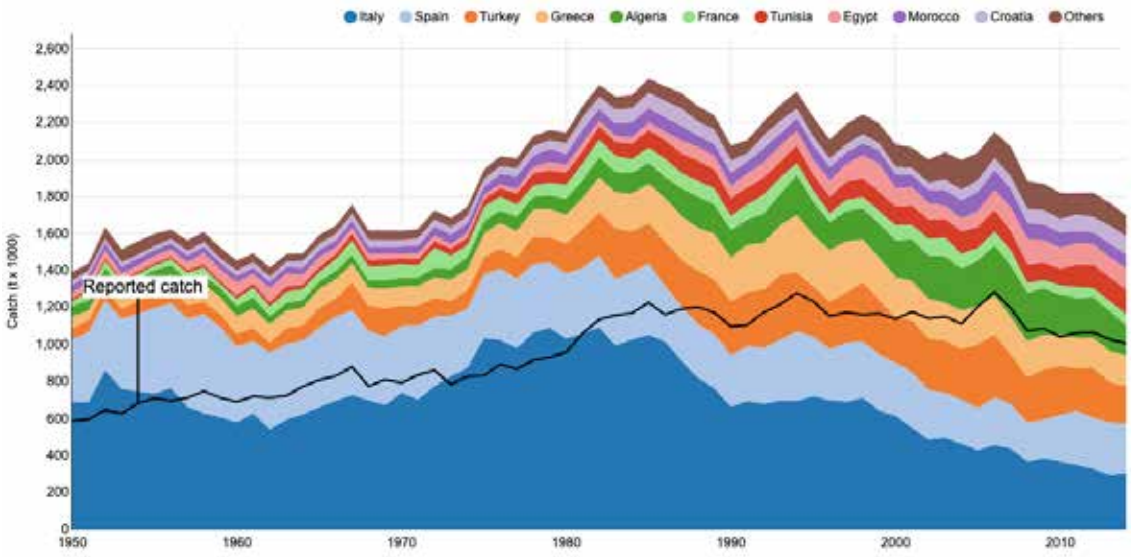

Figure 10
Amount of fish catches by Mediterranean countries between 1950-2014.
(Source: SeaAroundUs.org)

Due to this excessive pressure on stocks over the past two decades, a substantial decrease in fisheries catches since 2008 can be observed (Figure 6). According to PHAROS4MPAs (2020), around 80% of all measured stocks are fished beyond safe biological limits, and catches are declining and regional fleets are reducing. In the EU Mediterranean countries, the number of active fishing units decreased by 30% over the period 1995-2016 (Maynou, 2020). Additionally, the effect of climate change, environmentally degrading practices, coastal urbanisation, marine and terrestrial pollution, and the rise of recreational fishing catch in the Mediterranean puts more pressure on fish stocks.

Small-scale fisheries (SSF), although usually seen as more sustainable and generally considered to have a less ecological impact than industrial fisheries, still have the potential to cause serious impacts when, for example, the fishing effort is very high or if the targeted species are vulnerable. In fact, in the Mediterranean, the majority of the target species of SSF are classed by the IUCN Red List as vulnerable. An analysis off the coasts of France, Italy and Spain, found that almost 50% of the total SSF catch in coastal waters, and 100% in offshore waters, targeted vulnerable species. Among the species caught, 27 vulnerable vertebrate species including birds, cetaceans, sharks and rays, sea turtles and some fish species (Piante *et al.,* 2019).

The SSF around Europe's Mediterranean coasts has also been shown to impact vulnerable habitats, including seagrass meadows (*Posidonia oceanica*), coralligenous reef assemblages and deep rocky habitats (Piante *et al.,* 2019). Other potential impacts of SFF include: altering biodiversity and changing ecosystem functioning, size-selective fishing affecting hermaphrodite fish species, catches below the minimum landing size and lost or abandoned fishing gear (PHAROS4MPAs, 2020).

In the Mediterranean, fishery discards' volume amounts to around 230,000 tonnes per year (around 18% of total catch) (FAO, 2018). The reported incidental catch among the vulnerable groups in the Mediterranean indicates that sea turtles (around 80%) and elasmobranchs (around 16%) show the highest percentages. Seabirds and marine mammals, on the contrary, are apparently the groups with the lowest number of incidental catch events (around 4% of the total) (FAO, 2018). Marine turtles, on the other hand, accounts for an overall annual bycatch amounting to over 132,000 individuals with an annual mortality of approximately over 44,000 (Piante *et al.,* 2019).

The Espeto, a traditional culinary dish of Málaga, Spain.
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IV.3. Aquaculture

IV.3.1. Current status and future trends of aquaculture

In 2018, global fish production from aquaculture is estimated to have reached about 82 million tonnes with a total first sale value estimated at USD 250 billion, accounting for around half (46%) of the total fish production worldwide (FAO, 2020a). And with the decline of fish stocks at the global scale, the aquaculture sector is expected to continue developing and is projected to supply over half of the fish used for human consumption by 2025 (Randone *et al.*, 2019).

In the Mediterranean, the development of the aquaculture sector mirrored global trends, it has been growing exponentially since the 1970s and its production has quadrupled in size within one decade, from 1996 to 2016 (Figure 11) (Randone *et al.*, 2019). This rapid increase in aquaculture production is due to the expansion of marine and brackish water aquaculture and is driven by several factors such as a strong political will, national and international financial aid and subsidies, important public and private investments as well as the advancement of technologies (Massa *et al,* 2017). Now, the aquaculture sector contributes to over half of the overall fishery production in the Mediterranean and is expected to expand further (PHAROS4MPAs, 2020). As wild fish stocks continue to decline globally and the demand for seafood continues to increase, aquaculture is considered to be the most efficient method to convert feed to edible protein with a lower environmental footprint than other livestock production systems; for this reason, the EU's Blue Growth Strategy considered it as one of its five priority sectors (PHAROS4MPAs, 2020).

In the West Mediterranean pilot project, the long-term trend in total marine aquaculture production has multiplied by six since 1950 with an exponential increase in 1970 following worldwide trends. This increase has reached the highest level ever recorded in 1999 with a total production of 665,434 tonnes before suffering a slight decline to increase again in 2018 and reach a total production of 627,058 tonnes (FAO, 2020b).

Fisherman working in a mussels and oysters aquaculture facility in the Ebro Delta, Catalonia region, Spain.
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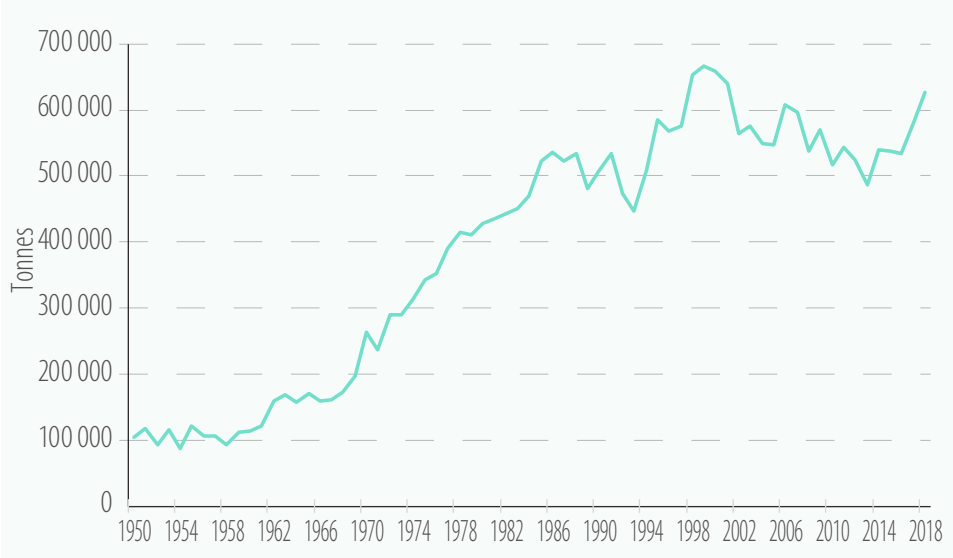

Figure 11
Total aquaculture production volume in tonnes in the Western Mediterranean countries, 1950-2018. Data are for fish, shellfish, crustaceans and aquatic Plants farmed in brackish and marine waters.
(Source: adapted from FAO, 2020b).

IV.3.2. The landed value of aquaculture

According to the FAO (2020a), world aquaculture production attained an all-time high record of 114.5 million tonnes in live weight in 2018, with a total sale value of USD 263.6 billion. In the Mediterranean countries, the total aquaculture production increased from 643,000 tonnes in 2000 to more than 1.5 million tonnes in 2016. In the same year, marine and brackish waters aquaculture reached a total volume of more than 480,000 tonnes, doubling the total sale value from USD 1.7 billion, in 2010 to USD 3.6 billion, in 2016 (Randone *et al.*, 2019).

Offshore aquaculture facility in the Frioul archipelago off the coast of Montpellier, France.
© Ekaterina Pokrovsky/Shutterstock.com.

The total marine aquaculture production in the Western Mediterranean countries (considering fish, shellfish and crustaceans and aquatic plants farmed in marine and brackish waters) slightly increased from 538,000 tonnes in 2008 to 627,000 in 2018, the main contributors to this volume of production accounting for 95% in 2018 are Spain (54%), France (24%) and Italy (17%) (Figure 12) (FAO, 2020b). The total sale value of aquaculture in the same year reached almost USD 1.9 billion, with the same three countries accounting for around 87% of this figure, and France receiving the highest annual revenues of about USD 704 million (Figure 13) (FAO, 2020b).

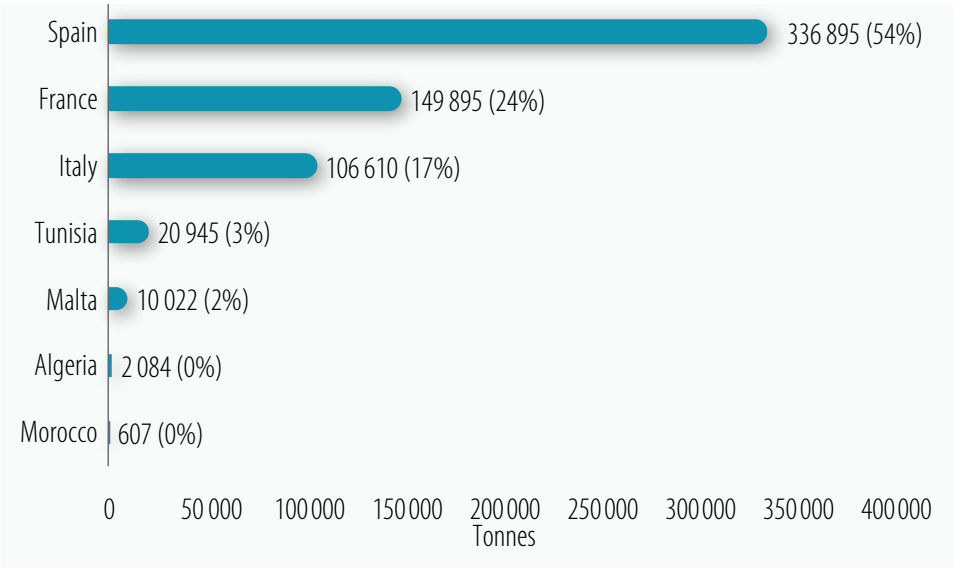

Figure 12
Annual aquaculture production in tonnes in the Western Mediterranean countries in 2018. Data are for fish, shellfish, crustaceans and aquatic plants farmed in brackish and marine waters.
(Source: adapted from FAO, 2020b).

