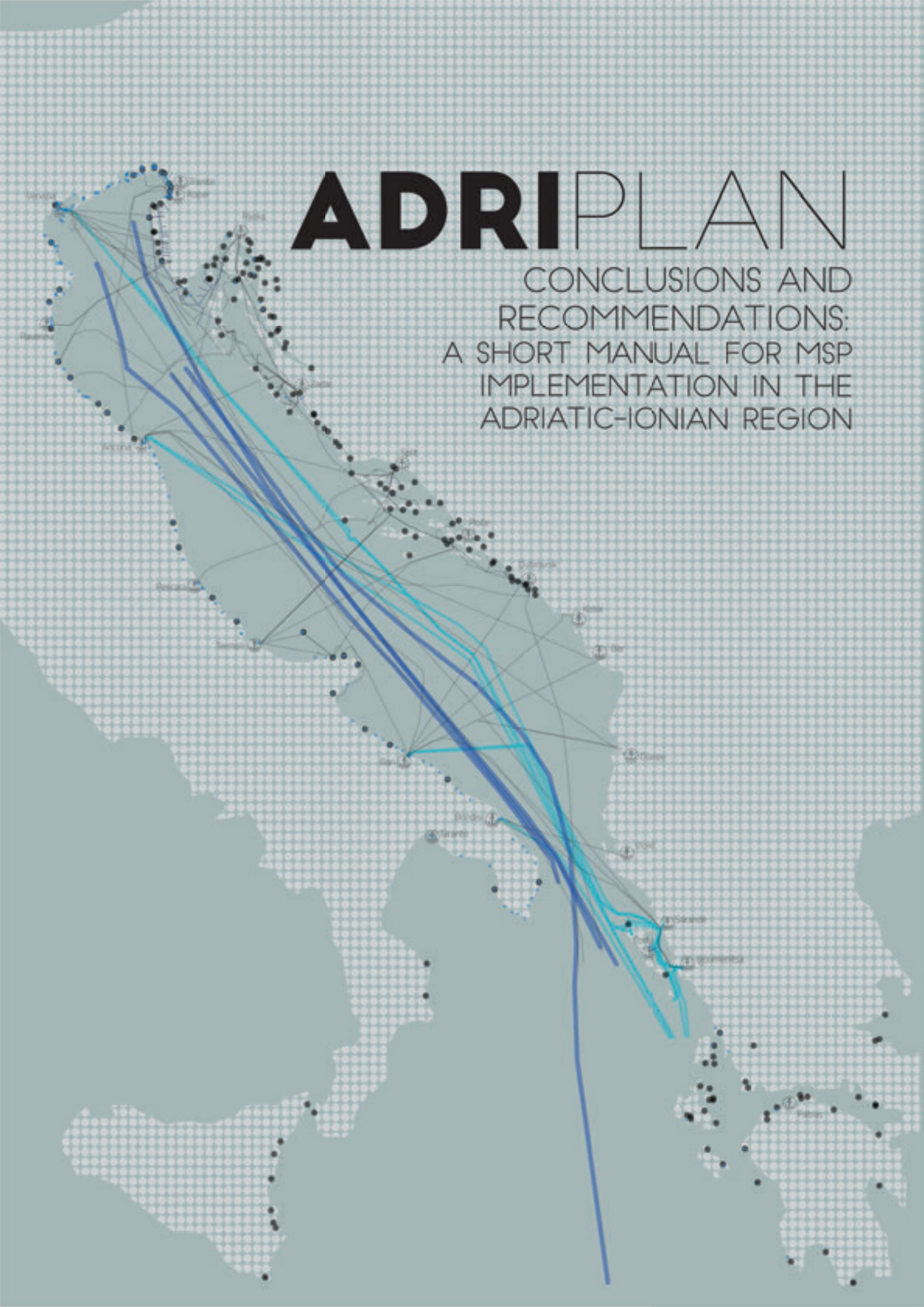


ADRIPLAN

CONCLUSIONS AND
RECOMMENDATIONS:
A SHORT MANUAL FOR MSP
IMPLEMENTATION IN THE
ADRIATIC-IONIAN REGION



ADRIPLAN Conclusions
and Recommendations:
A short manual for MSP
implementation in the
Adriatic-Ionian Region

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Stakeholders

A large number of other Public Administrations, Civil Society Organizations, private enterprises, representatives of EU projects and single professionals participated to the ADRIPLAN stakeholder workshops and to the related activities. They all deserve sincere thanks from the Project team for their valuable and free contribution, which was essential to the project results.

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Special thanks to the students of the Erasmus Mundus Master Course on Maritime Spatial Planning (EMMCMSP) 2013/2015

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All illustrations and maps have been produced by ADRIPLAN Project and are available in the ADRIPLAN Data portal. Data have been collected by Partners using also the results of other projects. While it is not possible to mention all the many information sources, ADRIPLAN built in particular on the European Marine Observation and Data Network (EMODnet) and on the results of the following projects: SHAPE (IPA Adriatic Cross-Border Cooperation Programme), COEXIST (FP7 project), COCONET (FP7 Project).

In the maps included in this book, where state borders are represented, please consider that the boundary between the Republic of Slovenia and the Republic of Croatia has not been determined and is subject to the pending arbitration.

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ISBN 978-88-941335-3-0

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Co-funded by the



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Suggested citation

Barbanti A., Campostrini P., Musco F., Sarretta A., Gissi E. (eds.) (2015). ADRIPLAN Conclusions and Recommendations: A short manual for MSP implementation in the Adriatic-Ionian Region. CNR-ISMAR, Venice, IT.

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Prof. Arronau: You like the sea, Captain?" Nemo: "Yes; I love it! The sea is everything. It covers seven-tenths of the terrestrial globe. Its breath is pure and healthy. It is an immense desert, where man is never lonely, for he feels life stirring on all sides. The sea is only the embodiment of a supernatural and wonderful existence. It is nothing but love and emotion; it is the 'Living Infinite,' as one of your poets has said. In fact, Professor, Nature manifests herself in it by her three kingdoms -- mineral, vegetable, and animal.

Jules Verne (1828-1905) – Twenty thousand leagues under the sea

The reason for the difference between the sea on one hand and land and rivers on the other, is that in the case of the sea the same primitive right of nations regarding fishing and navigation which existed in the earliest times, still today exists undiminished and always will, and because that right was never separated from the community right of all mankind, and attached to any person or group of persons.

Hugo Grotius (1583 – 1645) - Mare liberum

The sea unites the countries that it has separated.

Alexander Pope (1643-1733)

Foreword

The Mediterranean Sea is complex in its physiography (the average depth is 1,500 m, the deepest point is 5,267 m, with large shallow areas, like in the North Adriatic), in its ecology and in its social dimensions, in terms of interconnections between human activities and environmental characteristics. Surrounded by 22 countries, the coasts of the Mediterranean Sea house more than 150 million inhabitants together with a unique natural and cultural heritage, with over 400 UNESCO sites and several Marine Protected Areas. Today it is felt that the peculiarities of the Mediterranean offer major local opportunities for Blue Growth, from fisheries and tourism to energy and maritime transport. All traditional as well as emerging maritime economic sectors currently operating in the Mediterranean are expected to grow and expand over the next years with a consequent need to better consider the environmental impacts.

The need for protecting the vulnerable ecosystem has been recognised since the adoption in 1976 of the Convention for Protection of the Mediterranean Sea against Pollution (Barcelona Convention) by all countries with a Mediterranean shoreline as well as the European Union.

The situation is more complicated from the point of view of the use of resources. Most Mediterranean States have established a 12-mile territorial sea, reduced to 6 mile in some cases, but few started the process for establishing Exclusive Economic Zone (EEZ), as defined and regulated by the United Nations Convention on the Law of the Sea (UNCLOS). Therefore, the existence of a large area of high seas in the Mediterranean requires a high level of cooperation between coastal states to ensure the sustainable utilisation of resources (e.g. for fisheries).

In this context, the challenge for a properly assessed allocation of marine space to the concurrent activities taking place on (and in) the sea is higher, but probably also more necessary than elsewhere. The ADRIPLAN pilot project, focused in a quite complicated part of Mediterranean, the Adriatic Ionian Region (AIR), is aimed to demonstrate that the MSP challenge in the Mediterranean is NOT a “mission impossible”.

In ADRIPLAN we ran an experiment, almost free from the complicated alignment of different national political decisions, but involving the local government institutions closer to the needs of stakeholders and citizens, i.e. the Regions. All the main economic sectors were taken into consideration and most of them participated actively to this experiment. The result is represented in this book. It is not a “real” Plan, as it is not binding for anyone, and does not involve or imply any endorsement of the Public Authorities (at any level) in the AIR.

Nevertheless, ADRIPLAN is a “realistic” experiment, where the actual needs, desires and perspectives coming from the territories with a coast to the

Adriatic and Ionian seas were taken into consideration.

It represents a good step in the macroregional EUSAIR strategy, towards the adoption before the 2021, as required by the EU directive on MSP 2014/89/EU, of effective maritime plans in the area, providing guidelines and suggesting good practices valid for the entire Mediterranean Sea. The proper spatial allocation of the activities is necessary also for reaching the goal of Good Environmental Status, as stated in the Marine Strategy Framework Directive (2008/56/EC).

Finally, It is worth to mention the renewed attention to the Mediterranean Sea paid in these last years by EU institutions. It has been a pleasure, for a “Mediterranean EU citizen” like me, to run this pilot project in parallel with the development of the BLUEMED initiative, a Strategic Marine and Maritime Research and Innovation Agenda for Blue Growth in The Mediterranean Sea, that is going to be launched when ADRIPLAN is ending. Supported by a coordinated R&I effort, the sustainable use of the Mediterranean’s richness, will help to place once again this Marine Region at the centre and not at the periphery of Europe.

The future Mediterranean shall be more peaceful, respectful of human rights and justice, lower in poverty and in social disparity than the present.

Pierpaolo Campostrini

ADRIPLAN project coordinator

Member of IT delegation in JPI Ocean and in Horizon 2020 Program Committee on the Societal Challenge “Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bioeconomy”,

Associated researcher of ISMAR-CNR and director of CORILA

Why this Booklet

Maritime Spatial Planning (MSP) is a practical way to create and establish a more rational organisation of the use of marine space and the interactions between its uses, to balance demands for development with the need to protect marine ecosystems, and to achieve social and economic objectives in an open and planned way (Ehler and Douvère, 2009).

The so-called “Blue Economy” in the Adriatic and Ionian Region (AIR) generates an annual turnover that exceeds €21 billion, with an increasing growth trend. An effective spatial planning is an essential condition in order to guarantee a long-lasting development ensuring a sustainable use of marine resources for future generations.

This is particularly true in areas such as the Adriatic-Ionian Region, where several uses are competing for the same space and the same resources and where the transboundary dimension needs to be taken into account for the best regulation of those uses.

MSP is also an opportunity to connect the marine and the maritime world, essential components of Blue Growth.

While an extended presentation of ADRIPLAN results is contained in the ADRIPLAN Final Report “Developing a Maritime Spatial Plan for the Adriatic Ionian Region”, this booklet intends to summarise key findings of ADRIPLAN (chapters 3 and 4) and to be a short manual, or at least a vademecum (actually a commented checklist – chapter 5), for those who, at different levels and with different responsibilities, are or will be involved in the elaboration and implementation of spatial plans in the AIR.

It is meant to be applied in general to the process of developing MSP plans and to single projects dealing with specific aspects of the MSP process.

This Report takes direct inspiration from the TPEA Report “TPEA Good Practice Guide” (Jay and Gee, 2014), for which we thank the Editors and all the Authors.

ADRIPLAN is the first Pilot Project co-financed by EC DG Mare (MARE/2012/25) aimed at promoting MSP implementation in the Mediterranean Sea.

ADRIPLAN has the overall objective to analyse and promote transboundary Maritime Spatial Planning in the Adriatic–Ionian Region, a Mediterranean area bordered by many states and crowded by multiple uses of the sea and valuable ecosystems to protect. Other studies and projects have already showed the great potential for MSP in the area (e.g. COASTPLAN; SHAPE; Policy Research Corporation, 2011).

The ADRIPLAN project develops proposals and recommendations for an operational cross-border MSP process which:

- allows the development of different maritime activities, preventing conflicts for space allocation, while ensuring a good status of the marine ecosystems and supports the provisioning of Ecosystem Services (ES);
- provides greater confidence for investment in infrastructures and in other economic activities, responding to the peculiarities of each area;
- fully involves relevant regional and governmental bodies and other relevant stakeholders, also promoting an effective cross-border cooperation;
- enhances coherence between terrestrial and Maritime Spatial Planning, also in relation with good Integrated Coastal Management (ICM) practices.

ADRIPLAN considers the whole AIR as its study area, with a specific attention to its transnational dimension, but mostly concentrates its analyses and proposals on two Focus Areas (Figure 1), whose boundaries have been defined through a combination of criteria (objectives of the project and the MSP effort; legal jurisdictions on maritime waters and seafloors and governance; issues related to trans-boundary and cross-border aspects; maritime uses and their economic domains; key environmental components and dynamics).

ADRIPLAN is based on the best available knowledge, is developed through a transboundary partnership, with the support of Institutional Partners and Observers and the involvement of relevant stakeholders, and is promoting the harmonised implementation under an ecosystem based approach of the EU legislative framework on marine and maritime issues.