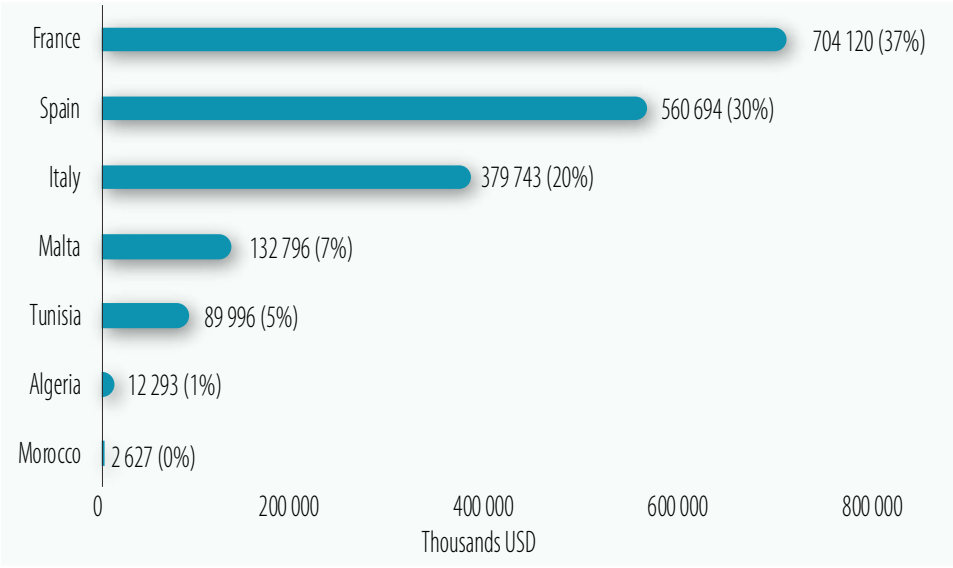

Figure 13
Aquaculture value in 1000 USD in the Western Mediterranean countries in 2018. Data are for fish, shellfish, crustaceans and aquatic plants farmed in brackish and marine waters.
(Source: adapted from FAO, 2020b).

Marine aquaculture in the Western Mediterranean is mostly driven by finfish and shellfish farming. A couple of algae farms exist in southern France and one farm combining both shellfish and algae aquaculture in northern Morocco (Figure 14). The study estimates around 785 aquaculture facilities of shellfish, finfish and algae farming operating in the region the majority of which practice finfish farming, especially in the western part (Spain and Morocco), by contrast with the eastern part where shellfish farming is more practised (Italy).

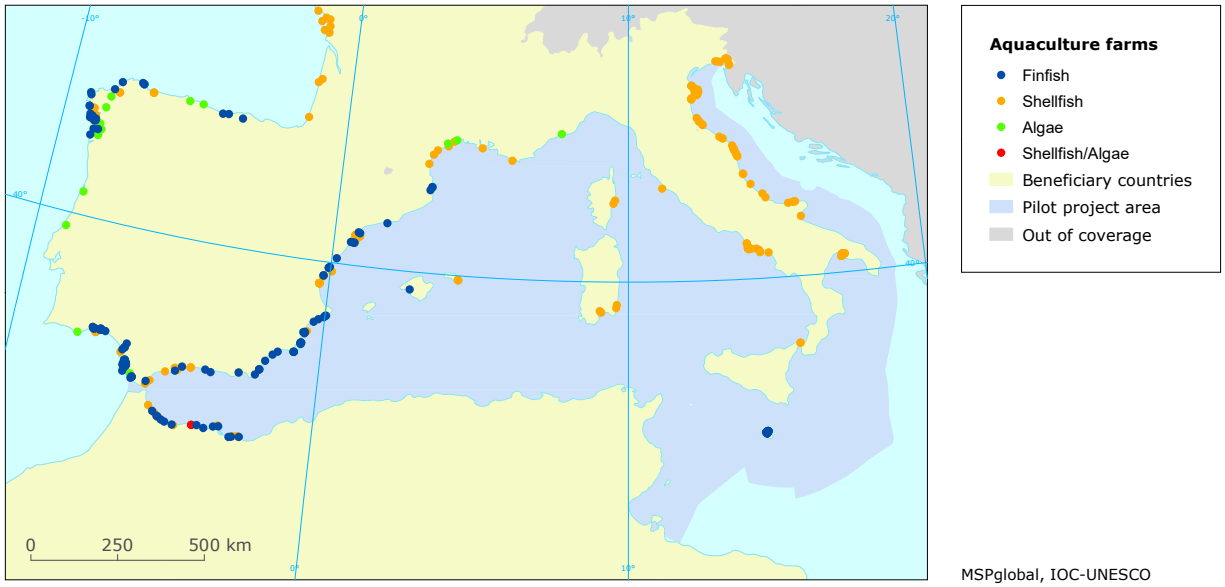

Figure 14
Aquaculture farms in the Western Mediterranean.
(Data source: EMODnet and adapted by IOC-UNESCO from national sources).

IV.3.3. Socio-economic value and challenges of aquaculture

In the Mediterranean and the Black Sea, aquaculture plays an important socio-economic role in coastal communities by being directly responsible for more than 313,000 jobs (Randone *et al.*, 2019). Despite this socio-economic importance in terms of employment and fish and shellfish production, the sector comes with several issues and environmental impacts, including habitat degradation, biodiversity loss and introduction of non-indigenous species, social conflicts and pollution (Randone *et al.*, 2019 and PHAROS4MPAs, 2020). Nonetheless, these environmental effects depend significantly on the size of the farms, the production methods and management styles employed, and their location within marine habitats (PHAROS4MPAs, 2020).

IV.4. Offshore oil and gas extraction

IV.4.1. Current status and future trends of offshore oil and natural gas production

The history of oil and gas production and exploration in the Mediterranean Sea goes back to the early 20th century when hydrocarbon exploration activities started in the Adriatic Sea by Italy in the 1950s. Greece then made a small number of significant oil discoveries in the mid-1970s in the Aegean Sea, and Italy and Libya in the Gulf of Gabès in the 1970s to1980s (Kostianoy and Carpenter, 2018).

Today, the energy demand is reflected by a swift development of offshore oil and gas exploration contracts, covering more than 20% of the Mediterranean Sea, with potential new contracts covering another 20% of the sea basin (Piante and Ody, 2015). The offshore oil and gas sector are expected to keep growing during the upcoming decade where offshore gas production is projected to multiply by five times during the period 2010 to 2030 leading to an increase in output from 55 million tonnes of oil equivalent (Mtoe) per year to 250 Mtoe per year at the Mediterranean regional level. The key factors behind this growth are national and global energy demand, international oil prices, global oil and gas supply, technology development and the financial institutions' investments (Piante and Ody, 2015).

IV.4.2. Value estimation of offshore oil and natural gas production

In 2011, oil reserves in the Mediterranean region represented 9,400 Mtoe which is equivalent to 4.6% of the

world oil reserves. However, the total offshore oil and gas production was estimated at only 87 Mtoe. In the same year, the value of oil and gas production was estimated at €32,067 million in the Mediterranean with a gross value added (GVA) of €22,679 million and total employment estimated at 398,510 jobs (Piante and Ody, 2015).

Today, in the Mediterranean region, the majority of offshore oil and gas exploration, exploitation activities and production are located in the Italian (Adriatic Sea), Spanish and Maltese waters (Kostianoy and Carpenter, 2018 and Francocci *et al.*, 2019), while the main offshore oil reserves (94%) are held by Libya, Algeria and Egypt (Piante and Ody, 2015).

Italy operates approximately 100 offshore installations located in the Adriatic and the Ionian Sea and in the Sicily Channel. The production of offshore oil and gas constitutes an important energy source of hydrocarbons in the country and is mainly focused on gas extraction and exploration. In 2012, offshore oil and natural gas production in the EU totalled approximately 60 million tons and 63 million tons of oil equivalent, with Italy contributing 0.83% and 8.06%, respectively (Piante and Ody, 2015 and Kostianoy and Carpenter, 2018).

In 2011, Spain had two installations in the Mediterranean Sea, and France and Malta reported no active offshore installations, but in the past, both countries have had drilling operations and Malta is expected to commence drilling activities in the foreseeable future (Piante and Ody, 2015).

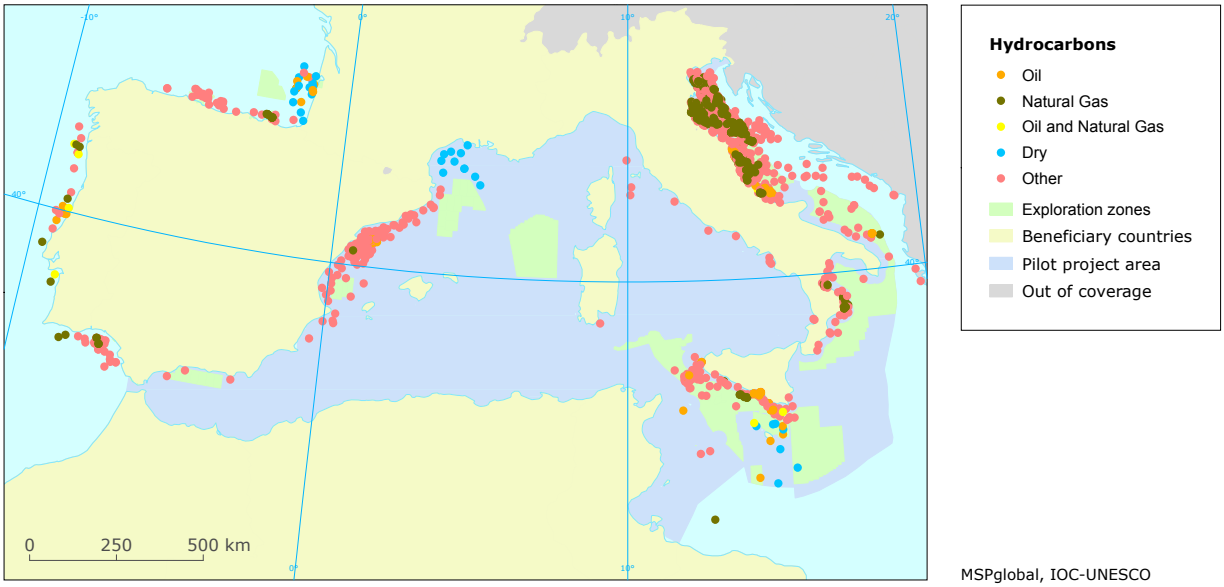

Figure 15
Oil and gas exploration and extraction in the Western Mediterranean.
(Data source: EMODnet and SIMWESTMED project).

Offshore oil platform off the south-eastern coast of Sicily in the Sicily Channel, Italy.
© Angelo Giampiccolo/Shutterstock.com.

Liquefied natural gas carrier crossing the Mediterranean Sea.
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In the southern shores of the Western Mediterranean, Libya holds one of the largest producing oil fields in the Mediterranean Sea, located 120 km north of its coast (the Bouri Offshore Field). The field reserves were estimated to contain 4.5 billion barrels in proven recoverable crude oil and 3.5 trillion cubic feet of associated natural gas, with an annual potential of production of 6 billion cubic feet (Kostianoy and Carpenter, 2018). Additionally, according to Piante and Ody (2015), Algeria holds important offshore oil reserves and in Tunisia, offshore oil and gas activities are taking place, although to a lesser extent.

IV.4.3. Challenges of offshore oil and natural gas production

The offshore oil and gas industry is developing its activity offshore and as such extending the human footprint to the depths of the ocean and increase potential interactions with the maritime transport sector, which may lead to conflicts of uses. Today, accidental spills from offshore platforms represent only about 3% worldwide, with the Mediterranean Sea share estimated at less than 1% of total oil pollution as the number of offshore oil and gas platforms is reduced compared to other regions of the world (Kostianoy and Carpenter, 2018). However, with the expected development of offshore oil and gas exploitation, this number might increase.

IV.5. Marine renewable energy

IV.5.1. Current status and future trends of marine renewable energy

In the Mediterranean, the Marine Renewable Energy (MRE) sector is still in its early stages of development. Twenty projects are under development in the Western Mediterranean where only one energy farm is operational: it is the tidal current energy farm in the Strait of Messina (Italy). Two wave energy and one tidal current energy farms are completed, both in Italy; and several projects are planned or in a pilot phase, the majority of which are wind (10) and wave power farms (6) concentrated in Italy (Ligurian Sea), France (Gulf of Lion) and in the Strait of Gibraltar (Figure 16).

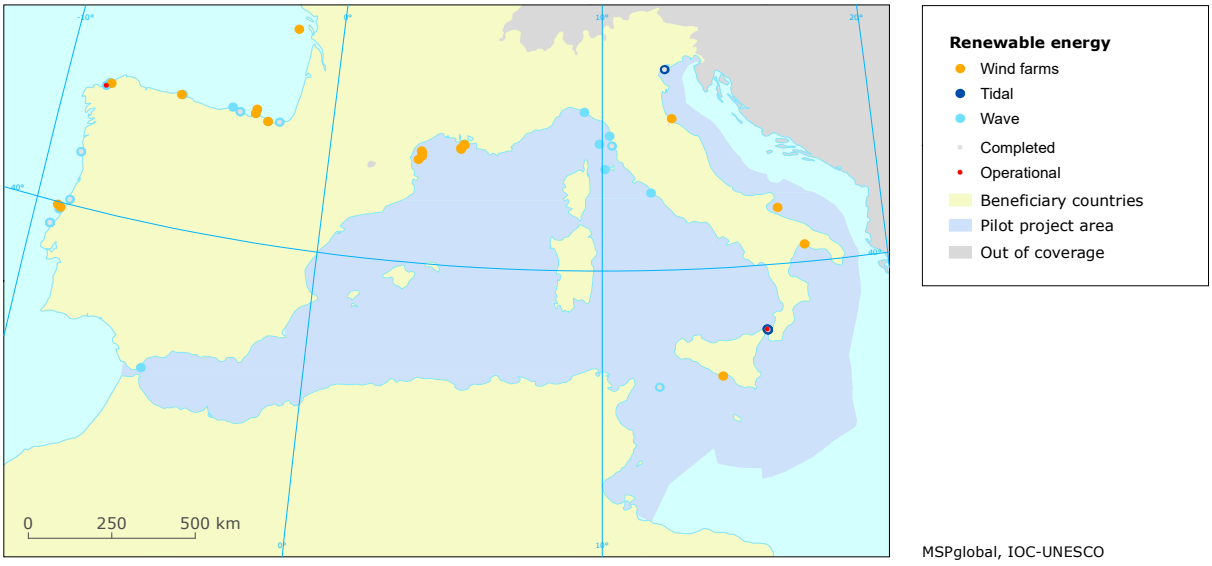

Figure 16
Offshore marine renewable energy in the Western Mediterranean.
(Data source: EMODnet).

Offshore wind farm.
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The development of tidal current energy in the Mediterranean is restricted to couple of areas that has an exploitation potential: the Strait of Messina, Strait of Gibraltar and Strait of Gallipoli. Despite the potential of these areas, the development of such facilities is limited due to both technological and non-technological limitations such as the heavy maritime traffics in such straits (Francocci *et al.,* 2019).

On the other hand, the Offshore Wind Energy (OWE) sector in the Mediterranean is expanding and is expected to grow rapidly. This is due to it being considered as the most promising source of renewable power in the region because of the region's high wind potential, but especially, considering the forecasted reduction in costs of up to 50% by 2021 (WWF-France, 2019 and PHAROS4MPAs, 2020). It is worth noting that the most promising OWE areas in the Mediterranean are located in the Western Mediterranean region and include: the Gulf of Lion (France), the Adriatic Sea, the straits between Sicily and Tunisia and Sicily and Malta, and the Gulf of Gabès (Tunisia) (WWF-France, 2019).

According to the Union for the Mediterranean (2017), by 2030 in the Mediterranean EU countries, the offshore wind energy is projected to generate up to 12 GW and around 40 GW by 2050, and in the southern and eastern Mediterranean region, it is expected to attain 21,967 TWh per year, accounting for 34 times more than northern countries.

IV.5.2. Challenges of marine renewable energy

Offshore wind energy provides a major promising solutions to reduce greenhouse gas emissions and mitigate the impacts of climate change as well as contributing positivly in the countries' ecnomy through th creation of jobs. However, its development may have potential negative environmental impacts. The offshore wind farms (OWF) lifecycle (installation, connection to the electrical grid by submarine cable, maintenance and eventual decommissioning) has the potential to adversely affect marine habitats and wildlife at different times in the lifecycle phases of an OWF, and with various strength in terms of duration and spatial extent (WWF-France, 2019).

During the construction phase, the benthic habitats and communities are likely to be harmed by the foundations of turbines and associated infrastructure, leading to habitat destruction and sediment suspension. The underwater noise emitted during the construction process might have a significant impact on marine mammals. During the OWF operational phase, bony fish and elasmobranchs (sharks and rays) can be affected by the noise of the turbines or by electromagnetic fields generated by cables transporting energy from the turbines to shore. Additionally, the OWFs can have a significant impact on birds by causing the displacement of waterbirds and posing a collision risk for all birds flying over sea (WWF-France, 2019).

It is important to note that, while the impact of one wind farm on a specific wildlife population may be insiginificant, it is feared that the cumulative effects of several OWFs over space and time would cause a decrease in wildlife populations. Hence the importance of adopoting marine spatial planning as its processes allow for assessing these cumulative effects coupled with the pressures generated by other maritime sectors while taking a precautionary approach (WWF-France, 2019).

IV.6. Maritime transport and ports

IV.6.1. Current status and future trends of maritime transport and ports

Despite covering an area of only 0.82% of the world's Ocean surface, thanks to its location between three continents (Africa, Asia and Europe) the Mediterranean Sea is one of the busiest seas in the world harvesting 15% of the global shipping activity, 20% of seaborne trade, 10% of container traffic and more than 200 million passengers (Eco-Union and Plan Bleu, 2017 and Randone *et al.,* 2019b).

This activity generates a very high density of maritime traffic, concentrated mainly in its Western and Aegean-Levantine Sea basins and largely dominated by international fluxes rather than intra-Mediterranean ones, the latest representing less than a quarter of the entire maritime traffic within the sea (Piante and Ody, 2015). In the Western Mediterranean, the traffic intensity is particularly localised in the Strait of Gibraltar, the Strait of Sicily and in the northern Adriatic Sea. The shipping traffic liaise more than 600 commercial ports and terminals, the most important ones in the Western Mediterranean are Algeciras and Valencia (Spain), Marseille (France), Genova and Trieste (Italy) and Tanger Med (Morocco), the latest considered as one of the two leading African ports in the Mediterranean, the second being port Said in Egypt (Randone *et al.,* 2019b and UNCTAD, 2019). In the coming years, the shipping activity in the region is expected to increase by 4% annually, both in number of routes and traffic intensity (PHAROS4MPAs, 2020).

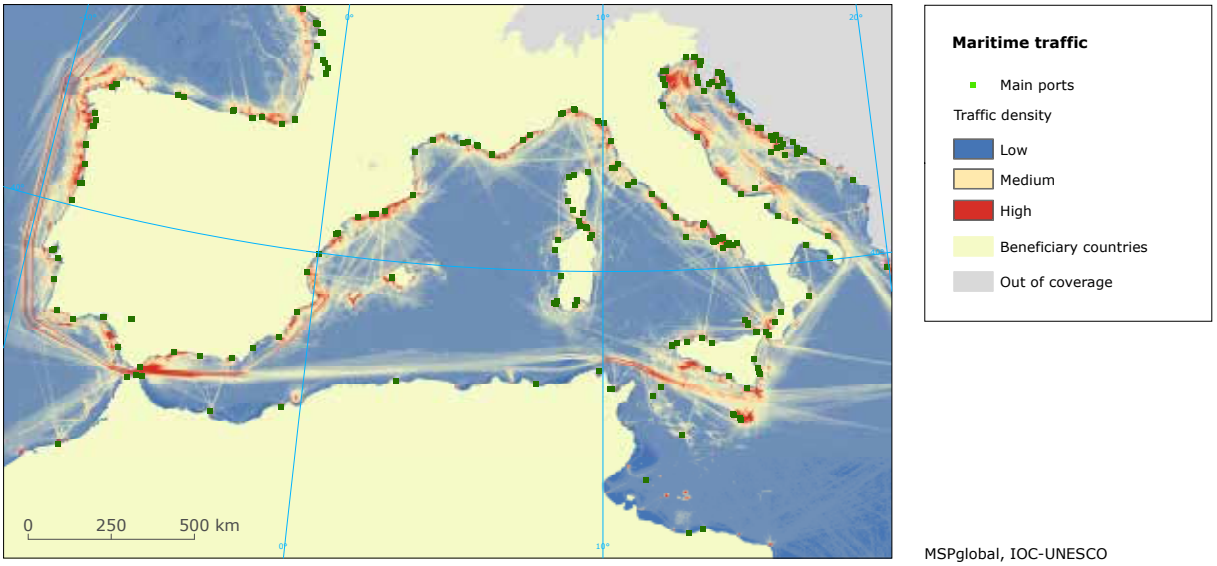


Figure 17
Maritime traffic and main ports in the Western Mediterranean.
(Data source: EMODnet; Moroccan Directorate of Ports and Public Maritime Domain).

Aerial view of the port and the Bay of Algiers, Algeria.
© Leonid Andronov/Shutterstock.com.

The transport of goods in the Mediterranean is predominated by liquid bulk transport of energy (crude oil) and non-bulk products through container shipping (Randone *et al.,* 2019b and PHAROS4MPAs, 2020). In 2019, container port traffic reached 811 million twenty-foot equivalent units (TEUs) worldwide representing a growth of 2% from the precedent year. A similar increase of percentage was reflected in the Western Mediterranean between 2018 and 2019 where 43 million TEUs of containers were handled in its ports in 2019. In the region, Spain led the Western Mediterranean countries with 17 million TEU, followed by Italy (10 million), Morocco (6 million) and France (5 million) (Figure 18 and Figure 19) (UNCTAD, 2020).

In addition to non-bulk products, liquid bulk goods (energy and chemical products and oil and gas) are a major part of the Mediterranean's maritime transport where around 18% of global exports of crude oil by sea were estimated to happen within or across the Sea in order to distribute the oil produced in North Africa, the Persian Gulf and the Black Sea to Europe and the USA (Piante and Ody, 2015 and Randone *et al.,* 2019b).