ADRIPLAN, as Pilot Study promoted and co-financed by DG Mare, is part of a Strategy being deployed under the coordination of DG Mare (EC-DG Mare, 2015), to support through a number of specific objectives and actions the implementation of Directive 2014/89/EU, establishing a framework for maritime spatial planning aimed at promoting the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources.

According to the new Directive, Member States are required to develop national maritime spatial plans by 2021 and review them at least every ten years, in order to better coordinate the various activities that take place at sea, ensuring they are as efficient and sustainable as possible.

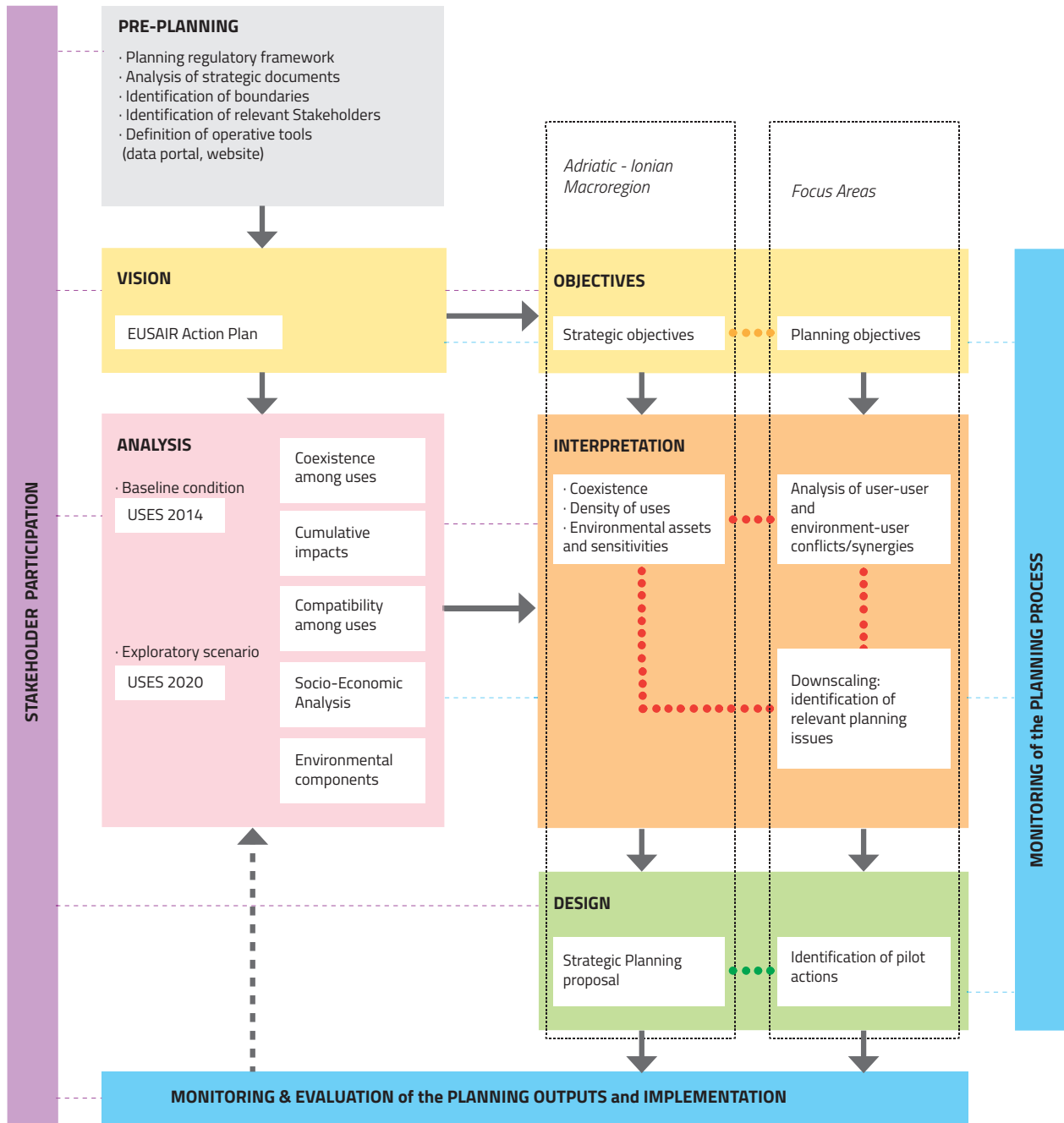
The Directive is part of a wider strategic view on European Seas expressed, among others and specifically for the Mediterranean, by:

- the EU Cohesion and Neighbourhood Policy (ENP);
- Regional Strategies, established and under discussion, in the Mediterranean;



1. ADRIPLAN study area (AIR, Focus Area 1, Focus Area 2)

ADRIPLAN METHODOLOGY



2. Flowchart of the activities developed under ADRIPLAN methodology.

ADRIPLAN Methodology

Aim of the ADRIPLAN methodology is to adopt an Ecosystem Based Approach to the management of maritime activities, considering the characterisation of maritime activities interrelations, as a theoretical and operational link between human activities in coastal and marine space and ecological and environmental components.

The main goal of the planning process is to address a sustainable development of the AIR, in line with the European Blue Growth strategy (economic development), the Marine Strategy Framework Directive (2008/56/EC) (environmental protection) and to strengthen the relationships and cooperative activities between Member States.

The methodology is detailed in an operative framework for the construction of a MSP process, which operationalises an EBA, focusing on the integration of human uses, environmental dynamics and place-based supplied services. The methodology (for more details see Gissi and Musco, 2015) is divided in several phases, organised in a flowchart (Figure 2). In cases, phases are carried out first at the AIR scale, using a more strategic approach, and then at a Focus Area scale, downscaling the approach and defining more precisely a number of pilot actions.

Cross-cutting issues take place in different steps along with the implementation of the planning process, as for the activities related to stakeholders' participation, as well as to monitoring the planning process. Such methodology is proposed as a reference step-by-step methodology to be applied in the AIR.

- Regional Seas Conventions (the Barcelona Convention in the Mediterranean);
- the Integrated Maritime Policy;
- the Blue Growth Initiative;
- the Marine Strategy Framework Directive and other relevant Directives on environmental and biodiversity protection.

The process towards the establishment of a European Union Strategy for the Adriatic and Ionian Region (AIR) (Figure 3), promoted and coordinated by the EC with a strong and direct involvement of Member and non-Member States of the Region, brought to the recent delivery of the Action Plan of EUSAIR (Communication (COM(2014) 357 final), EC, 2014a; EC, 2014b), which has been finally adopted in October 2014 by the Council.

The Communication sets out the needs and potential for smart, sustainable and inclusive growth in the Adriatic and Ionian Region.

It provides a framework for a coherent macro-regional strategy and an Action Plan, to address those challenges and opportunities, through cooperation between the participating countries.

The Action Plan is also the result of an intense consultation, involving public and private stakeholders, and was supported by studies on the potential of Blue Growth in the area (Eunetmar, 2014).

The Plan is structured in four pillars, ten topics (Figure 4), a number of indicative actions and projects. Marine and maritime aspects are predominant in the Plan and MSP/ICZM are explicitly cited as cross-cutting tools to implement the Plan, both at national and cross-border level, on the basis of the ecosystem approach and making the best use of results of key EU research project.



Pillars	Topics
Blue Growth	Blue technologies Fisheries and aquaculture Maritime and marine governance and services
Connecting the region	Maritime transport Intermodal connections to the interland Energy networks
Environmental quality	The marine environment Transnational terrestrial habitats and biodiversity
Sustainable tourism	Diversified tourism offer Sustainable and responsible tourism management

3. The Adriatic-Ionian Region (AIR)-
Source: EUSAIR (COM(2014)357 final

4. General structure of the EUSAIR
Action Plan.

1. Environmental status related to the pool of existing pressures

In order to achieve the goal of a long-term sustainable development in the Adriatic–Ionian Region, MSP should guarantee that Good Environmental Status (GES), as defined in the Marine Strategy Framework Directive (MSFD), is maintained and that pressures and impacts of human activities on key environmental components of the marine ecosystem are correctly evaluated and managed.

In the framework of MSP, in order to correctly assess the pressures and impacts of the different planning options on the environmental status, specific information at adequate spatial and temporal resolution must be collected and used, in accordance with the spatial and temporal extension of the maritime space involved in the activity (e.g. from local mussel farming to large scale maritime transport).

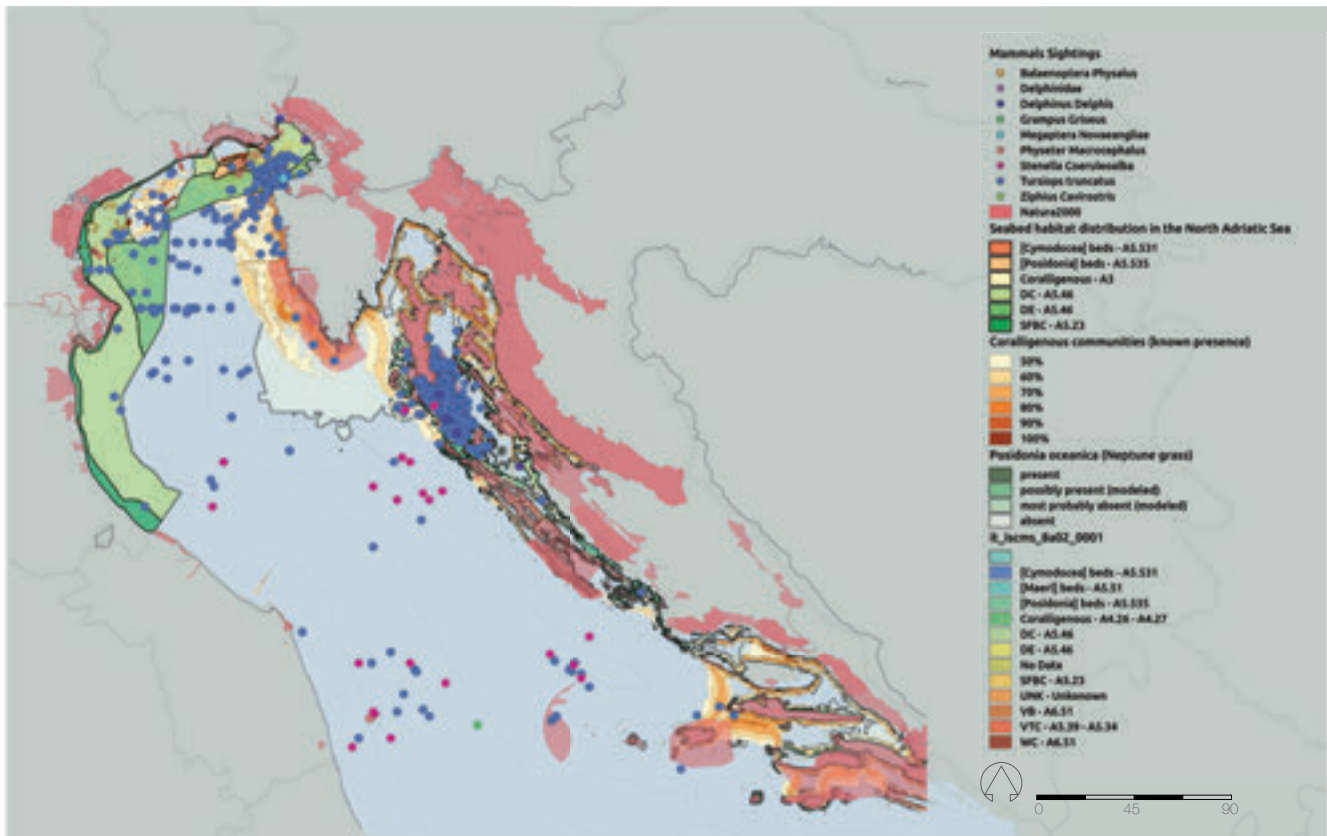
The intensity of pressures and impacts of maritime activities on the environment is tightly related to the specific environmental features involved, therefore, the specific physiographic, bathymetric, oceanographic and biological features of the basin are key elements to be considered in order to properly design and evaluate planning options.

The informative framework collected in the ADRIPLAN Initial Assessment (Mosetti and Lipizer, 2014) indicates that the Adriatic–Ionian Region presents a wide range of relevant environmental features. The Region is characterised by:

- High biodiversity and presence of many species and habitats requiring special conservation and management measures (eg. *Posidonia oceanica* meadows, coralligenous habitats, nesting sites of marine reptiles, habitats of several endangered marine mammals,...);
- High risk of introduction of non-indigenous species (NIS);
- Presence of nursery and spawning areas of fish of high socio-economic and environmental relevance;
- Over-exploitation of several commercially relevant fish stocks;
- High vulnerability of food web integrity;
- The sea floor hosts several habitats of high ecological and economical relevance (rocky coralligenous habitats, biogenic hard substrates);
- Hot spots of contamination from hazardous substances (several Sites of National Concern – SIN (Siti di Interesse Nazionale), along the Italian coast), together with high risk of contamination caused by ship accidents due to high traffic intensity;
- Increasing trend in marine litter;
- Probable high level of underwater noise;
- High vulnerability to sea level rise and global climate change;
- Seismic hazard.

Considering in particular the **Focus Area 1**, the main environmental issues concern:

- Hot spot of biodiversity and of endemism, especially of fish species;
- Presence of sensitive benthic habitats crucial for biodiversity conservation along the Veneto and Friuli Venezia Giulia, of lagoons and critical environments that are classified of primary importance

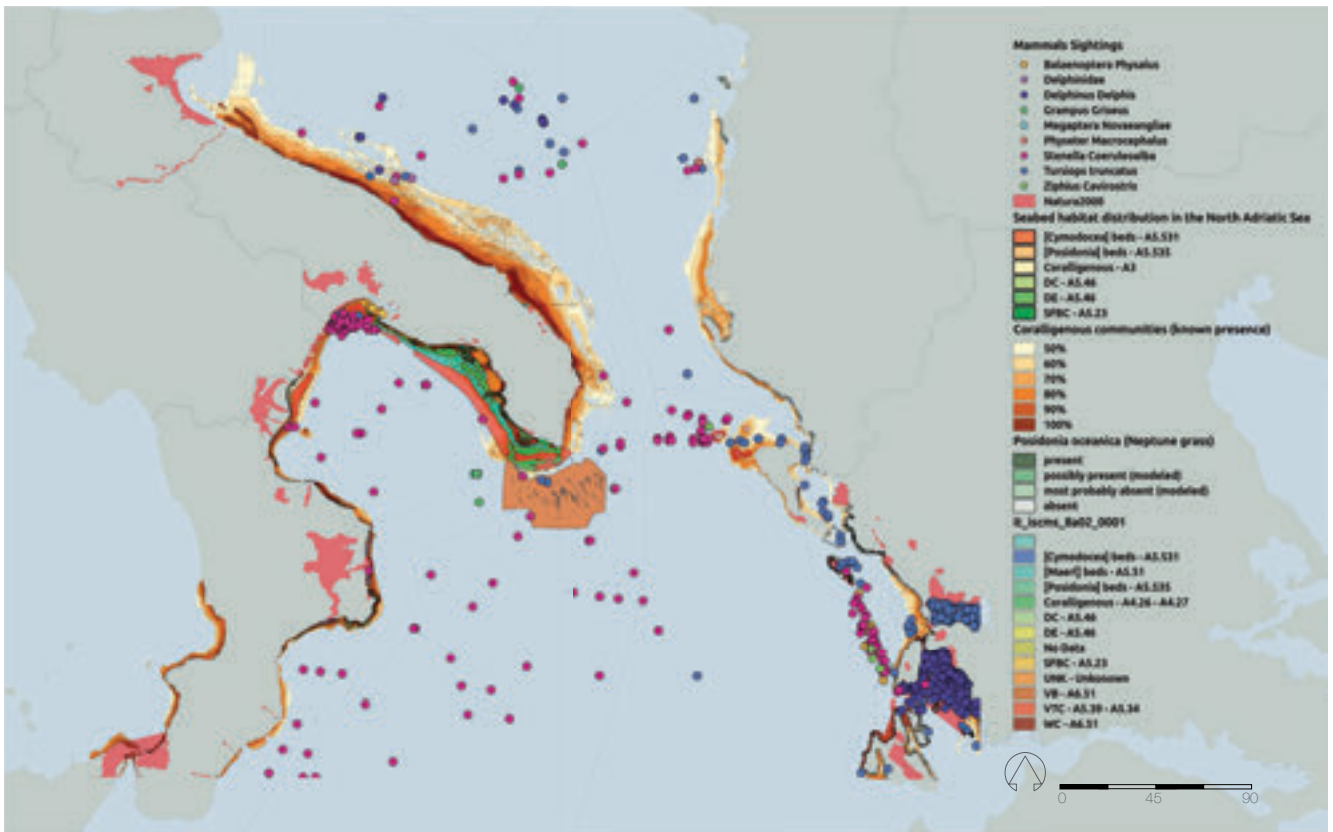


5. Distribution of species and habitats requiring special conservation and management measures in FA1.

- according to the Habitats Directive (92/43/EEC) and that provide valuable ecosystem services (Figure 5);
- Several peculiar submarine rock outcrops located in patchy features in all the northern shallow Adriatic sea hosting hotspots of biodiversity;
 - Particularly high risk of introduction of non-indigenous species due to the intense activities in the North Adriatic ports;
 - High exploitation of fish and shellfish stocks;
 - Particularly high vulnerability of food web integrity due to cumulative impacts of several concentrated pressures (wide range of trophic conditions, hypoxia risk, overfishing, jellyfish increase, physical loss and damage);
 - Several localised areas at risk of eutrophication (Po River input and coastal lagoons);
 - Sea floor integrity threatened by several conflicting activities such as construction and maintenance of ports and other coastal developments, land claim, tourism, beach nourishment, oil and gas installations, cables and pipelines, aquaculture and artificial reefs; fish trawling;
 - Large degree of coastline artificialisation and high vulnerability to erosion and subsidence;
 - Confined areas at risk of contamination from hazardous substances.

The distinctive features of **Focus Area 2** include:

- Vital area for biodiversity, hosts critically endangered species and key populations of globally threatened species of marine mammals and reptiles, presence of some key priority habitats (Figure 6);



- Important migrating corridor for cetaceans, marine turtles and monk seals to and from the Adriatic Sea;
- Risk of introduction of non-indigenous species close to the main ports;
- Presence of anchovy nursery habitats;
- Confined areas at risk of eutrophication;
- Confined areas at risk of contamination from hazardous substances;
- Increase in marine litter and presence of military dumping areas;
- Presence of several Natura2000 sites and areas of special conservation.

6. Distribution of species and habitats requiring special conservation and management measures in FA2

2. Key uses, conflicts and potential synergies

The AIR is crowded by uses, with all typical marine and maritime uses concentrated in a relatively small area: transport of goods and passengers, fisheries, aquaculture, oil & gas, energy and communication cables, coastal tourism, military uses, sand extraction, cultural heritage, protected areas. The scenario at 2020 adds potentially new uses and/or shows the increase of present uses (e.g. wind farming, aquaculture, coastal and maritime tourism, maritime transport, oil & gas, etc.).

Most data related to those uses and their spatial distribution have been collected from different sources and are now available through the ADRIPLAN Data Portal.

A detailed analysis of their interaction in space has been carried out using and adapting the methodology developed by the FP7 project "COEXIST"

(Schultz et al., 2010), and particularly the spatially explicit version of the method (GRID – Gramolini et al., 2013).

15 different uses have been considered and their conflicts and synergies have been analysed based on 4 different criteria: position on water column (surface, water column, seafloor); activity domain (small, medium, large); activity temporal domain (short, medium, long/permanent); mobility (fixed or mobile). Conflict scores at 1 km² resolution have been calculated, together with associated statistics (for more details see Barbanti et al., 2015).

The map in Figure 7 shows the “number of overlapping uses” per each cell of analysis, as the sum of the scores of “coexistence score” of each pairs of maritime uses insisting on the same cell of analysis.

Coastal & Maritime Tourism vs Trawling and Trawling vs Small Scale Fishery are the combination of uses which occupy the greater number of cells, while Trawling is the use that in percentage contributes more to the final score (26%).

Synergies and conflicts between uses, as emerging from the analysis of coexistence and from the stakeholders participation process, together with their potential impacts on the ecosystems (e.g. specific evaluations and cumulative impacts analysis), are collected and analysed at once, to put in evidence emerging issues and demands for planning. Regarding interactions among existing and future maritime uses, these were identified on the base of indications provided within the planning process by technical and institutional partners, as well as by stakeholders.

Synthesis maps with spatial identification of main conflicts/synergies emerging through the previously performed analysis are elaborated. In the maps the following issues are reported and, if possible, spatially localised:

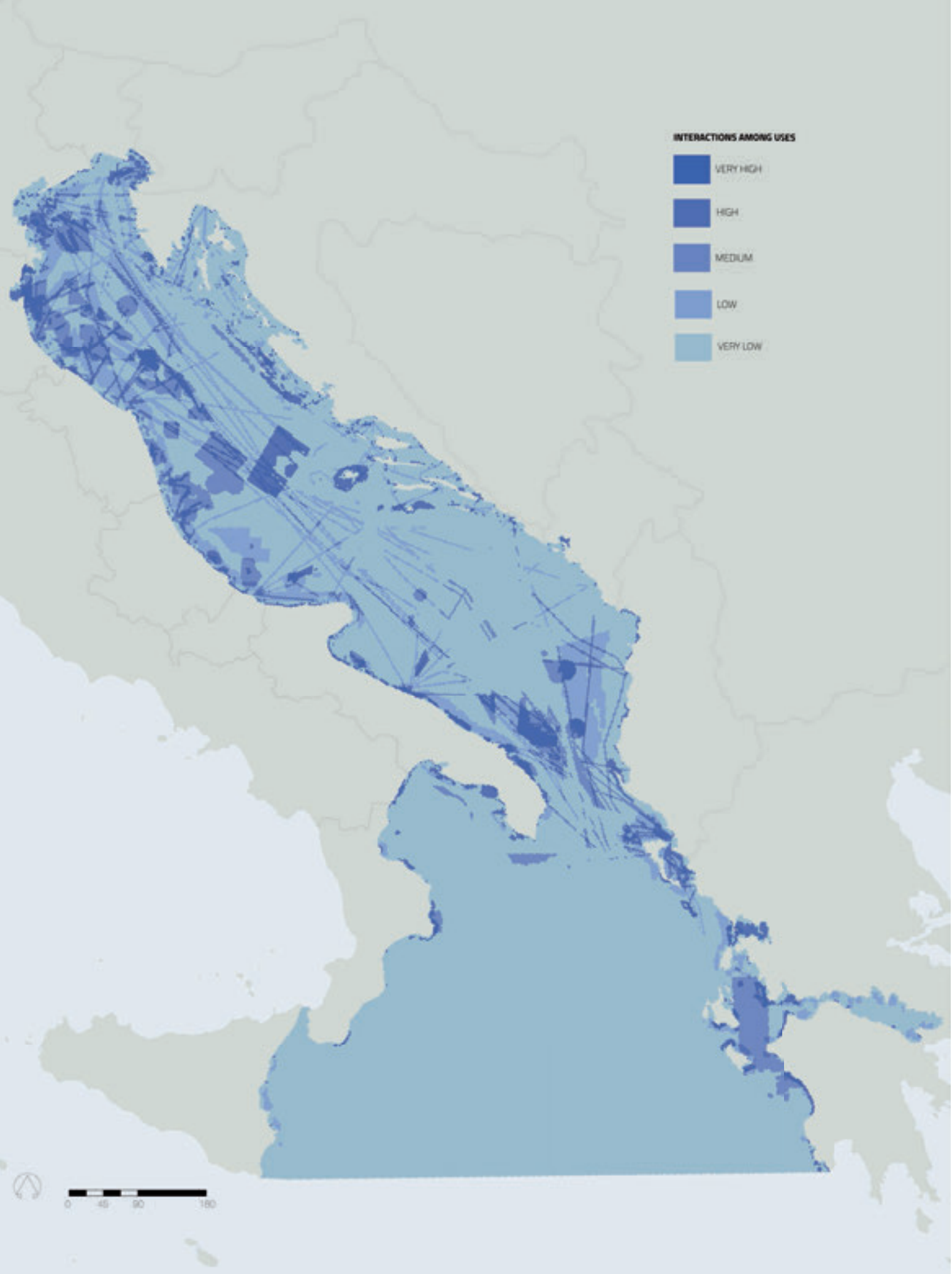
- (i) use-use conflicts/synergies;
- (ii) environment-use conflicts/synergies;
- (iii) regulatory/management/ planning conflicts;
- (iv) main planning needs and priorities (from the results of the stakeholder involvement process, main issues emerged by dialogue with institutions and analysis of uses at 2020).

As an example, the synthesis maps for “Maritime transport and tourism” and “Environmental protection” are presented below (Figure 8 and 9).