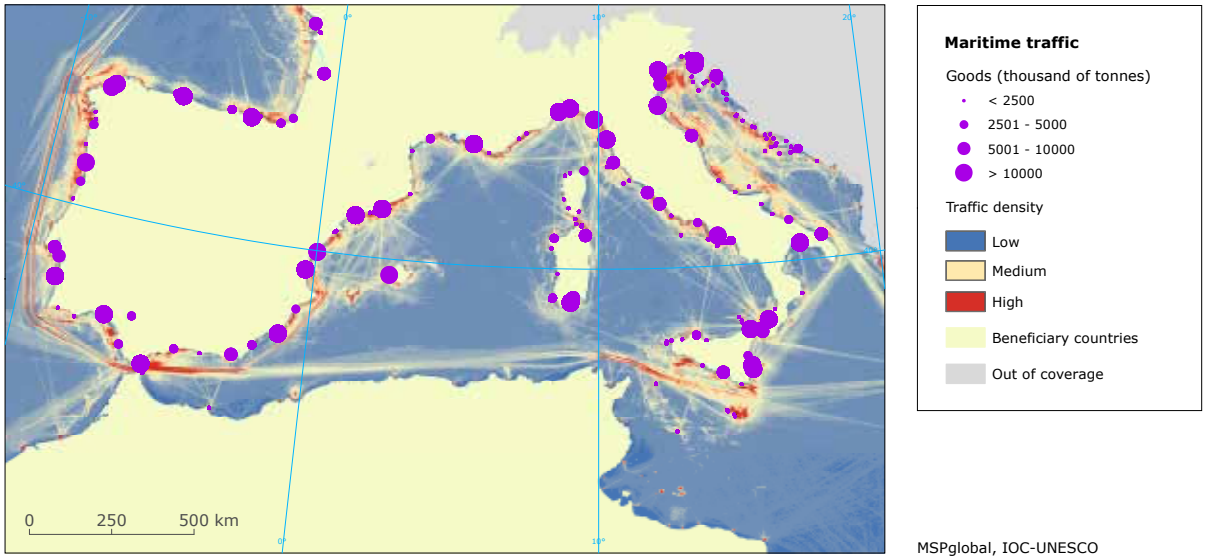


Figure 18
Transport of goods in the Western Mediterranean.
(Data source: EMODnet; Moroccan Directorate of Ports and Public Maritime Domain and the Tunisian National Institute of Statistics).

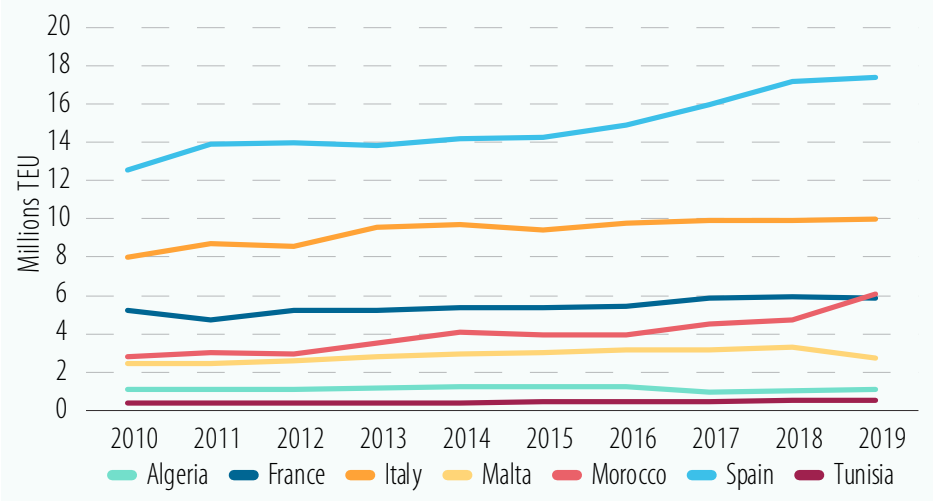
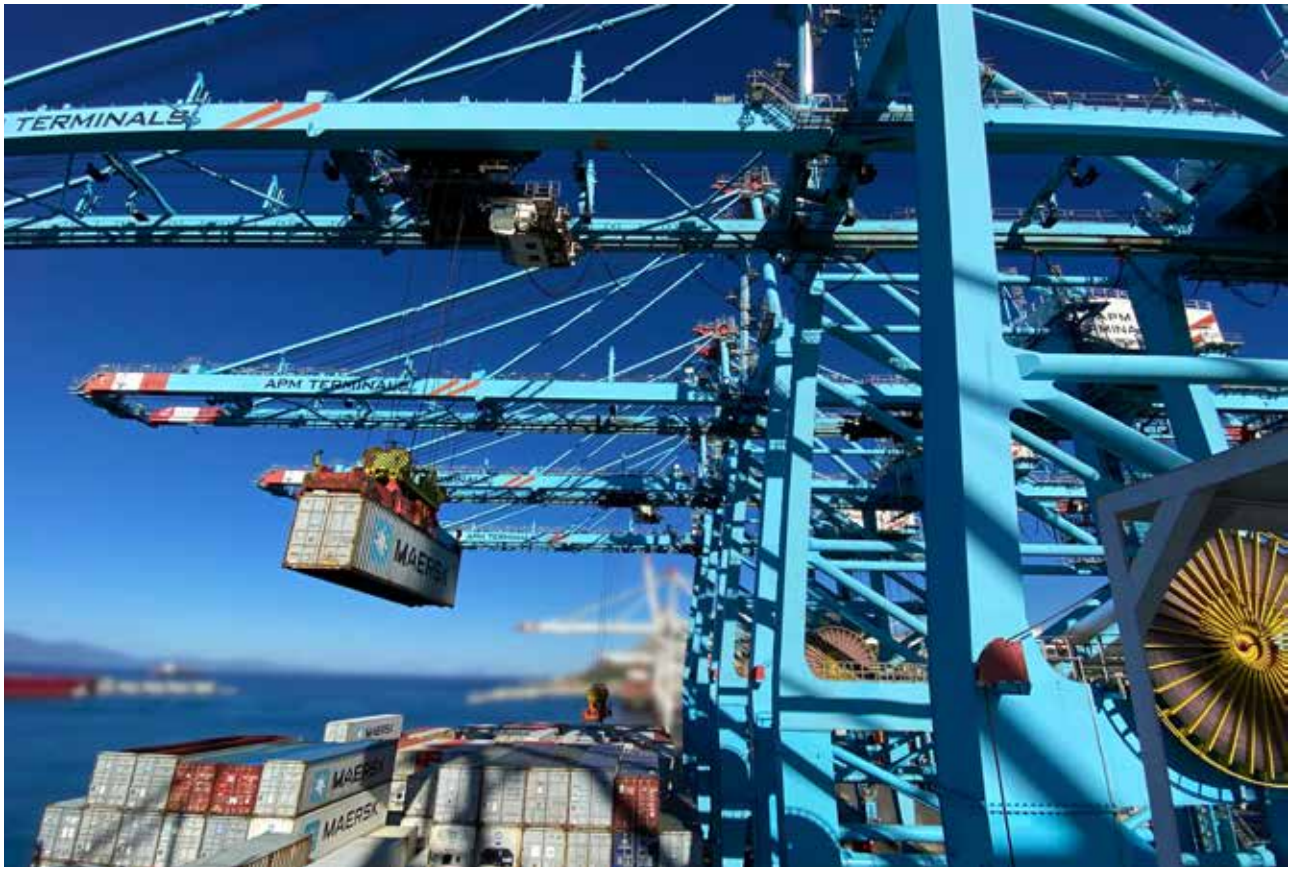


Figure 19
Container port traffic in twenty-foot equivalent units in the Western Mediterranean between 2010 and 2019.
(Source: adapted from UNCTAD, 2020).



Ship-to-shore crane in the container terminal of Tanger Med port, Morocco.
© asshpek/Shutterstock.com.

Passenger transport, although affected by seasonality, represents a major component of maritime traffic in the Mediterranean Sea due to the presence of many islands (Randone *et al.*, 2019b). In 2019, 131 million passengers embarked or disembarked in an EU Western Mediterranean ports accounting for 31% of the total EU passenger seaborne traffic (419 million in 2019). The main ports where passengers embark and disembark in the region are in Italy (66% of total passengers) and in Spain (16% of total passengers) (Figure 20 and Figure 21) (Eurostat, 2020).

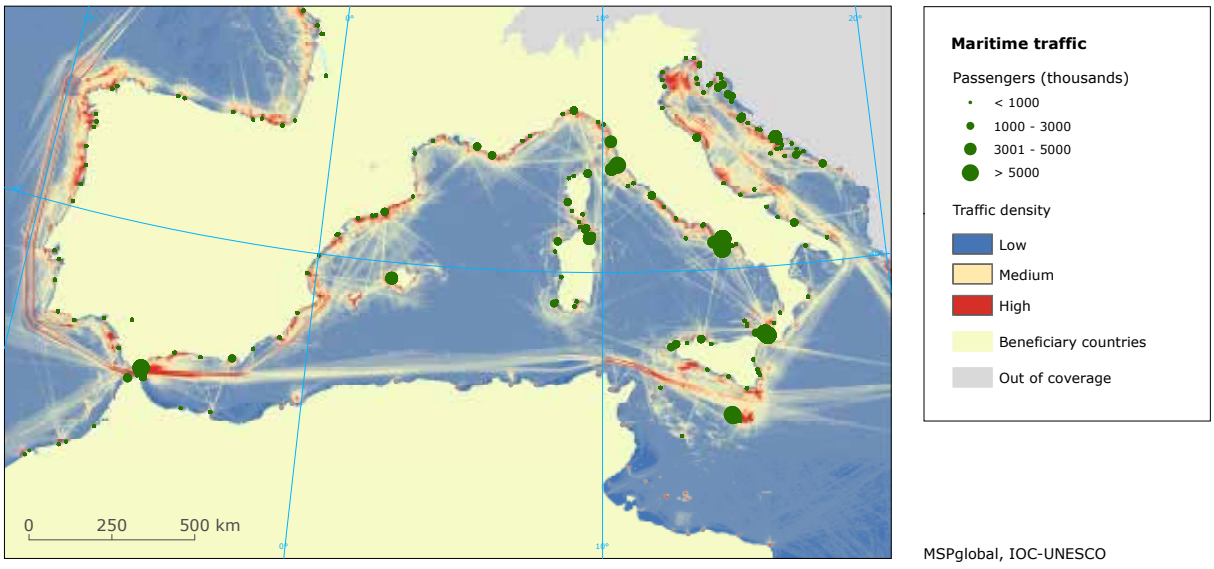


Figure 20
Passenger traffic in the Western Mediterranean.
(Data source: EMODnet and Moroccan Directorate of Ports and Public Maritime Domain).

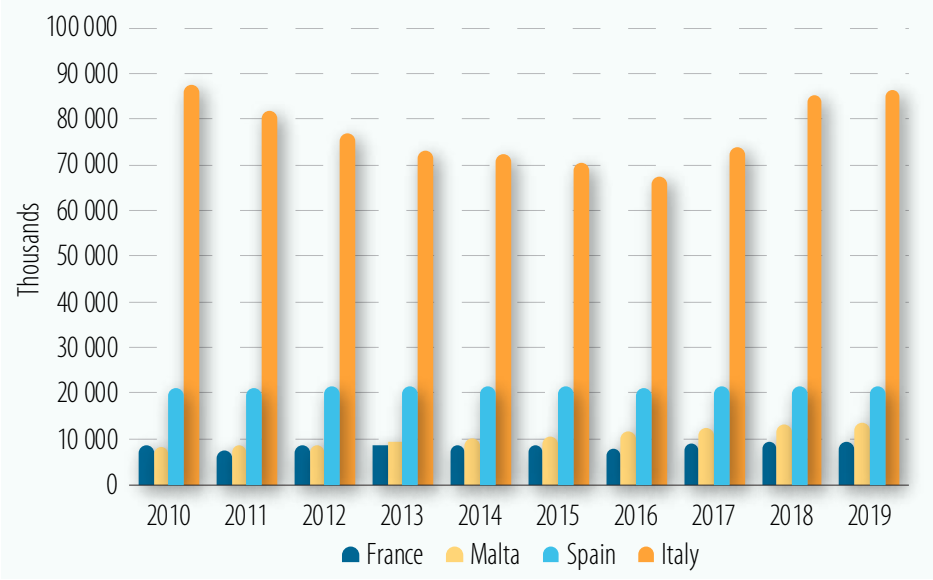


Figure 21
Passenger traffic in the EU Western Mediterranean ports between 2010 and 2019, only ports in the Mediterranean coasts.
(Source: adapted from Eurostat, 2020).

IV.6.2. Socio-economic value of the maritime transport and ports

In the Mediterranean, the maritime transport sector generates total revenues surpassing €70 billion accounting for 5% of the total revenues worldwide. This revenues produce a GVA of €27 billion and employs directly around 550,000 people in the Mediterranean countries (Randone *et al.,* 2019b and PHAROS4MPAs, 2020). The revenues of the sector in the Western Mediterranean accounts for over half of the its total revenues in the Mediterranean, or €40 billion generating thus €12 billion of GVA. In the same region, the sector creates more than 230,000 direct jobs accounting for 42% of the entire jobs created in the sea basin (Plan Bleu 2014).

IV.6.3. Challenges of the maritime transport and ports

With the growth of the maritime sector, environmental impacts pressures will increase, such as rising CO_2 emissions, chemical and noise pollution, collisions with large cetaceans and the introduction of non-indigenous species. Therefore, in order to identify, implement and enforce measures to avoid the impacts of the maritime transport sector on ecosystems, better planning of the seas is critical.

Passenger cars embarking in the ferry linking Gozo and Comino islands, Malta.
© Ruben Bugeja Photography/Shutterstock.com.

IV.7. Coastal tourism

IV.7.1. Current status and future trends of tourism

The Mediterranean is the world's leading tourist destination, accounting for one-third of the world's tourists. In 1970, 58 million international tourist arrivals (ITAs) were recorded in the Mediterranean countries; by 2014, this number had increased five times reaching 313 million international arrivals (Union for the Mediterranean, 2017). In the next decade, the tourism sector is expected to grow by 2.9% per annum and the ITAs are expected to increase by 60%, reaching more than 500 million arrivals in 2030 (Piante and Ody, 2015 and PHAROS4MPAs, 2020).

In the Western Mediterranean, while most Mediterranean countries have experienced a large economic growth in the sector, France, Spain and Italy remain the three destinations attracting the biggest number of tourists and therefore experiencing the vast majority of economic growth (Figure 22) (Piante and Ody, 2015 and Eco-Union and Plan Bleu, 2017). In fact, in 2018 the three countries have attracted 96% of foreign visitors arriving in the western Mediterranean region accounting respectively for 47% in France, 28% in Spain, and 21% in Italy. The total arrival of tourists in the western Mediterranean in the same year amounted to 448 million including nationals residing abroad, an increase of 19% since 2009 (Figure 23) (UNWTO, 2020).

Panoramic view of the city and port of Málaga, Spain.
© Grisha Bruev/Shutterstock.com.

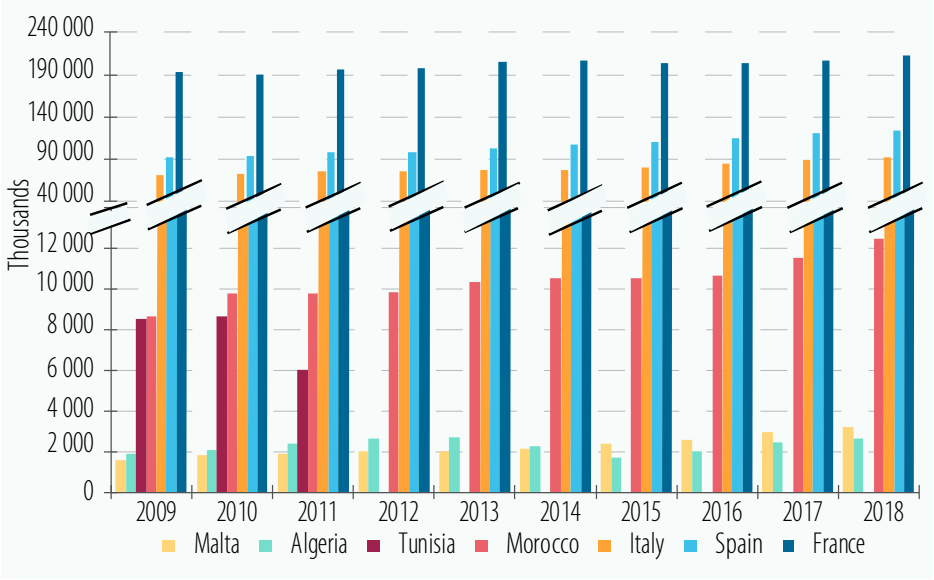


Figure 22
Total arrivals of tourists at national borders of the Western Mediterranean countries over the period 2009-2018 (by thousands).
(Source: adapted from UNWTO, 2020).

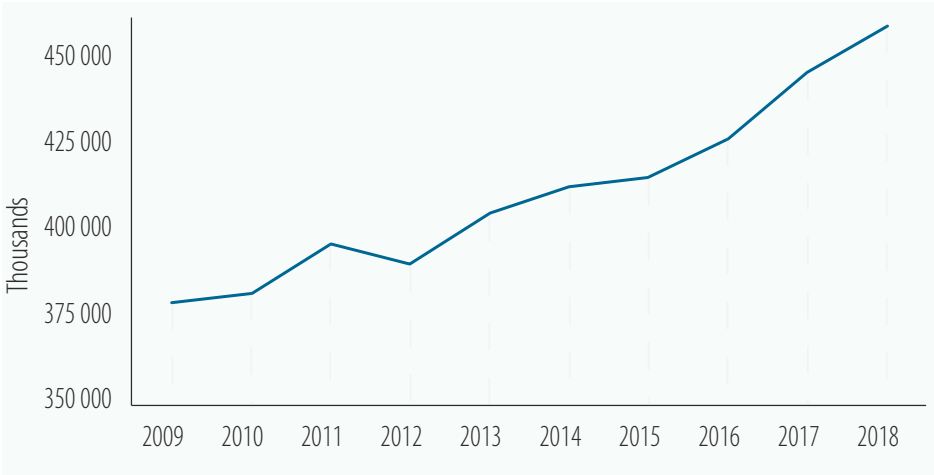


Figure 23
Evolution of the arrivals of tourists at national borders of the Western Mediterranean countries over the period 2009-2018 (by thousands).
(Source: adapted from UNWTO, 2020).

The inbound market grew in the Western Mediterranean region by 36% between 2009 and 2018 with France taking the lead (8.9 million of non-residents overnight stays in 2018), growing by 16%. The Spanish market (8.2 million) grew by 59% and Italy (around 6 million) grew by 42% while Morocco, Tunisia, Algeria and Malta recorded a total of 2.3 million of non-residents overnight stays in the same year and followed the same trend of growth (Figure 24 and Figure 25) (UNWTO, 2020).

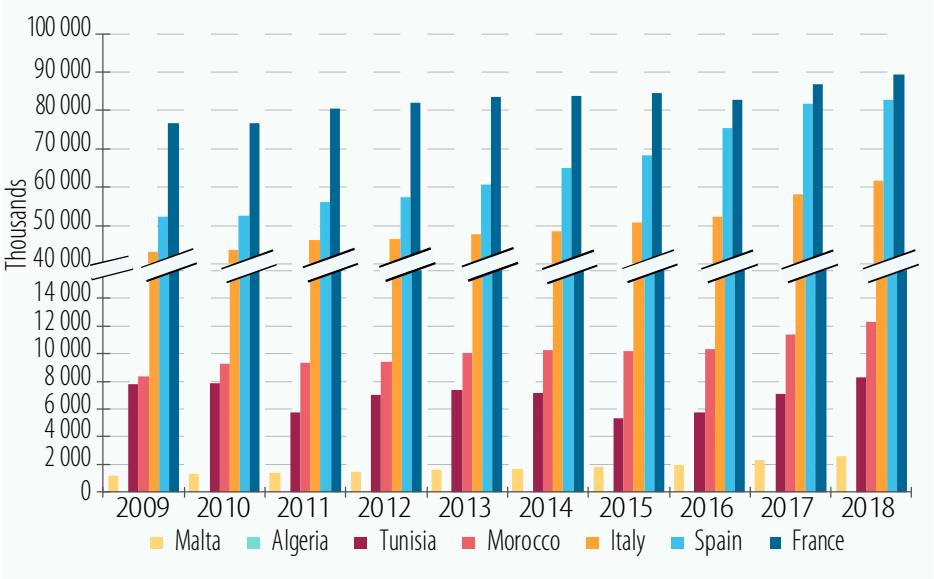


Figure 24
Overnight stays by international tourists in the Western Mediterranean countries over the period 2009-2018 (by thousands).
(Source: adapted from UNWTO, 2020).

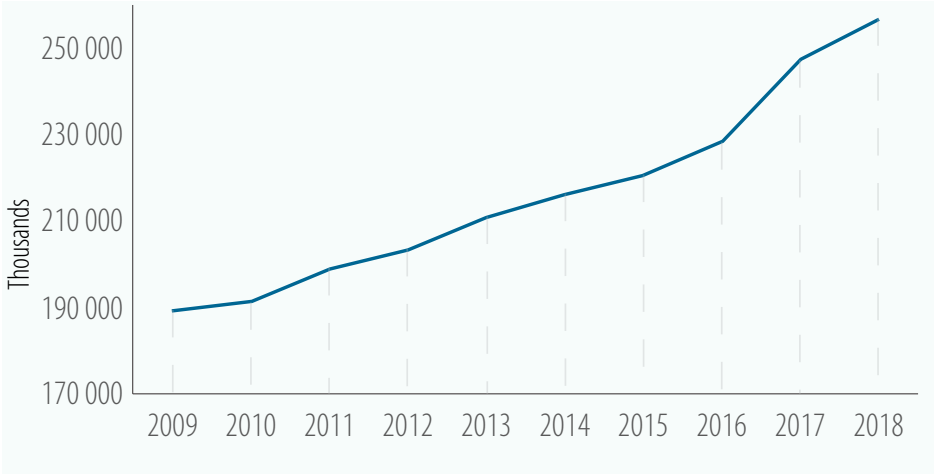


Figure 25
Evolution of the overnight stays by international tourists in the Western Mediterranean countries over the period 2009-2018 (by thousands).
(Source: adapted from UNWTO, 2020).

IV.7.2. Socio-economic value of tourism

The tourism industry has been a major player in the Mediterranean economies, with countless economic and social benefits. Its total contributions to national economies in the Mediterranean are high. In the past two decades, the contribution of the sector to gross domestic product (GDP) has steadily increased by 60% in the Mediterranean countries. In fact, the Union for the Mediterranean (2017) states that in 2015 the direct contribution of the tourism sector to the countries' GDP was estimated at USD 354 billion or 4.5% of the region's GDP, and the total contribution (direct, indirect and induced) at USD 901 billion or 11.6% of the region's GDP; and with the foreseen growth of the sector, this number is expected to reach 12.5% of the region's GDP by 2026 (USD 923 billion). During the same year, coastal and inland tourism represented 11.5% of the total employment in the Mediterranean economies, creating some 19.8 million jobs, of which 7.8 million were direct and this number is projected to grow to reach 12.4% of total employment in 2026 (Eco-Union and Plan Bleu, 2017 and Union for the Mediterranean, 2017).