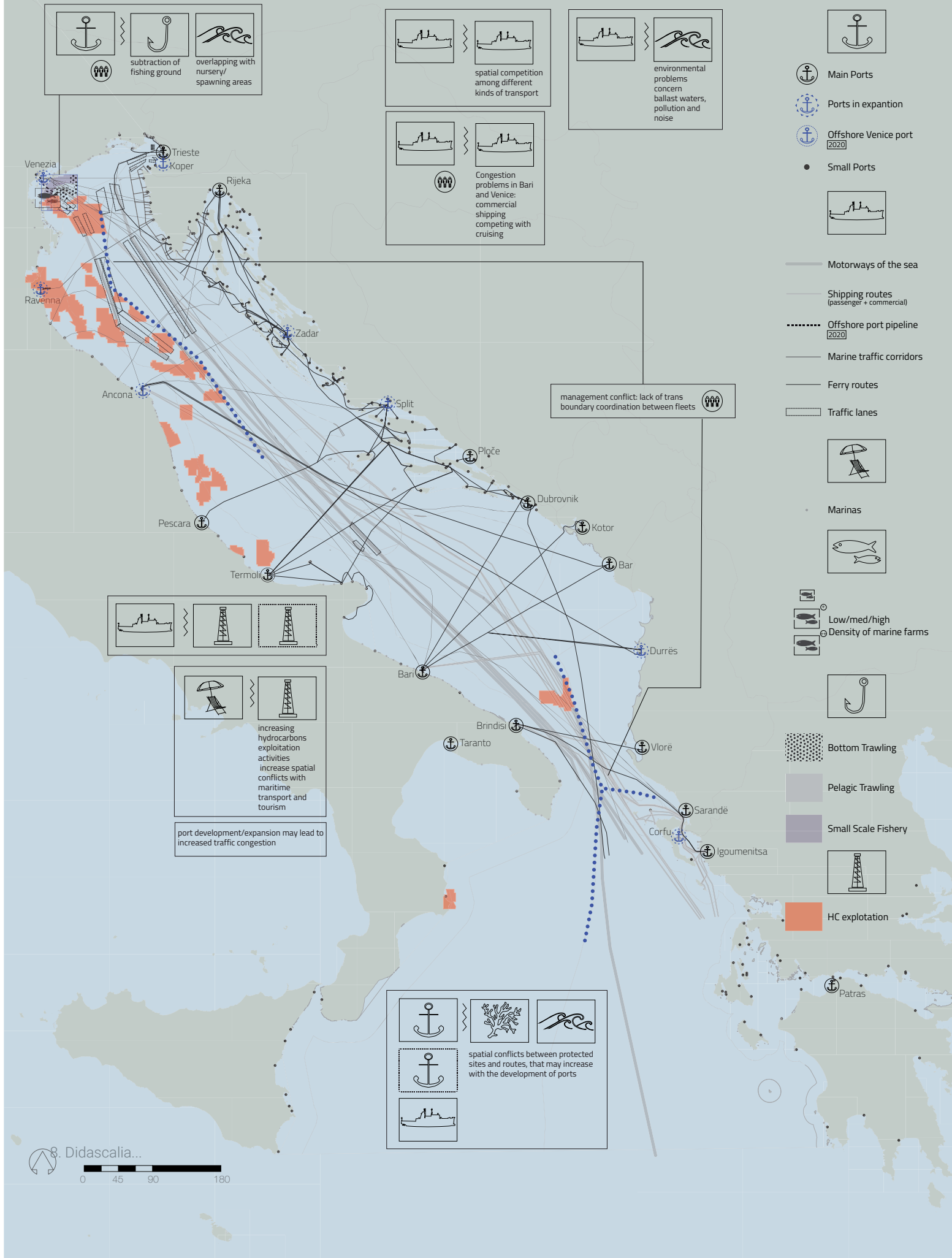
3. Vision, management objectives and potential added value of MSP

The spatial explicit analysis depicts macro-conflicts/synergies, to be potentially addressed by the strategic plan, as well as meso- and micro-scale issues to be potentially addressed by specific planning measures in the two Focus Areas. In other words, this activity allowed the identification of relevant planning issues to be potentially addressed by planning strategies and measures.

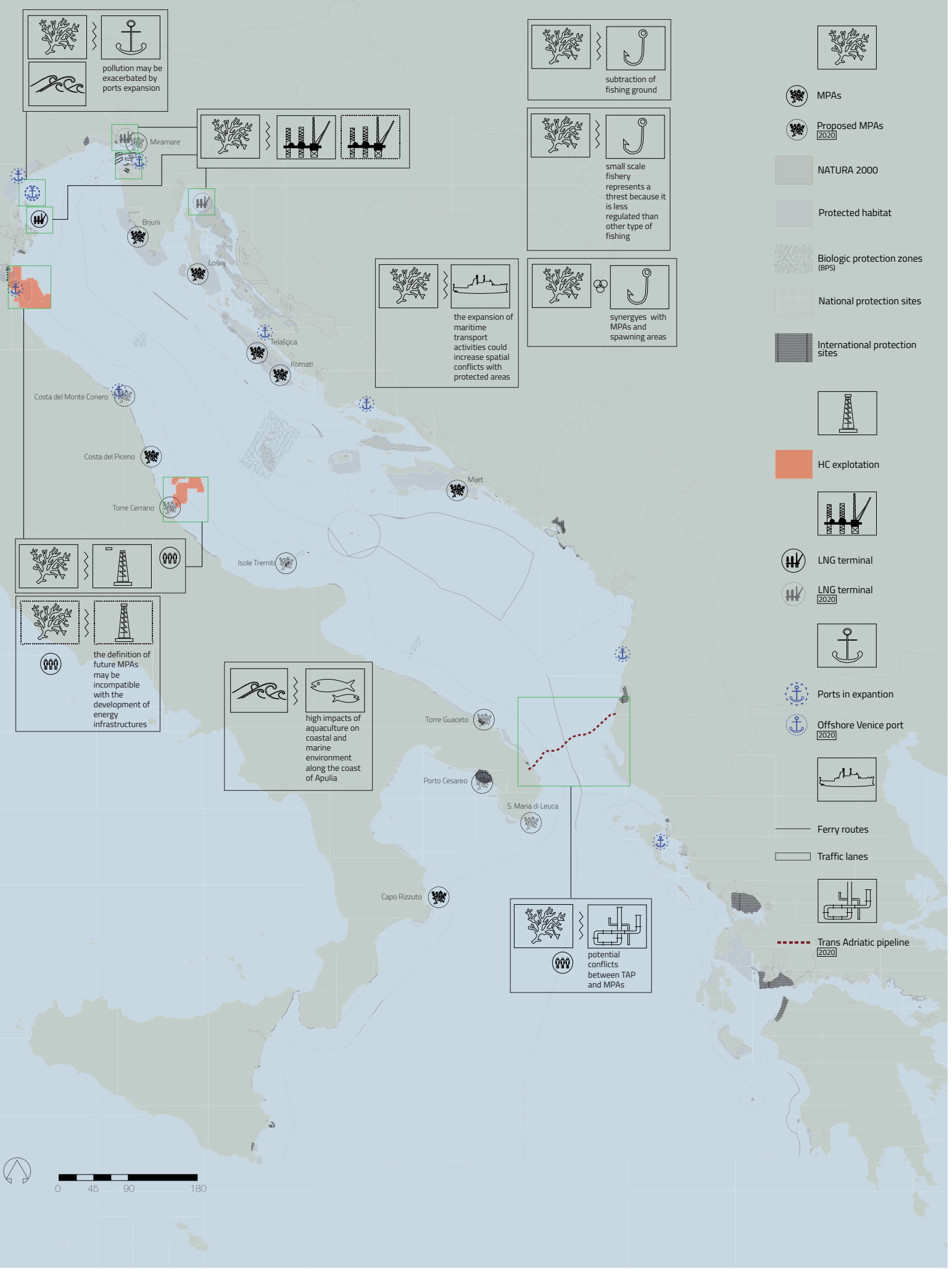
Such planning issues are integrated within the vision for the AIR expressed by the EUSAIR Action Plan and are consequently becoming a complete framework of high-level goals and management objectives for MSP in the AIR. As such, they are presented in the following, for each sector/cross-cutting issue considered.



7. Analysis on coexistence between uses, as "number of overlapping uses".



8. Synthesis map for the pivotal use "Maritime transport and tourism".



9. Synthesis map for the pivotal use "Environmental protection".

Coastal and Maritime Tourism	
High level goal	Sustainable maritime tourism
Management Objectives	Enhance the attractiveness of tourism in the region to international tourists and reduce seasonality
	Improvement of port infrastructure (cruise and tourist ports) and interchange hubs for intermodal transport (road and railway transport system) to coastal tourism
	Promote cruise tourism
	Cluster maritime tourism destinations thematically (e.g. with cultural heritage sites)
	Develop and promote an integrated tourism product involving a network of ports and a network of marinas
	Develop tourism development indicators
	Promote sustainable tourism activities and routes, building a common brand for the region, diversifying the cruise and nautical sectors and enhancing the value and appreciation of natural and cultural heritage
	Reduce the impact of tourism related structures on the environment
	Improve quality and diversification of the tourism product offered
	Promote temporary and removable structures for touristic purposes in beaches and coastal zones
	Introduce more intensive cooperation in the region among public and private stakeholders
	Improve coordinated governance in the tourism sector
	Strengthen UNESCO sites
	Reduce coastal and maritime tourism environmental impact
	Establishing proper monitoring mechanism
Maritime Transport	
High level goal	Sustainable maritime transport
	Spatial integration
	Market internationalisation
Management Objectives	Reduce present and future maritime traffic congestion, allowing the expansion of cargo and passenger traffic, while limiting environmental impacts and conflicts with other uses
	Reduce pollution from ship traffic
	Develop a Vessel Traffic Monitoring System
	Improve Efficiency and Security of Ports (Improve Management, Develop Infrastructure, Implement ISPS Code)
	Promote short-sea shipping
	Promote measures to facilitate better connection of islands to the mainland and long distance intra AIR ferry passenger transport
	Enhance and develop intermodal transport
	Identify and work on new trading routes
	Improve connections on North-South and East-West axes and in connection to TEN-Ts Motorways of the Sea
	Smart Integration in the global Supply chain through shipping
Optimisation of interfaces, procedures and infrastructures to facilitate trade	
Energy	
High level goal	Safe and sustainable hydrocarbon search and exploitation
	Interconnection of electricity grids and promotion of the development of integrated energy market, also from renewable energies
	Gas networks for diversified and efficient supply
Management Objectives	Support sustainable development of search and exploitation activities, reducing conflicts with other uses and facilitating a thorough environmental permitting at the right spatial scale
	Ensure safety and security of search and exploitation activities
	Improving cross-border electricity interconnections, minimising conflicts with other uses in the area
	Locate offshore wind farms
	Enhance the transportation of natural gas from Eastern Europe
	Support the location of new LNG terminals and the best use of the areas surrounding the existing LNGs and realising main pipelines, minimising conflicts with other uses in the area
Fishery and Aquaculture	
High level goal	Sustainable development of fishery
	Sustainable development of aquaculture
Management Objectives for Fishery	Zoning of fisheries to reduce overfishing of pelagic and demersal species, with particular attention to fishery in nursery areas and coordinated management of stocks
	Promote the role of small scale fisheries in the area, considering its important and peculiar socio-economic value for coastal communities
	Assisting the adaptation of fishery methods and gears to the new obligations deriving from the Common Fishery Policy Reform
	Creation of a control system of fishing effort (to tailor the EU fishery policy on regional specificities, filling the existent gaps in the southern Mediterranean areas)
Management Objectives for Aquaculture	Improve sustainable aquaculture (including offshore aquaculture), through proper space planning for the development of new sites, co-location with other activities and facilitation of permitting procedures
	Improve productivity, quality and environmental sustainability of aquaculture (including offshore aquaculture) through proper space planning for the development of new sites co-location with other activities and facilitation of permitting procedures
	Explore and improve possibilities for cross-border collaborations according to which specific objectives should be selected (particularly identify collaboration between Italy and Greece on the development of different life stages of particular species considering the introduction of policy arrangements)
	Introduction of new species with high commercial value

10. High-level goals and management objectives for MSP in the AIR.

Climate change (cross-cutting issue)	
High level goal	Risk management and Climate change adaptation in coastal areas
Management Objectives	Coastal defence against erosion and flooding, developing a strategic approach (proper spatial scale; priorities; intervention and constant maintenance) and using marine sands (relict and of new deposition) as a strategic resource for beach nourishment and protection
	Promote the establishment of the setback zone (as defined in the ICZM Protocol, Art.8)
	Enhance the retreat of urban structures and facilitate the rebuilding of natural defence morphologies (sand dunes, beach vegetation, etc)
Environmental and Conservation Protection (cross-cutting issue)	
High level goal	Achieve Good Environmental Status (GES)
Management Objectives	Enhance the network of Marine Protected Areas. Move towards 10% surface coverage by 2020 of the Adriatic and Ionian Seas by Marine Protected areas, in line with international commitments
	Implement the obligations of the WFD, MSFD, H&B Directives (GES, FCS and Targets) and other national relevant environment protection obligations, using the Ecosystem-Based Management approach, to reduce impacts and pressures on species, habitats and ecosystems
	Reduce information gaps about the impact of the protection regulation on adjacent marine habitats/species
	Establish common assessment methodologies and monitoring plans throughout the Adriatic and Ionian states
	Reduce/eliminate the most destructive fishing practices
	Harmonise MPAs management
	Enhance management skills and communication strategies
	Address eutrophication by transnational coordinated actions
	Reduce Marine Litter
	Integrate climate change into MPAs monitoring
	Establish network on information on Non-indigenous species
	Preserve sea-floor integrity
	Preserve food-web integrity
	Limit risk of Non Indigenous Species introduction
	Support the production of management plans for SCIs
	Define shared Management Plans
	Underwater cultural heritage
High level goal	Preservation and sustainable use of underwater cultural resources
Management Objectives	Support the identification, documentation and research of cultural heritage on the seabed and coastal areas, facilitating the adoption of the long-term strategy for management and preservation of underwater sites of cultural importance
	Strengthen co-operation and sharing information across the region
	Achieve high standards in preventing and reducing threatening impacts and interventions
	Adopt the measures and solutions for the preservation of archaeological sites and historical wrecks
	Promote the presentation of underwater cultural heritage in situ
	Adopt the measures and solutions for sustainable touristic use of the cultural resources and its development; (vii) establishment and management of parks and protected areas in internal and territorial waters
	Exchange experience and share best practices for preservation and presentation for underwater cultural heritage through joint research projects and education programmes
	Examine the options for the establishment of a joint technological platform for the research of underwater cultural resources

10. High-level goals and management objectives for MSP in the AIR.

What we propose

1. Adriatic Ionian Region: a preliminary regional strategy

The elaboration of a strategy for the AIR has considered primarily transboundary issues, which require the setting of a transboundary governance framework. The aim is to reflect on effective governance structures to be able to tackle intensively used marine areas beyond national jurisdiction, in high seas, entailing multi-sectoral and multi-level context in sensitive environment.