IV.7.3. Challenges of tourism

With the growing number of tourists visiting the Mediterranean region, the tourism sector is generating multiple pressures on local ecosystems, inducing land and biodiversity losses due to the building of tourism facilities. The demand for natural resources (e.g. water, food and fossil fuels) has greatly increased. Marine and beach litter has increased as well in the region due to tourism, the sector is responsible of 52% of marine and beach litter in the EU Member States (Piante and Ody, 2015). In the last decades, air pollution and greenhouse gas emissions have increased considerably in the Mediterranean due to the increased air traffic and the fast-growing tourism facilities (Union for the Mediterranean, 2017).

Panoramic view of the archaeological site of Carthage, a UNESCO World Heritage Site in Tunis, Tunisia.
© Valery Bareta/Shutterstock.com.

IV.8. Other activities

IV.8.1. Defence

Munitions discarded on the seabed represent a major concern globally, these can include several sorts of weapons such as unexploded bombs, including chemical weapons dumped after World Wars I and II. The munitions can endanger the marine environment, impact human health and obstruct marine activities and marine spatial planning processes (Maritime Forum, 2019).

Since 1976, the dumping from ships and aircraft has been regulated following the adoption of the Protocol for the Prevention of Pollution of the Mediterranean Sea (UNEP/MAP, 2007). Nevertheless, munitions (shotgun shells and wadding) remain one of the main types of marine litter (Figure 26) (UNEP/MAP, 2015). Despite the effort of the Coordination Unit of the UNEP/MAP to assess the situation of dumpsites and other areas of concern in the Mediterranean Sea, it was recognised that, due to a failure to maintain appropriate recordings, sites remained uncharted and charted sites remained unspecified in terms of submerged ammunition type and quantity (Frey *et al.*, 2019).

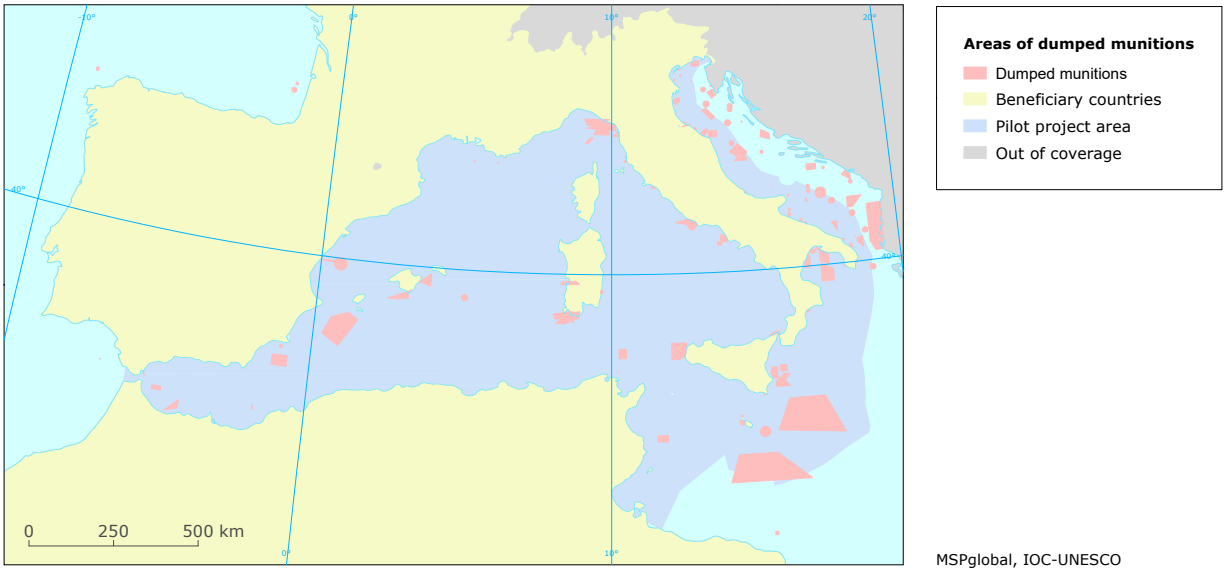


Figure 26
Areas of dumped munitions in the Western Mediterranean.
(Data source: EMODnet).

Although no data on military activities and defence exists, the Western Mediterranean countries have been cooperating together since 1990 on common security challenges of the region through the 5+5 Defence Initiative. The initiative brings together the ten states of the Western Mediterranean: Algeria, Libya, Mauritania, Morocco and Tunisia from the southern shore and France, Italy, Malta, Portugal and Spain from the northern shore. The initiative is recognised as an active multilateral forum for security cooperation with work focused in maritime surveillance, air safety, the contribution of the armed forces to civil protection and formation and research (5+5 Defence Initiative, 2020).

IV.8.2. Deep-sea mining

Deep-sea mining is an emerging sector in the Mediterranean region and is still in its exploratory stages. However, in the upcoming decade, the sector will grow substantially surpassing traditional ones as global demand for metals and minerals for use in electronic devices is increasing. By 2030, 10% of the world's minerals (e.g. cobalt, copper, zinc) is expected to be extracted from the ocean (Piante and Ody, 2015). In the Western Mediterranean, there are no on-going deep-sea mining operations; however, potential areas for seabed mining have been identified in its northern part in France and Spain (Piante and Ody, 2015).

The development of deep-sea mining activities poses considerable uncertainty in terms of impacts on marine ecosystems and potential space conflicts with other marine activities such as oil and gas exploration and extraction, and the development of wind farms.

IV.9. Cumulative pressures

Marine activities in the Mediterranean Sea produce a variety of stressors that may have an impact on populations, communities and ecosystems. These stressors may interact with each other and with the ecosystem, generating even greater direct and indirect cumulative pressures.

In the Western Mediterranean, very high cumulative pressures are identified in its northern shore with the highest concentrations in the Adriatic Sea, the Strait of Sicily and the Strait of Gibraltar (Figure 27). We suggest that these areas may represent good candidates for management and protection measures as well as good case studies to further the research on how these threats accumulate and interact to affect marine species and ecosystems. It is worth noting that the low cumulative pressures assessed in the southern shores of the Western Mediterranean region pertain to the lack of data on existing maritime activities.

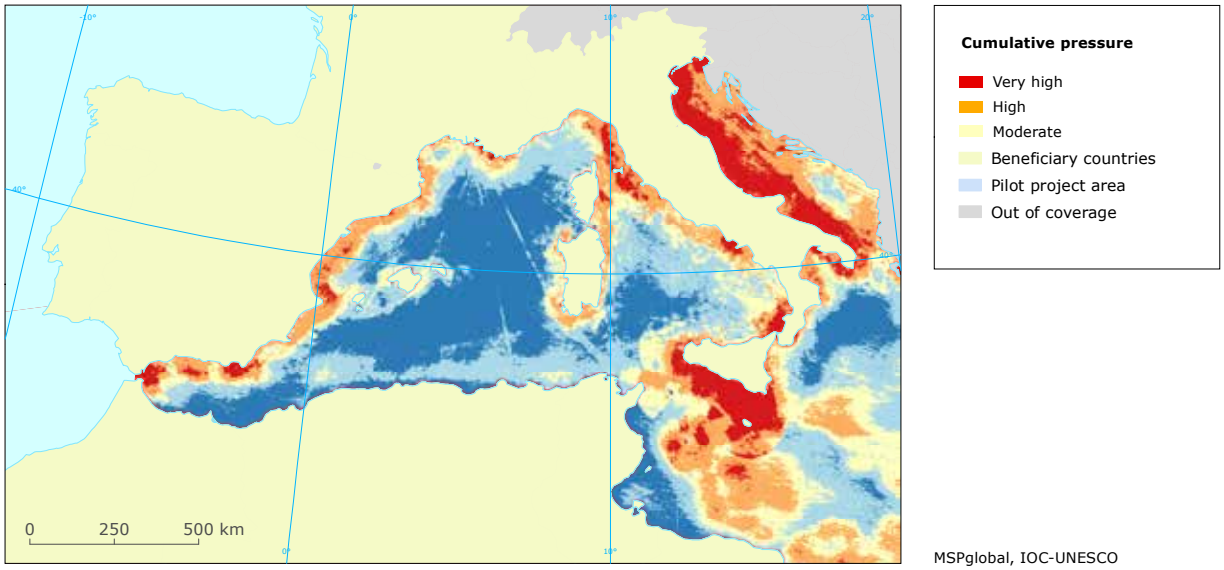


Figure 27
Cumulative pressures of marine activities in the Western Mediterranean.
© MSPglobal, IOC-UNESCO.

V. Conflicts and compatibilities

V.1. Introduction

Following the analysis, key maritime sectors in the Mediterranean Sea will record positive growth in the coming decade, except for professional fisheries that might decrease due to the high pressures on fish stocks. The combined positive growth will create competition over the marine space, increase conflicts of uses between maritime activities and their environmental impacts leading to further deterioration of the ecosystems of the Mediterranean Sea. In this context, we will address in this section the existing current conflicts of use in the Western Mediterranean following a regional analysis.

The section will address the environment and human uses conflicts (environment-uses), the conflicts between human uses (use-use), and highlight the compatibilities of uses to identify multi-use opportunities in the sea basin. It is worth emphasising that the conflict analysis was conducted to the possible extent considering data availability and existing data gaps Annex 1). Therefore, it is important to consider that the absence of conflicts of use in the southern shores of the Western Mediterranean is driven by the lack of data on the existing maritime activities.

V.2. Environment-use and use-use conflicts

In the Western Mediterranean, the main and only conflict identified between maritime uses and the environment is occurring between maritime traffic and the priority areas for the conservation of cetaceans. According to the matrix developed by IOC-UNESCO (2009), the conflicts between maritime traffic and marine reserves with strict protection are considered as use-use conflict; however, in a marine spatial planning process following an ecosystem-based approach, the conflict analysis should go beyond the borders of defined marine protected areas to consider important habitats based on their natural distribution. Therefore, the first analysis is considered an "**environment-use**" conflict whose results will be more conservative than the following one analysing the conflict between maritime traffic and marine protected areas. Subsequently, two additional "**use-use**" conflicts were identified and analysed in the region between offshore oil and gas exploitation and marine protected areas and between aquaculture facilities and marine protected areas.

V.2.1. Conflict analysis between maritime traffic and the priority areas for the conservation of cetaceans

For this analysis, areas of high biodiversity of marine mammals and ecologically and biologically significant areas were first identified. This data was coupled with the vessel density annual average from 2017 calculated from automatic identification systems signal data in hours (Figure 28). Finally, the areas of potential conflicts were quantified by looking at the spatial overlap between areas with significant pelagic values, and maritime traffic presence.