The general goal is to support the implementation of Blue Growth objectives, and specifically of EUSAIR objectives through an Ecosystem Based approach as required by the Directive on Maritime Spatial Planning 2014/89/EU.

The strategy at the AIR level is grounded in the identification of different types of management areas, a sort of strategic zoning characterised by specific management objectives reflecting on contextual use-use and environment-use conditions and coexistences (Figure 11, Figure 12, Figure 13).

Management areas of type 1 consider the coexistence of multiple maritime uses in sensitive marine environments. These areas, located beyond territorial waters in high waters, are intensively used, entailing sectors and responsibilities in charge of International bodies.

They deserve specific planning and management options based on a transboundary governance structure to be tailored according to future demand of space, to anticipate possible conflicts and to enhance synergies. International and National Institutions should be involved as the scale and levels of responsibility encompass multiple sectors (Maritime Transport, Fishery and Energy sectors in all areas) at multiple scale (International, European, National and local).

These areas are also characterised by relevant environmental characteristics, which should be considered.

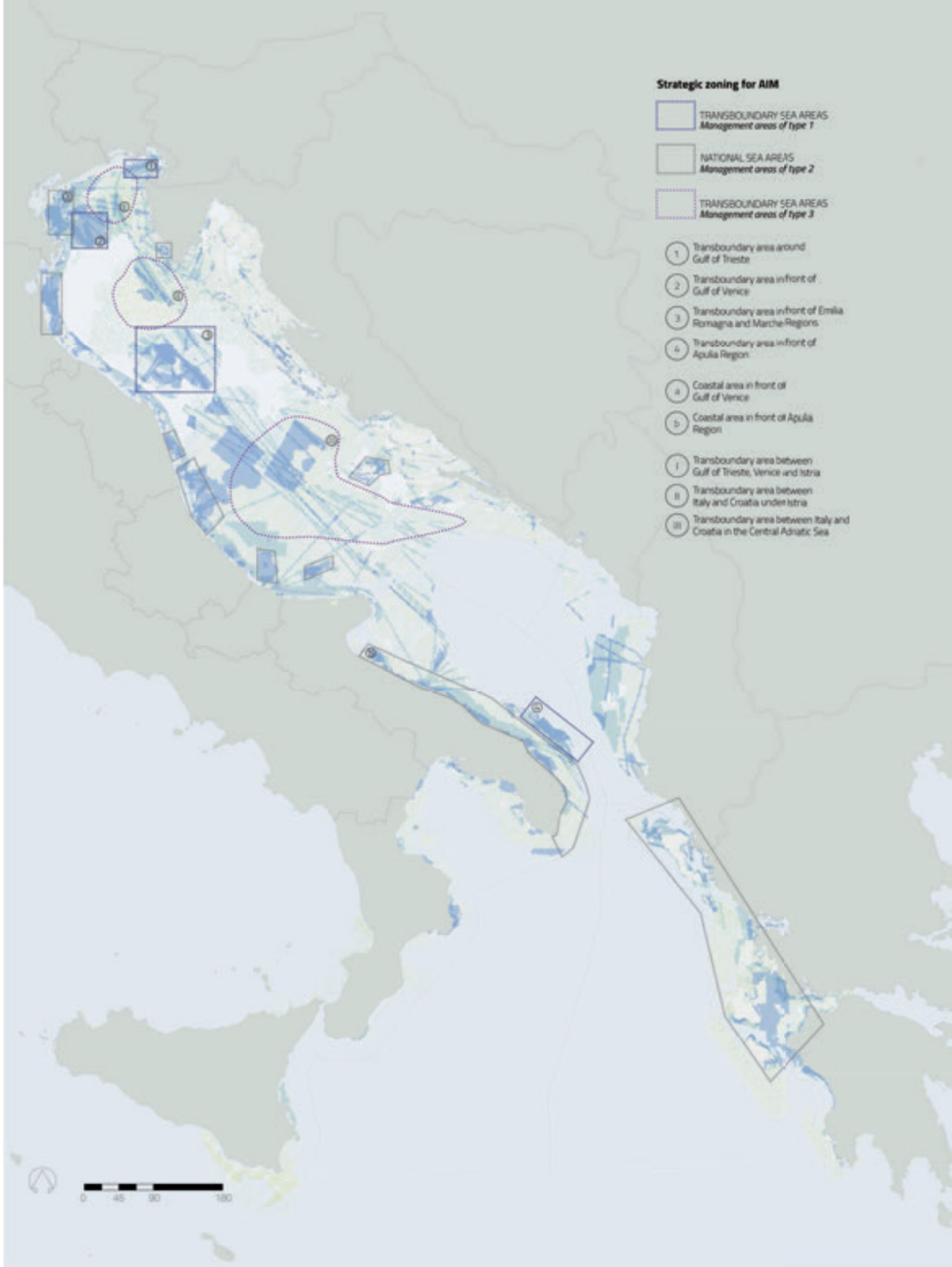
Management areas of type 2 are those areas, which differ from type 1 as they are located in territorial waters, so the governance system should consider a National legal framework at the core of a possible management strategy in relationship with regional planning systems.

These areas are intensively used and present environmental challenges with respect to the effective allocation of maritime uses in synergies between them and with ecological features.

Examples of measures implementation are reported for Focus Area 1 and 2. Further measures are also indicated as possible future implementation of MSP at regional level.

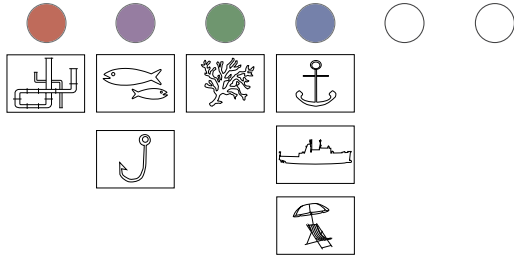
Management areas of type 3 are those areas, which assume a great importance for the delivery of ecosystems goods and services for the AIR. They only partially see the presence of intensively used areas, and they can host maritime uses and activities, which are planned and managed in synergy with environmental assets.

They cover transboundary areas, including high waters, and they entail the establishment of a transboundary governance framework for their planning and management. Measures of compensation at AIR level can land in those areas.



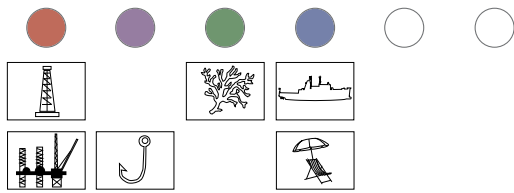
11. Strategic zoning for the AIR.

Transboundary area around Gulf of Trieste



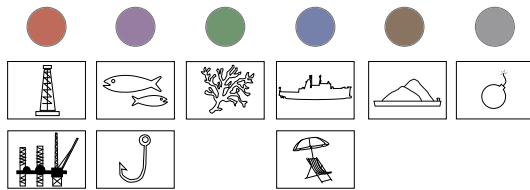
- Energy cable IT-SL
- Small scale fishery
- Aquaculture
- Natura 2000 site
- Biological Protection Zones
- Trieste and Koper Ports;
- Maritime Transport and traffic lanes;
- Maritime and coastal tourism - Ferry routes
- Maritime and coastal tourism - Marinas

Transboundary area in front of Gulf of Venice



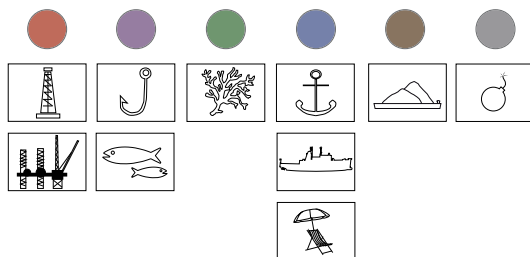
- LNG Terminal
- HC exploitation and bottom trawling
- Pelagic and bottom trawling
- Persistence of nursery areas for commercial species
- Hard bottoms (Tegnue)
- Maritime transport - Traffic lanes
- Maritime and coastal tourism - Ferry routes

Transboundary area in front of Emilia Romagna and Marche Regions



- Cables and pipelines
- HC exploitation
- Trawling
- Biological protection zone
- Maritime and coastal tourism - Ferry routes
- Maritime transport and traffic lanes
- Sand extraction

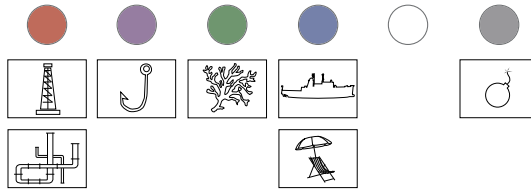
Coastal area in front of Gulf of Venice



- LNG Terminal
- HC exploitation
- Aquaculture
- Small scale fishery
- Trawling
- Biological Protection Zones (Tegnue)
- Persistence of nursery areas for commercial species
- Maritime transport and traffic lanes
- Maritime and coastal tourism - Ferry routes
- Naval base activities
- Offshore sand deposit
- Military areas

12 Synthetic description of strategic areas in the northern part of AIR. See also the table below.

Transboundary area in front of Apulia Region



- HC exploitation
- HC research
- Renewable energy 2020
- Ecologically or Biologically Significant Areas (EBSAs) under the Convention on Biological Diversity identified in the area
- Cables and pipelines
- Trawling
- Maritime transport
- Maritime and coastal tourism - Ferry routes
- Military areas (danger zones)

13 Synthetic description of strategic areas in the southern part of AIR.

Examples of management areas in the northern part of the AIR

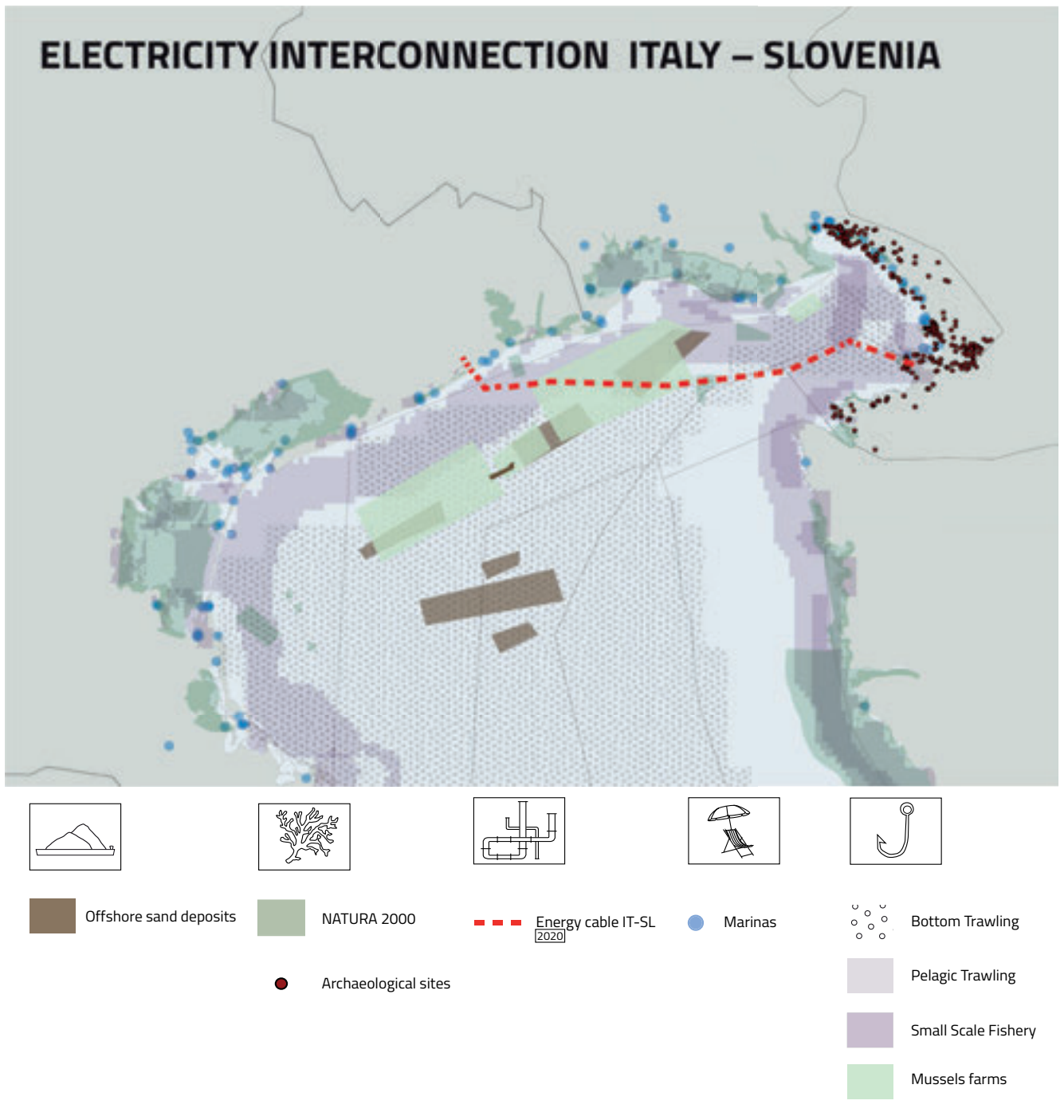
Transboundary area between Gulf of Trieste, Venice and Istria			
Environmental components	Relevant environmental characteristics/dynamics	Current maritime uses and their interaction	Future maritime uses and their interactions
Maerl beds Coralligenous communities	Persistent nursery areas for commercial species	Coexistence among intense fishery activities, aquaculture and sand extraction Presence of Natura 2000 sites and Biological Protection Zones	Development of energy infrastructure strategically relevant in a transboundary perspective Intensification of Maritime Transport and Tourism
Management Area of Type 1 - Coherent with the identification of Ecologically or Biologically Significant Areas (EBSAs) under the Convention on Biological Diversity			
Transboundary area between Italy and Croatia under Istria			
Environmental components	Relevant environmental characteristics/dynamics	Current maritime uses and their interaction	Future maritime uses and their interactions
Posidonia oceanica meadows	Persistent nursery areas for commercial species Macrozoobenthos of peculiar characteristics deriving from a sediments conditions related to the presence of the ancient Adriatic coastal line	IT-HR transboundary issues related to Fishery Intense sand extraction activities	Relevant for future energy exploitation especially towards Croatia waters to be managed coherently with others blue economy issues and EUSAIR Intensification of Maritime Transport and Tourism
Management Area of Type 3 - Coherent with the identification of Ecologically or Biologically Significant Areas (EBSAs) under the Convention on Biological Diversity			
Transboundary area between Italy and Croatia in the Central Adriatic Sea			
Environmental components	Relevant environmental characteristics/dynamics	Current maritime uses and their interaction	Future maritime uses and their interactions
	Persistent nursery areas for commercial species of demersal fish and shellfish	Coexistence among intense fishery activities, aquaculture and sand extraction	Development of energy infrastructure strategically relevant in a transboundary perspective Potential development of HC exploitation areas along the coast Potential development of offshore wind farms Intensification of Maritime Transport and Tourism
Management Area of Type 3 - Coherent with the identification of Ecologically or Biologically Significant Areas (EBSAs) under the Convention on Biological Diversity			

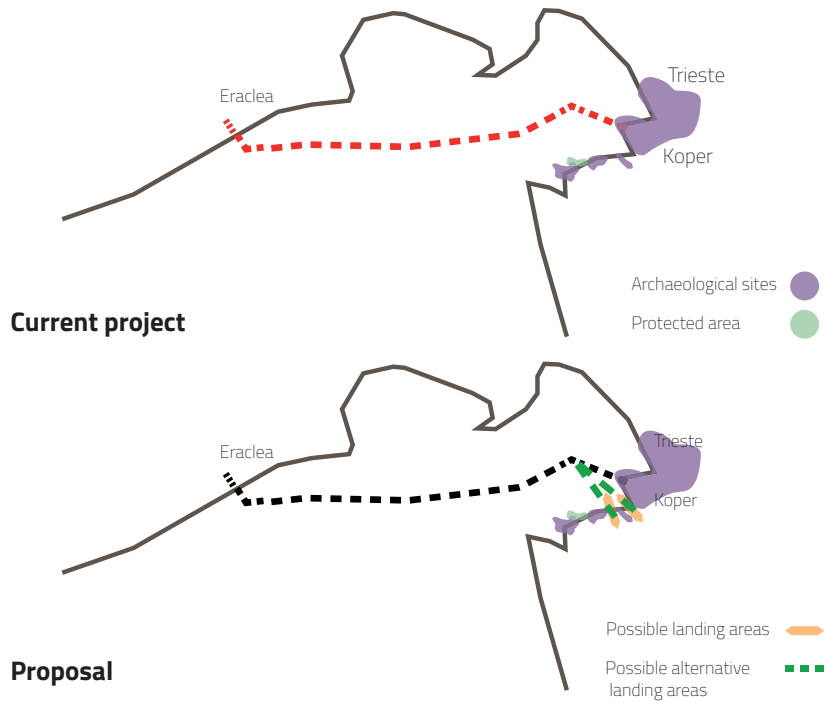
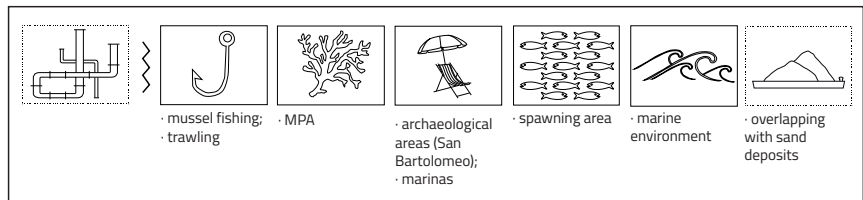
2. Focus Area 1

Pilot actions have been identified and preliminarily developed in Focus Area 1, as examples of problems to be tackled through MSP. They will eventually become measures of the future plan. Their drivers are the energy and maritime transport sectors, while several interactions with other uses are involved.

Pilot Action 1. Electricity interconnection Italy – Slovenia through a submarine cable.

14. Electricity interconnection Italy – Slovenia through a submarine cable.





15 Electricity interconnection Italy – Slovenia through a submarine cable.

Planning objectives

- Regulate potential interactions on sensitive environmental components in the phases of construction and operationalisation;
- Minimise potential negative impacts on protected sites (Trezze di San Pietro and Bardelli);
- Minimise negative interactions with economic activities related with fishery on the seabed;
- Regulate interactions on touristic areas along the Veneto and Slovenian coasts;
- Take into consideration underwater archaeological sites in the areas of Caorle, Grado, San Bartolomeo and their heritage value.

Proposed actions

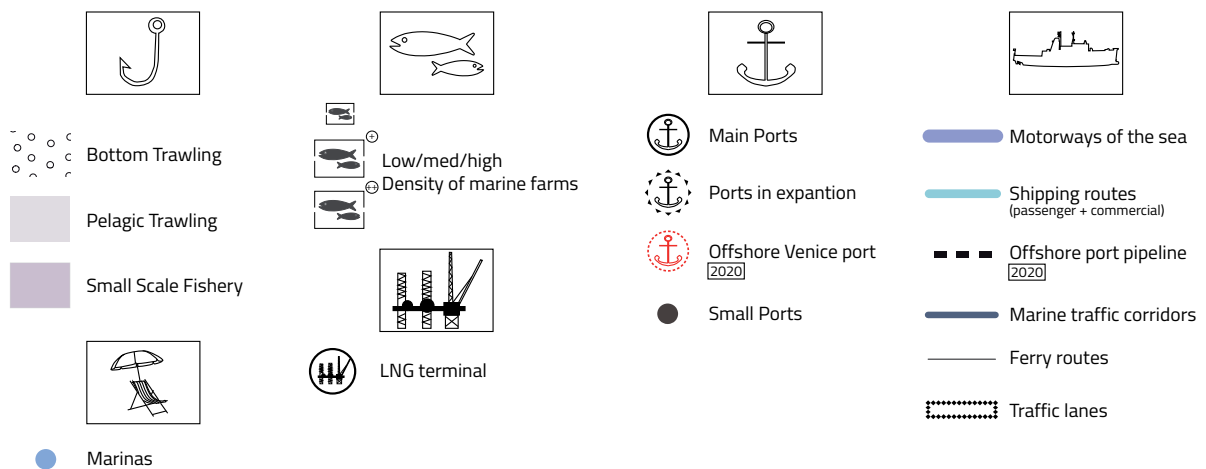
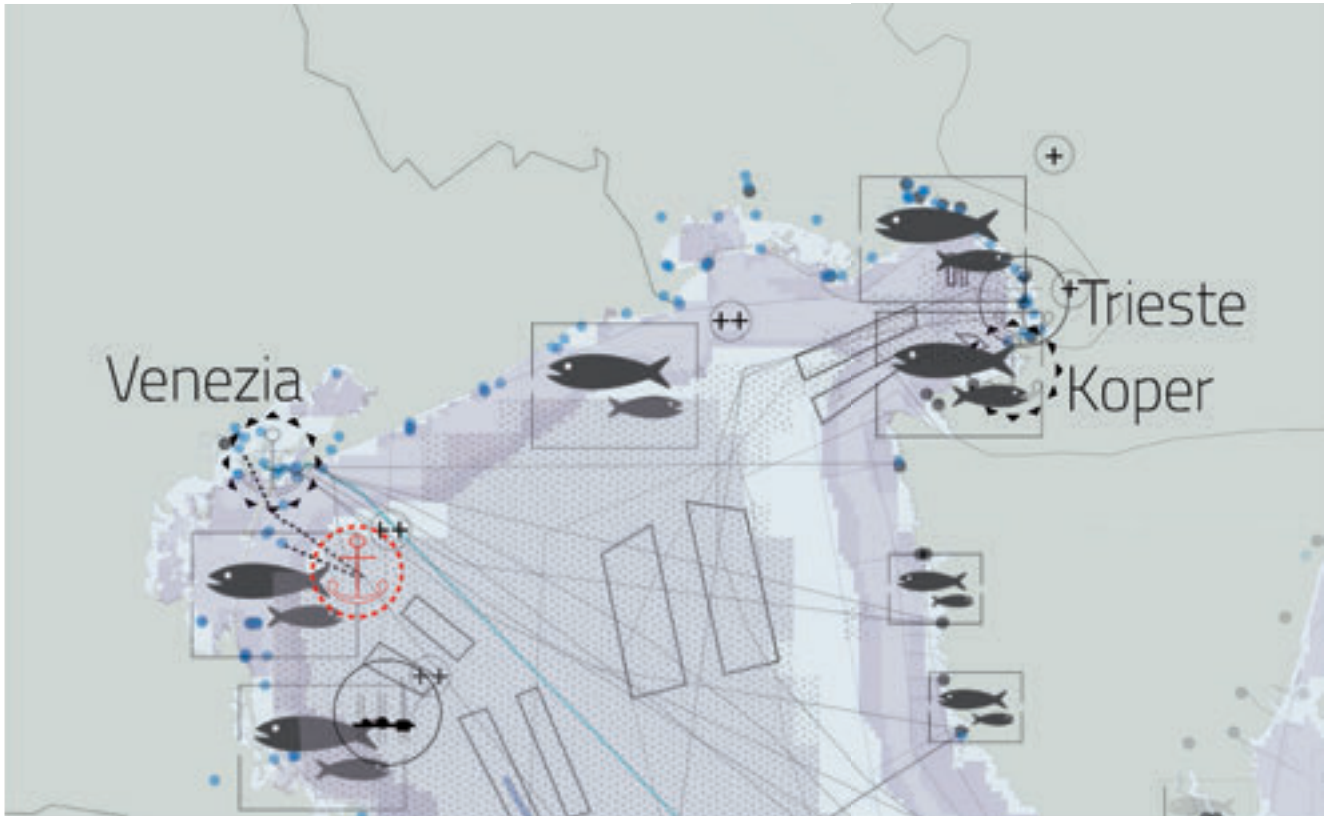
- Place the position of the cable towards Croatian – Slovenian borders in a larger buffer zone in order to permit adjustment in the execution of the project, to limit interference with fishing routes;
- Adjust the position of the cable to minimise impacts on Natura 2000 sites;
- Deploy the cable under the seabed to limit possible damage due to trawling fishing activities and to anchorage;
- Modify the land – sea connection in the eastern part of the project to reduce conflicts with mussel farming and with underwater archaeological sites.

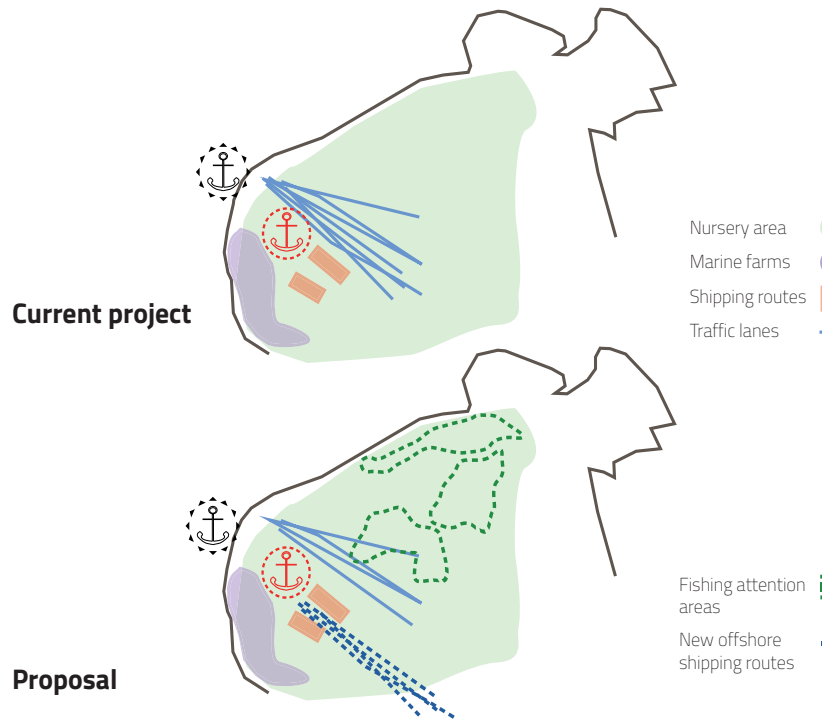
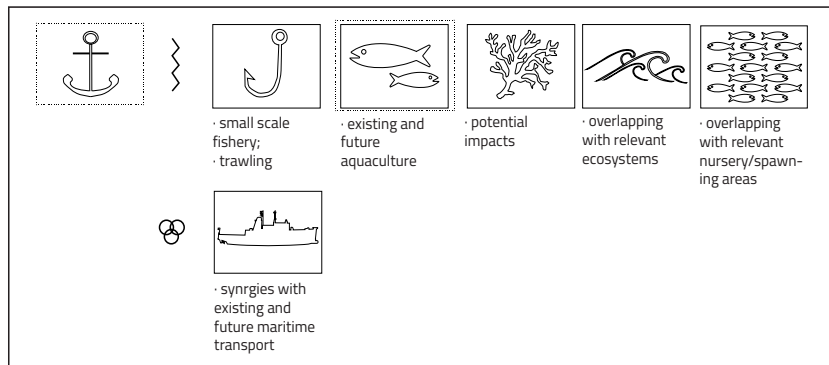
Stakeholders

- Transmission System Operator ELES (SI), Terna (IT);
- Italian Government – Italian Ministry of Economic Development, Slovenian Government Ministry of Infrastructure, Slovenian Ministry of Culture;
- Italian Regional Governments (Veneto Region, Friuli Venezia Giulia Region): - Cultural Heritage Department, Environmental Protection Department – Energy Department – Fishery Department;
- Local Stakeholders: fishing cooperatives, Directorates of Natura 2000 sites, diver associations;
- ARPA Veneto, ARPA Friuli Venezia Giulia, Coast Guard, ARSO Slovenian Environmental Agency.