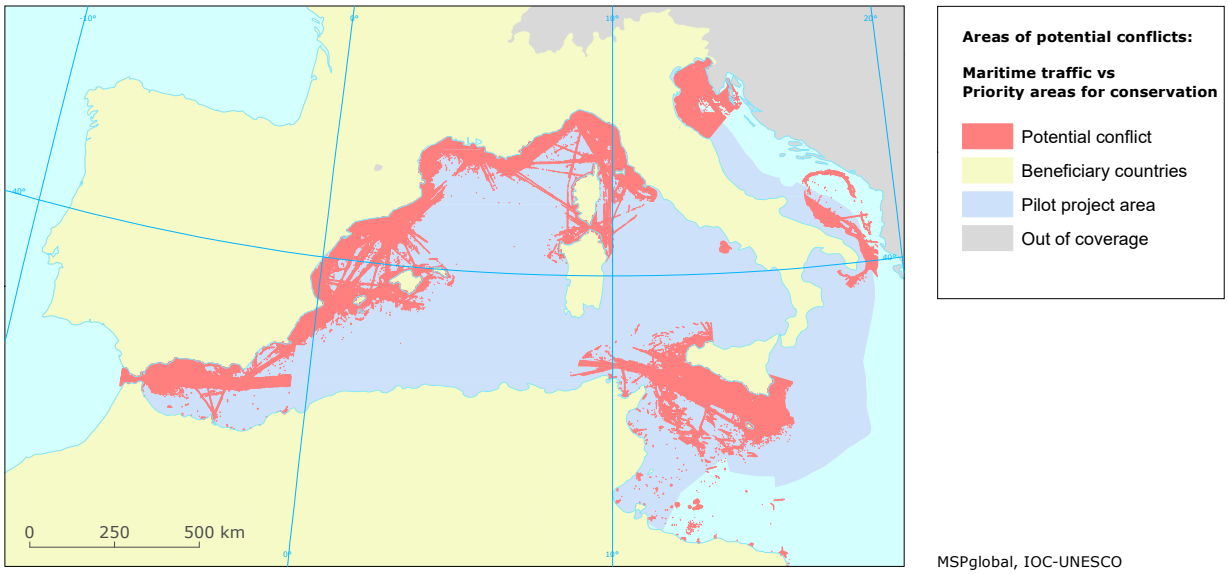


Figure 28
Analysis of potential conflicts between maritime traffic, and priority areas for the conservation of cetaceans in the Western Mediterranean.
(Data source: EMODnet; MAPAMED and Convention on Biological Diversity).

The areas of potential conflicts between maritime traffic, and priority areas for the conservation of cetaceans in the Western Mediterranean were identified (from East to West) in the northern and southern part of the Adriatic Sea, the Strait of Sicily, the Strait of Bonifacio, along the coasts of all northern states (France, Italy and Spain) and within the Strait of Gibraltar.

Further conflicts could also be expected between maritime traffic and marine protected areas with conservation objectives related to the pelagic environment in the Western Mediterranean. These areas were mostly identified in the Ligurian Sea, the Strait of Bonifacio, in the Balearic Sea and around Malta (Figure 29).

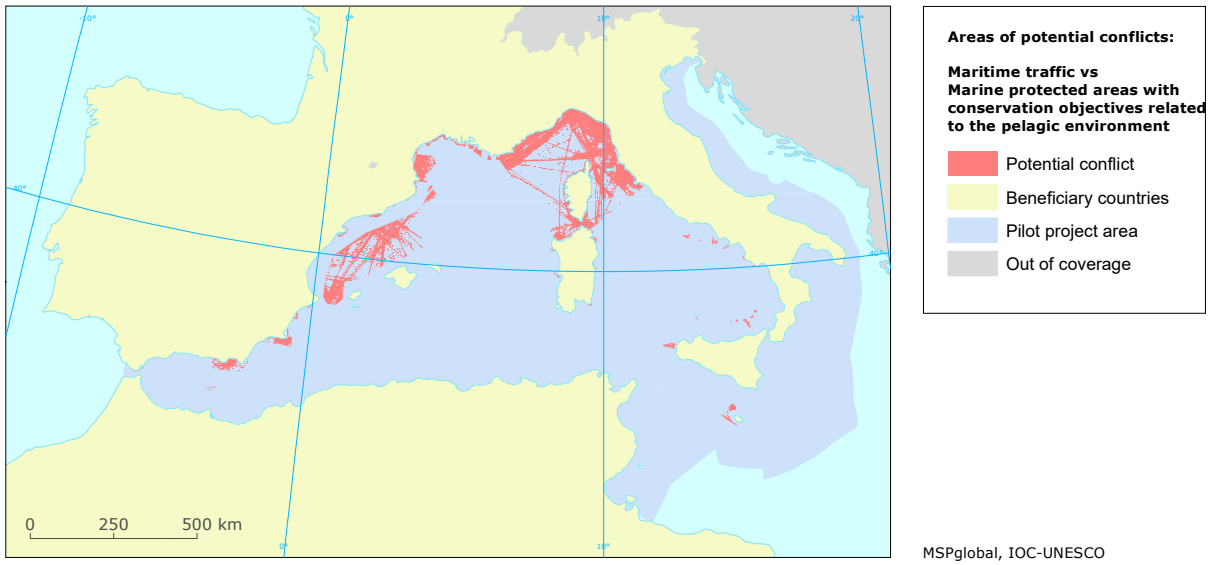
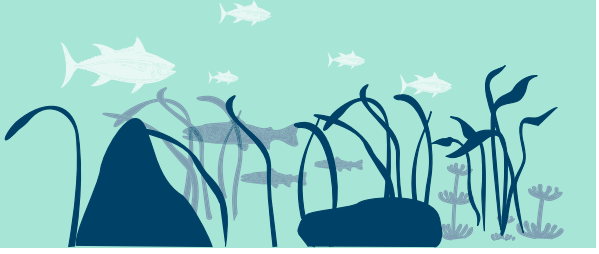


Figure 29
Areas of potential conflicts between maritime traffic and marine protected areas with conservation objectives related to the pelagic environment in the Western Mediterranean.
(Source: EMODnet; MAPAMED and Convention on Biological Diversity).

In the Western Mediterranean, the main potential **conflict** identified between maritime uses and the environment **concerns maritime traffic** and **the priority areas for the conservation of cetaceans**.



This second analysis identified interactions between maritime uses using a less conservative approach than the previous one. Marine protected areas with conservation objectives related to the pelagic environment were first identified following the analysis conducted by the SIMWESTMED Project according to Giffon *et al.* (2018). This data was coupled with the vessel density annual average from 2017 calculated from automatic identification systems signal data in hours. The areas of potential conflicts were quantified by looking at the spatial overlap between the two maritime uses.

V.2.2. Conflict analysis between offshore oil and gas exploitation and marine protected areas

For this analysis, marine protected areas were first identified and coupled with the offshore oil and gas exploitation platforms operating in the Western Mediterranean. The areas of potential conflicts between the two uses were quantified by looking at the offshore oil and gas platforms inside and outside the marine protected areas.

Although numerous exploitation sites exist in the Western Mediterranean – identified mainly in the Adriatic Sea and in the south of Sicily (Italy) – only three sites were identified within marine protected areas with potential effects on the marine environment. These sites were localised in the Ionian Sea (Italy), in the Gulf of Cadiz (Spain) and in Malta (Figure 30).

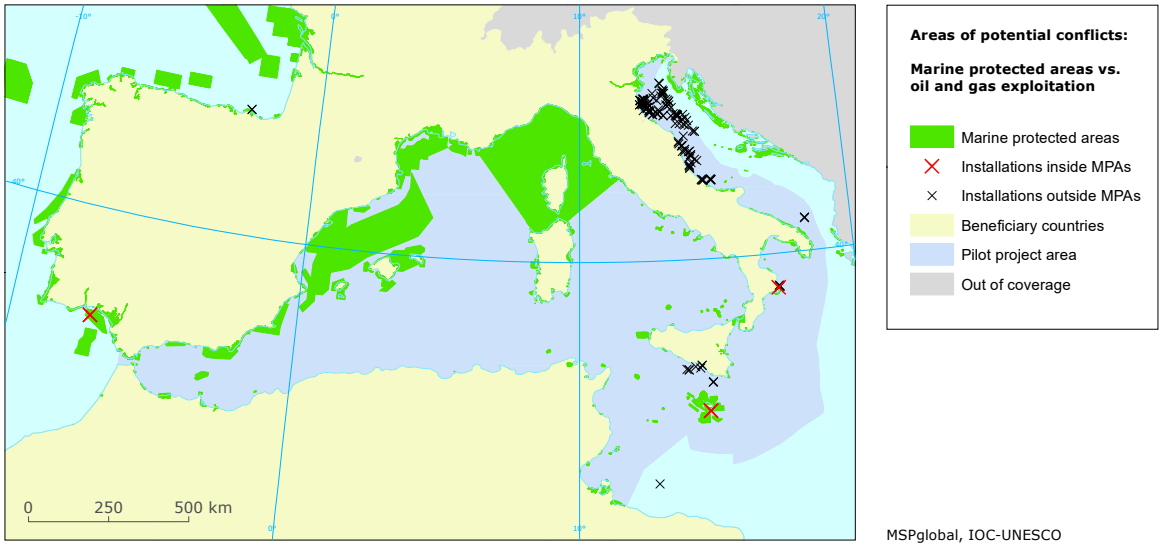


Figure 30
Areas of potential conflicts of use between offshore oil and gas exploration and MPAs in the Western Mediterranean.
(Data source: EMODnet, Protectedplanet.net and the Spanish Ministry for the Ecological Transition and the Demographic Challenge).

Although no offshore oil and gas exploitation sites were identified in the southern Mediterranean shores due to the lack of public data, hydrocarbon drilling activities on the shores of Algeria exists and have a substantial impact on marine ecosystems, in addition to potential conflicts that are expected to arise in the future between the existing oil and gas production facilities, future offshore wind farm installations, and the growing maritime traffic (Benabdi, 2019). In Tunisia, offshore exploration and exploitation activities are skyrocketing and currently, some twenty offshore oil platforms are in operation or being drilled (Le Figaro, 2011).

V.2.3. Conflict analysis between aquaculture and marine protected areas

To analyse the potential conflicts between aquaculture activities and marine protected areas, MPAs were first identified and coupled with the data on aquaculture facilities operating in the Western Mediterranean. The areas of potential conflicts were quantified by identifying the aquaculture facilities inside and outside the marine protected areas.

The analysis shows that aquaculture facilities within marine protected areas outnumber the ones outside them in all northern countries (France, Italy, Malta and Spain) and to a lesser extent in Morocco (Figure 31). No areas of potential conflicts of use were identified in Algeria or Tunisia in this analysis due to the lack of public data on the aquaculture facilities.