Pilot Action 2. Venice Offshore Terminal

16 Venice Offshore Terminal





17. Venice Offshore Terminal

Planning objectives

- Need to preserve nursery and spawning areas in the medium-long run to guarantee economic sustainability of fishery;
- Need to control the impacts on sensitive environmental components during the different stages of realisation of the Venice offshore terminal;
- Need to reduce conflicts with the fishing sector, identifying compensatory measures to be implemented according to a time plan dependent on the specific stage of project realisation.

Proposed actions

- Definition of temporary precautionary measures during the phase of offshore construction;
- Identification of spatial compensatory measures to mitigate environmental impacts on fish nursery areas, on relevant ecosystems and conflicts with fish farming activities;

- Compilation of a draft containing compensatory measures to be developed during the different phases of the Venice Offshore Terminal construction (excavation, dredging, handling and laying of the material until the commissioning of terminal). The measure has to guarantee the long-term economic sustainability of fishery.

Stakeholders

- Italian Ministry of Transport and Infrastructures, Italian Ministry of Environment;
- Venice Municipality, Venice Port Authority, Coastal Guard;
- ARPAV, Fishing category associations.

Pilot Action 3. Development of infrastructures in the Port of Trieste

The recently approved plan of development of the Port of Trieste includes a wide range of works involving maritime space, possibly interacting with other maritime activities and having possible impacts on the environmental status. These projects include (Figure 18):

- The enlargement of the pier dedicated to cruise ships in order to allow docking of the most recent cruise ships;
- The execution of a new touristic marina in the city centre;
- The enlargement and also unification of some piers in the industrial port (leading to more than doubling the current pier surface);
- The construction of a new pier and of a logistic platform;
- The construction of a new Ro-Ro terminal;
- The construction of coastal infrastructures to promote yachting activities;
- Dredging areas.

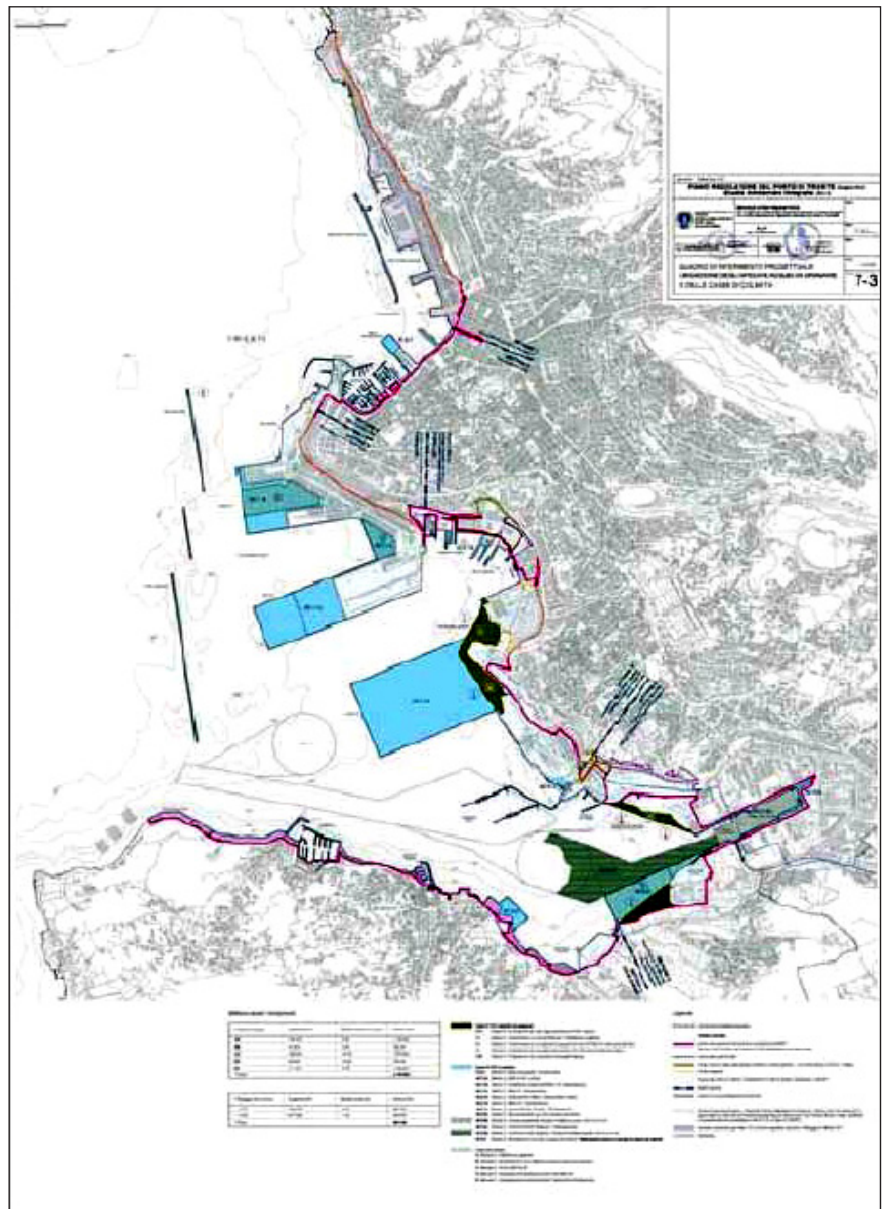
The area included in the plan of development occupies a Site of National Concern (SIN, Trieste) with a total area of 1,700 ha, of which 1,200 ha are in the sea. The site is characterised by hydrocarbons and heavy metals pollution due to past long-lasting refinery activities, which have contaminated the sediments inside the harbour.

The entrance corridor to the commercial port and to the oil terminal passes in front of the historical village of Muggia and in front of a coastal area dedicated to tourism and recreational activities. The southern coast, close to the Slovenian border, is used also for aquaculture with several mussel farms.

Main management objectives and suggested measures are as follows:

- Definition of measures to reduce acoustic pollution;
- Measurements to preserve water resources;
- Measurements to preserve the marine environment;
- Definition of suitable monitoring project to assess possible environmental impacts during the construction phase and to assess possible environmental impacts during the operation phase;
- Definition of mitigation and compensation measures:
 1. special precautions to reduce impacts of sediment resuspension and dispersion during dredging, and deployment of infrastructure to reduce possible dispersion of contaminants;
 2. definition of adequate timing of operations to reduce interference with the touristic season;

18. Projects of development of port infrastructures in the Port of Trieste (Italy). Source: PIANO REGOLATORE DEL PORTO DI TRIESTE. Giugno 2014, Relazione Generale.

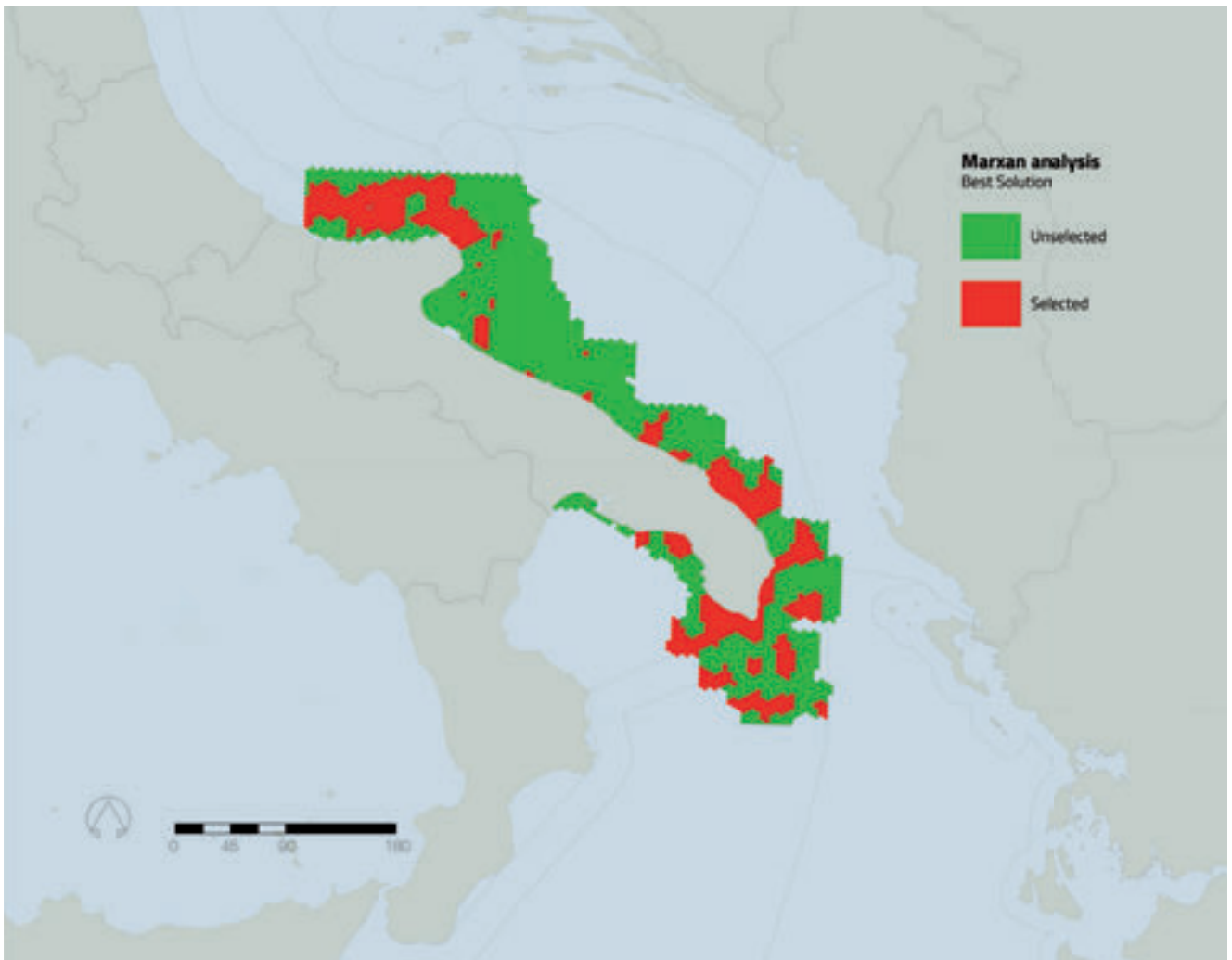


3. adoption of "IMO Ballast Water Management Convention" (IMO, 2004) to limit possible NIS introduction;
4. confine activities to avoid interference with seabeds of phanerogams and other relevant seabed habitats;
5. definition of routes to approach the harbour and limitation of speed to limit possible impacts on marine mammals.

Maritime Spatial Planning (MSP) aims to achieve simultaneously social, economic, and ecological objectives by means of a more rational and scientifically based organisation of the use of ocean space.

By balancing multiple objectives and sectorial priorities, an integrated maritime spatial plan allocates space for different human uses, informed by knowledge of ecosystem processes and function, and consultation with stakeholders across different sectors and interests.

The above approach was applied in ADRIPLAN and outcomes referring to FA2 appear in the following sections.