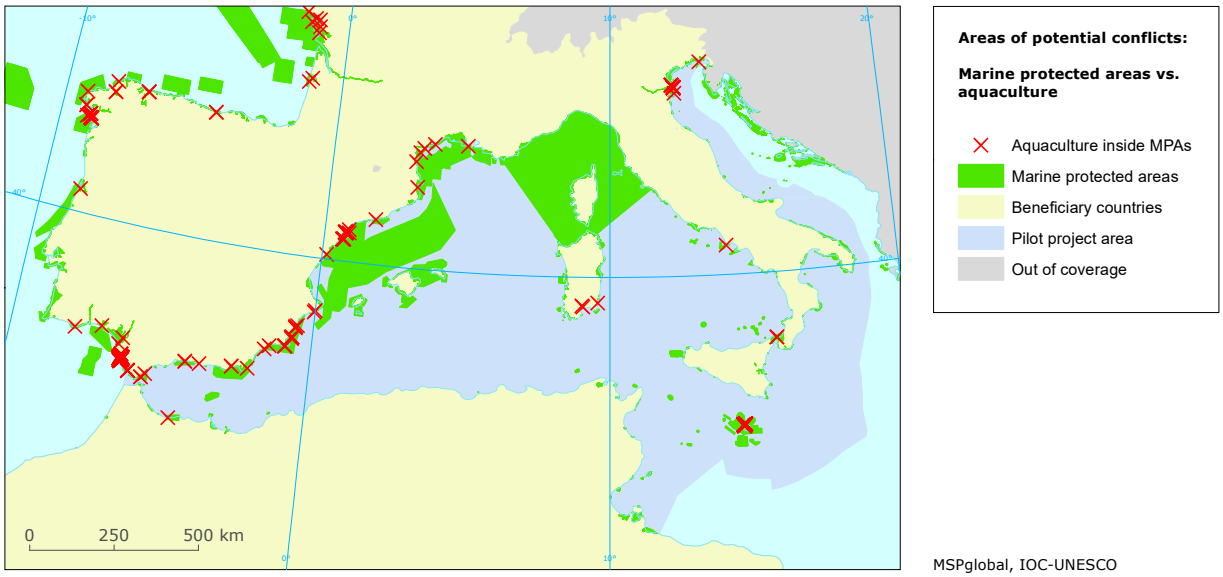


Figure 31
Areas of potential conflicts of use between aquaculture and MPAs in the Western Mediterranean.
(Data source: EMODnet, Protectedplanet.net, the Spanish Ministry for the Ecological Transition and the Demographic Challenge and the Moroccan National Agency for the development of Aquaculture).

V.3. Compatibilities

The compatibility of uses in the marine environment space can take a multitude of forms and offer a wide variety of benefits to the communities and the environment. In the Western Mediterranean Sea, following our regional analysis and based on the analysis of current conditions and compatibility of maritime uses of the coastal and marine environment, a second study was performed to analyse future conditions and scenarios for marine spatial planning and blue growth opportunities in the Western Mediterranean.

In this study, three scenarios for 2030 for the Western Mediterranean were developed: a scenario focused on conservation (conservationist scenario), a second projecting current trends of maritime activities to the future (trend scenario) and the last scenario where conflicts are minimised and blue economy strategies are followed (integrated scenario). The last scenario analyses the interactions of uses and identifies areas of potential compatibilities between uses (co-location areas).

In addition to the co-location areas identified in the regional study, Przedrzymirska *et al.* (2018) have identified ten already existing compatibilities of uses in the EU Western Mediterranean countries. The main ones are combinations between the fisheries activities, tourism and environmental protection, already in place in all four countries; between aquaculture and tourism activities in Malta and Italy; and between aquaculture activities and environmental protection in Malta and Spain. The combination of tourism activities, underwater cultural heritage and environmental protection exists only in Italy, and could potentially be established in Malta and Spain (Table 4). Potential compatibilities of uses with a high probability of establishment exist mainly in Italy with three identified uses combinations where at least one of the uses is in place are between oil and gas activities and renewable energy facilities; between oil and gas activities and tourism and aquaculture and between aquaculture and environmental protection.

Table 4
Existing and potential uses combinations in Spain (ES), France (FR), Italy (IT) and Malta (MT) analysed within the framework of the MUSES Project.

Multi-uses combinations in the EU Western Mediterranean countries				
	ES	FR	IT	MT
1. OW & Aquaculture		*		
2. Aquaculture & Tourism			E	
3. Fisheries & Tourism & Environmental Protection	E	E	E	
4. UCH & Tourism & Environmental Protection			E	
5. OW & Environmental Protection				
6. Wave & Aquaculture				
7. O&G & Renewables				
8. O&G & Tourism & Aquaculture				
9. Aquaculture & Environmental Protection				

(Source: adapted from Przedrzymirska et al., 2018).

Legend: Blue: existing (on going multi-uses in the real environment is indicated with the E letter), including pilot/test trials in the real environment, past and on-going ones. **Orange:** potential multi-uses with at least one of the uses already in place. **Yellow:** potential multi-uses with none of the uses already in place. * **OW** devices were tested in France. **UCH:** underwater cultural heritage; **O&G:** oil and gas; **OW:** offshore wind.

Cala Mesquida beach found within a Natural Area of Special Interest, Palma de Mallorca, Balearic islands, Spain. © Maurizio Milanesio/Shutterstock.com.

VI. Conclusions and recommendations

The Mediterranean Sea is one of the largest semi-enclosed seas and the second-largest biodiversity hotspots in the world. The sea basin encompasses diverse coastal and marine ecosystems that support biodiversity and provide numerous goods and services to the coastal communities living around its shores. However, the Mediterranean Sea is facing various threats, driven by natural forces and anthropogenic pressures related to an unprecedented "Blue Gold Rush" as defined by (Piante and Ody, 2015). This situation will drive key maritime sectors in the Mediterranean Sea to record positive growth in the coming decade, except for the professional fisheries. The combined positive growth of all sectors will create competition over the marine space, leading to conflict of uses and further deterioration of marine ecosystems. For this reason, the organisation and planning of maritime activities within the Mediterranean Sea are needed now more than ever, and marine spatial planning has shown to be a great tool to organise marine activities, reduce conflict of uses and also encourage economic development and investment by supporting predictability and transparency.

In this context, this study was carried out to support discussions and development of the preplanning phase of a regional transboundary marine spatial planning in the Western Mediterranean Sea basin. The analysis followed a transboundary, integrated approach, and assessed the current conditions and compatibilities of maritime uses and future scenarios for MSP and blue growth in the context of the Western Mediterranean Sea basin.

The results of the analysis show that in the upcoming decade, the development of maritime sectors in the Western Mediterranean will mirror their development in the Mediterranean Sea at large by recording positive growth. This expansion will lead to competition over the marine space and conflicts between uses and between uses and the environment. The main conflicts identified in the Western Mediterranean are expected to arise between maritime traffic and priority areas for the conservation of cetaceans, on the one hand, and between marine protected areas and the aquaculture and oil and gas sectors, on the other.

To analyse the future conditions and scenarios for marine spatial planning and blue growth opportunities in the Western Mediterranean, a second study -complementing the present one- developed three scenarios for the Western Mediterranean Sea basin for 2030. The analysis developed a conservationist first scenario, a second scenario projecting the development of the existing maritime activities in the future and a third scenario with minimised conflicts between maritime activities due to the application of the blue economy strategies.

While carrying this study, multiple challenges were faced. The main challenge pertained to the unavailability of data, especially from the southern Mediterranean countries. To complement the data found, requests were sent to the MSPglobal National Focal Points in each country when data proved to be unavailable. However, despite multiple requests, not all data was received or was received in a format difficult to work with. This situation presented limitations to the work, making the analysis not fully representative as data from both Mediterranean shores was not comparable due to the data gaps (Annexes). Data sharing is a cornerstone to the promotion of partnerships and cooperation between the Member States, it is therefore an area where collaboration can be greatly improved for sustainable blue development of the Western Mediterranean Sea basin.

Sustainable development in the Mediterranean is crucial to address the rising environmental, social and economic challenges in the region. Several multilateral agreements and governance structures have been consolidated at the regional level over the last four decades; however, these agreements are found to not be adapted to the economic realities of all Member States, especially southern ones, which undermines their application and creates a further gap between northern and southern states. Another challenge is related to the lack of technical capacities in the administration of some Member States, especially southern ones, to participate effectively in the development and implementation of such multilateral agreements. It is therefore crucial to improve mechanisms for cooperation between States advance technical assistance and promote capacity building.

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Annex 1. Data gaps

Summary of the data gaps.
Legend: **Red:** complete data gap, **yellow**: partial gap regarding quality or quantity, **green:** data available; **WMS**: Web Map Service.

Data		Countries							Comments
Theme	**Spatial representation**	**Morocco**	**Algeria**	**Tunisia**	**Malta**	**Italy**	**France**	**Spain**	
Fisheries	**Fishing effort**								Information requested to all countries
	Areas				Trawling areas and fisheries management zone (WMS)			Fishing grounds (WMS)	
	Catches data								At FAO division level
	Economic value by port	It was provided in a graphical representation without values							
Ocean research	**Cruise routes**								Requested to all countries
	Seabed samples								
Aquaculture	**Facilities**	Digitalised from a map							
Oil and gas exploration	**Offshore platforms**								Requested to North African countries
	Exploration and exploitation areas								
Renewable energy	**Offshore wind energy facilities**	Data provided confirmed that there were no facilities at sea							
Maritime transport	**Traffic flows**								
Military	**Training areas**								
	Dumped munitions								
Marine Protected Areas									It was not possible to check whether data from North African countries was accurate and updated, this information was requested but not received
Submarine cables									Part of the data was available only in WMS
Submarine pipelines							Part in WMS		
Tourism	**Nights per km²**				WMS				
Underwater Cultural Heritage									Requested to all countries

Annex 2. List of figures, tables and pictures

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Annex 3. List of acronyms

CAMP	Coastal Area Management Programme
CBD	Convention on Biological Diversity
CP	Contracting Parties
CS	Continental Shelf
CZ	Contiguous Zone
DG MARE	Directorate General for Maritime Affairs and Fisheries of the European Commission
EBSA	Ecologically or Biologically Significant Marine Areas
EEZ	Economic Exclusive Zone
EC	European Commission
EFPZ	Ecological and Fisheries Protection Zone
EPZ	Ecological Protection Zone
EU	European Union
FPZ	Fishery Protection Zone
GES	Good Environmental Status
GDP	Gross Domestic Product
GFCM	General Fisheries Commission for the Mediterranean
GVA	Gross Value Added
ICZM	Integrated Coastal Zone Management
IMO	International Maritime Organization
IMP	Integrated Maritime Policy
IOC	Intergovernmental Oceanographic Commission
ITA	International Tourist Arrivals
IUCN	International Union for Conservation of Nature
IW	Internal Waters
LME	Large Marine Ecosystem
MAP	Mediterranean Action Plan
MEPC	Marine Environment Protection Committee
MPA	Marine Protected Area
MSFD	Marine Strategy Framework Directive
MEPC	Marine Environment Protection Committee
MSP	Maritime/Marine Spatial Planning
MSSD	Mediterranean Strategy for Sustainable Development
OECM	Other effective area-based conservation measure
OWE	Offshore Wind Energy
OWF	Offshore Wind Farm
PAP/RAC	Priority Action Program Regional Activity Centre
PSSA	Particularly Sensitive Sea Area
SDG	Sustainable Development Goal

SIMWESTMED	Supporting Implementation of Maritime Spatial Planning in the Western Mediterranean region Project
SPA/RAC	Specially Protected Areas/Regional Activity Centre
SPA/BD	Specially Protected Areas and Biological Diversity Protocol in the Mediterranean
SPAMI	Specially Protected Areas of Mediterranean Importance
SSF	Small-Scale Fisheries
TEU	Twenty-foot Equivalent Units
TOE	Tonne of Oil Equivalent
TS	Territorial Sea
UfM	Union for the Mediterranean
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WestMED	Western Mediterranean Initiative

Conflicts between maritime traffic and priority areas for the conservation of cetaceans are expected to rise in the upcoming years in the Western Mediterranean Sea, as are conflicts between marine protected areas and the aquaculture and oil and gas sectors. Maintaining the status quo will only exacerbate competition between maritime activities in the region.

The successful implementation of ecosystem-based Marine Spatial Planning in the Western Mediterranean Sea is needed now more than ever to prevent future conflicts, build synergies and achieve a sustainable blue development of the sea basin.

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