3. Focus Area 2

19. Best solution from MARXAN analyses.

Pilot Action 1. Apulian territorial waters

In the Italian territorial waters of FA2, several human activities take place determining hot spots of conflicts. The most important areas deserving an MSP effort, also in terms of socio-economic importance (see also Mosetti and Lipizer, 2014; Barbanti et al., 2015), are represented by:

- An area dominated by the presence of the town of Bari, currently highly populated and urbanised. The interactions between naval activities (due to the shipping and cruise port), increasing bathing and nautical tourism, cables, small fisheries and trawling, close to widespread Sites of Community Interest (SCIs) (covering the extension of large *P. oceanica* meadows) are the main causes of the present high level of spatial conflicts.
- An area surrounding Brindisi: although there are still widespread natural areas, Brindisi coastal area is highly populated by urban settlements and facilities, industrial areas, a carbon power plant (Cerano), a big shipping port, and a seaside tourist flow steadily increasing over the last 10 years. The Marine Protected Area "Reserve

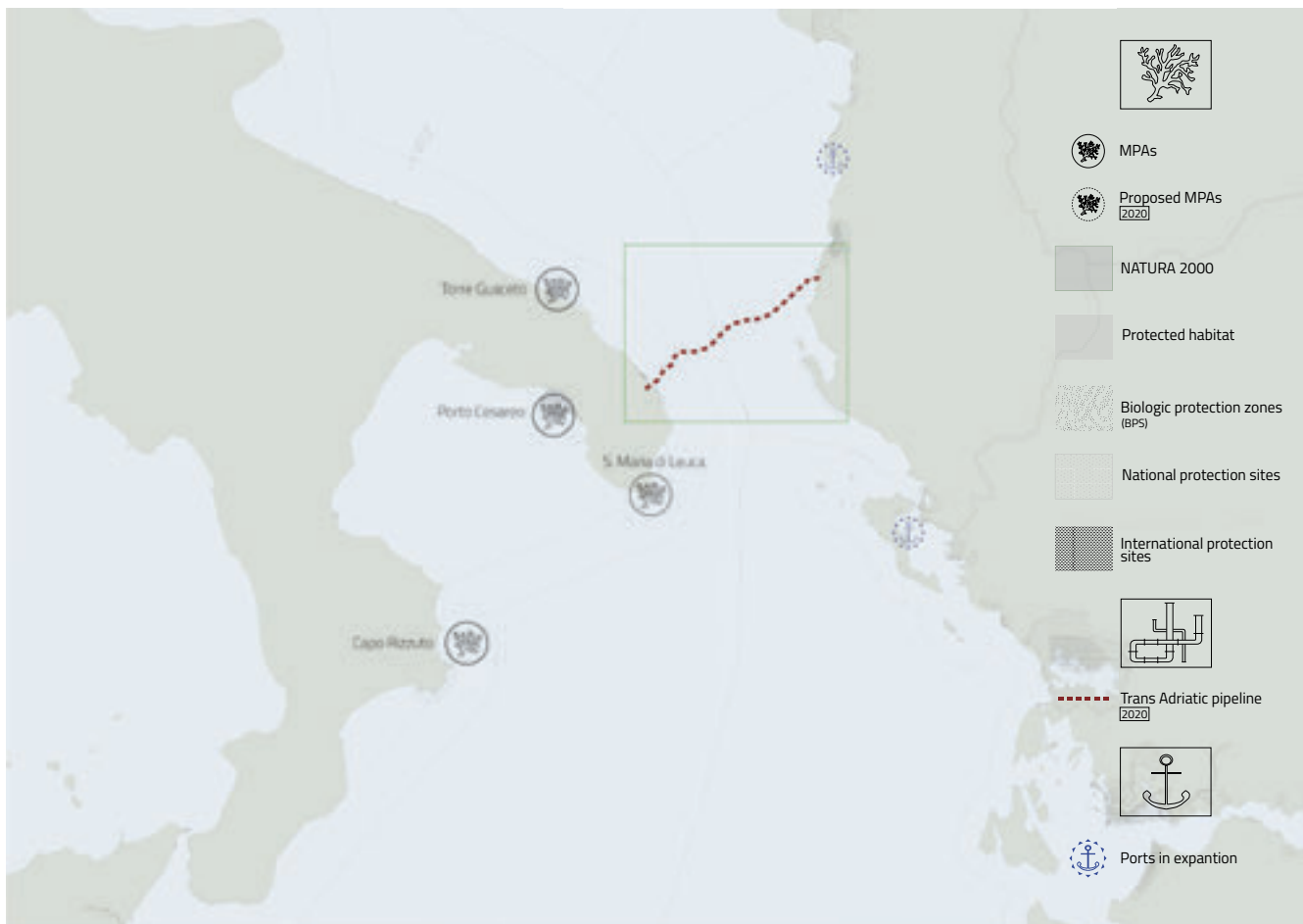
of Torre Guaceto” is also present in this area. The MPA represents a critical tool for the protection of marine biodiversity and the local management of marine resources, and fishery is strictly regulated through bottom up approach. Several SCIs are present in this area, deserving urgently a management plan together with a rezoning effort carried out at regional level. Hydrocarbon exploration and exploitation are also present offshore the area, stressing the need for an integrated MSP preserving the vocational characters of the different coastal areas.

- An area located in the coast of the Lecce town (“Marine leccesi”). Here, the coast consists mostly of soft bottoms with critical erosion necessitating coastal defence works. The main activities in this area are small-scale fishery and trawling interacting with a massive bathing tourism flow.

On the whole Apulia territorial waters and coastline, the GIS-based MARXAN tool (Ball & Possingham, 2000) was employed to offer best scenarios of spatial optimisation by using a priori identified conservation targets of most critical habitats combined with the analyses of current and emerging human activities in the Apulian coastal zone. Here, the new scenarios of protection provide a new foundation for Ecosystem-Based Management that integrates the human dimension.

The Best Solution representing the most suitable scenario in term of cost effectiveness and habitat protection target, between different solutions produced by the analyses, is shown in Figure 19.

20. The planned Trans Adriatic Pipeline (TAP) cable reaching the Apulian coast.



The southern trait of Apulian FA2 appears to be a very low conflict area both in the 2014 and 2020 analyses. This suggests major attention to a proper protection of this area, featured by high summer tourism and low pressure of traditional small-scale fisheries, through the institution of a well-enforced MPA.

The local management plans should be empowered so to decide when, where and how to further develop new human activities: this is also culturally relevant with an improvement of the tools and the effort of fishery through a bottom-up approach.

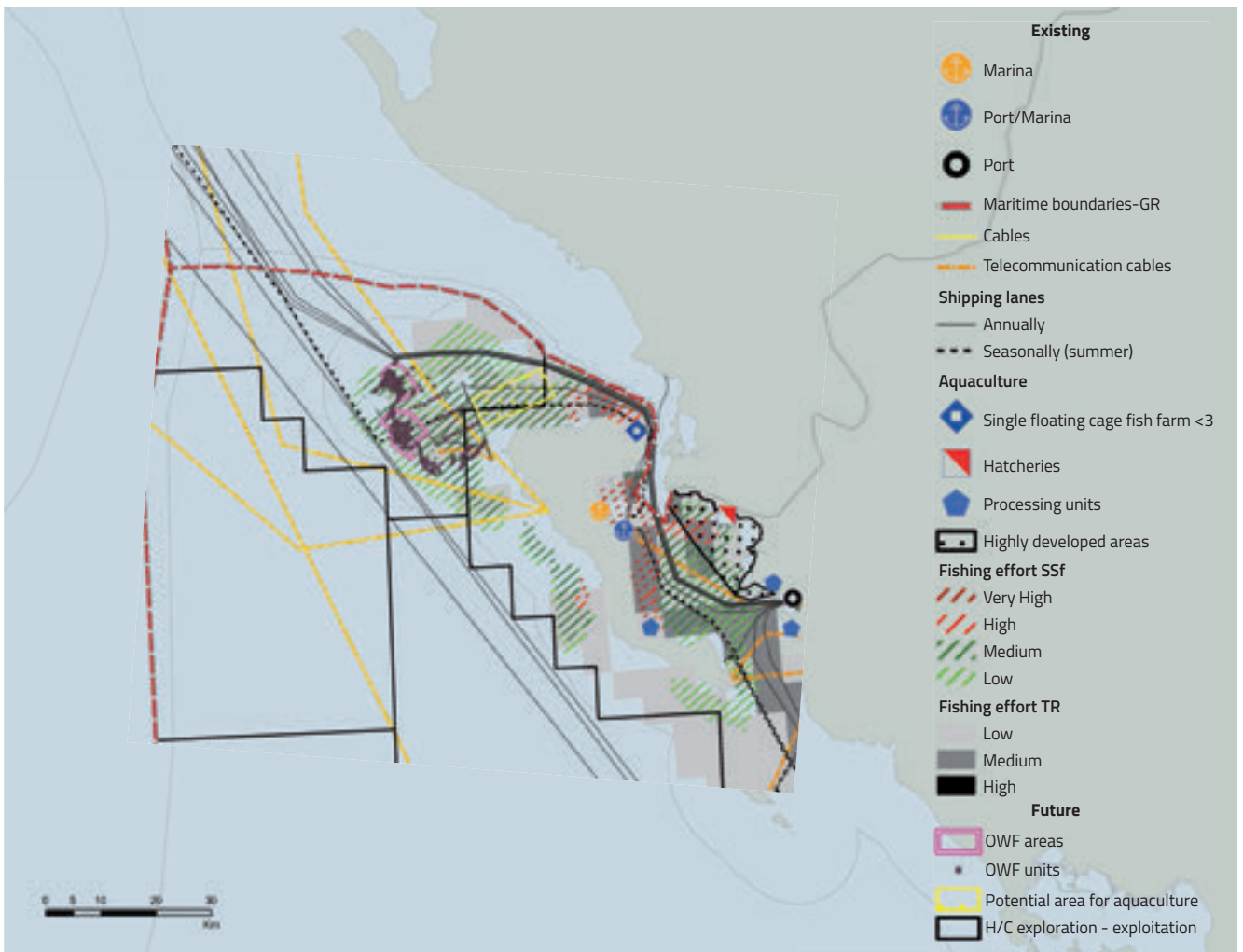
Pilot Action 2. Apulian off-shore waters

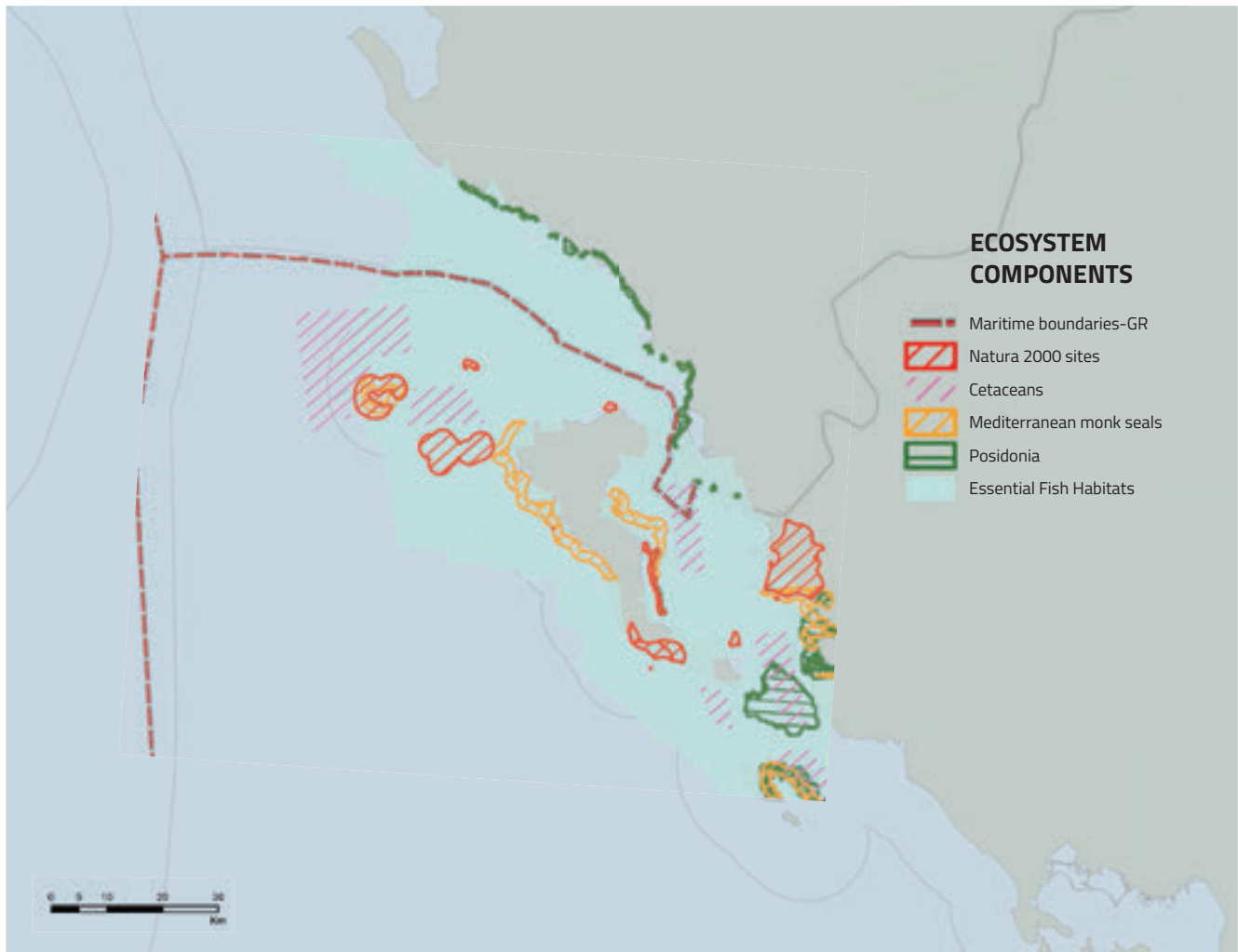
In the Apulian part of FA2, apart from the existing activities, conflicts with energy infrastructures can be boosted in the next years.

The new area of conflict emerging is due to the planned Trans Adriatic Pipeline cable reaching the Apulian coast (Figure 20) slightly north of the city of Otranto.

Moreover, hydrocarbon exploration authorisations are heavily increasing along the whole Apulian coast. Conflicts with energy infrastructures can be merely spatial (e.g. spatial limitations for trawling due to pipelines) or can have greater implications. In fact, recent pressure for surveys for oil and gas using acoustic technologies is considered an area of heavy conflict with

21. Main activities in the Greek part of FA2, both current and potential/future.





22. Key ecosystem components in the Greek part of FA2.

fisheries, since technologies such as air guns may have serious impacts on different ecosystem components, especially on fish stocks.

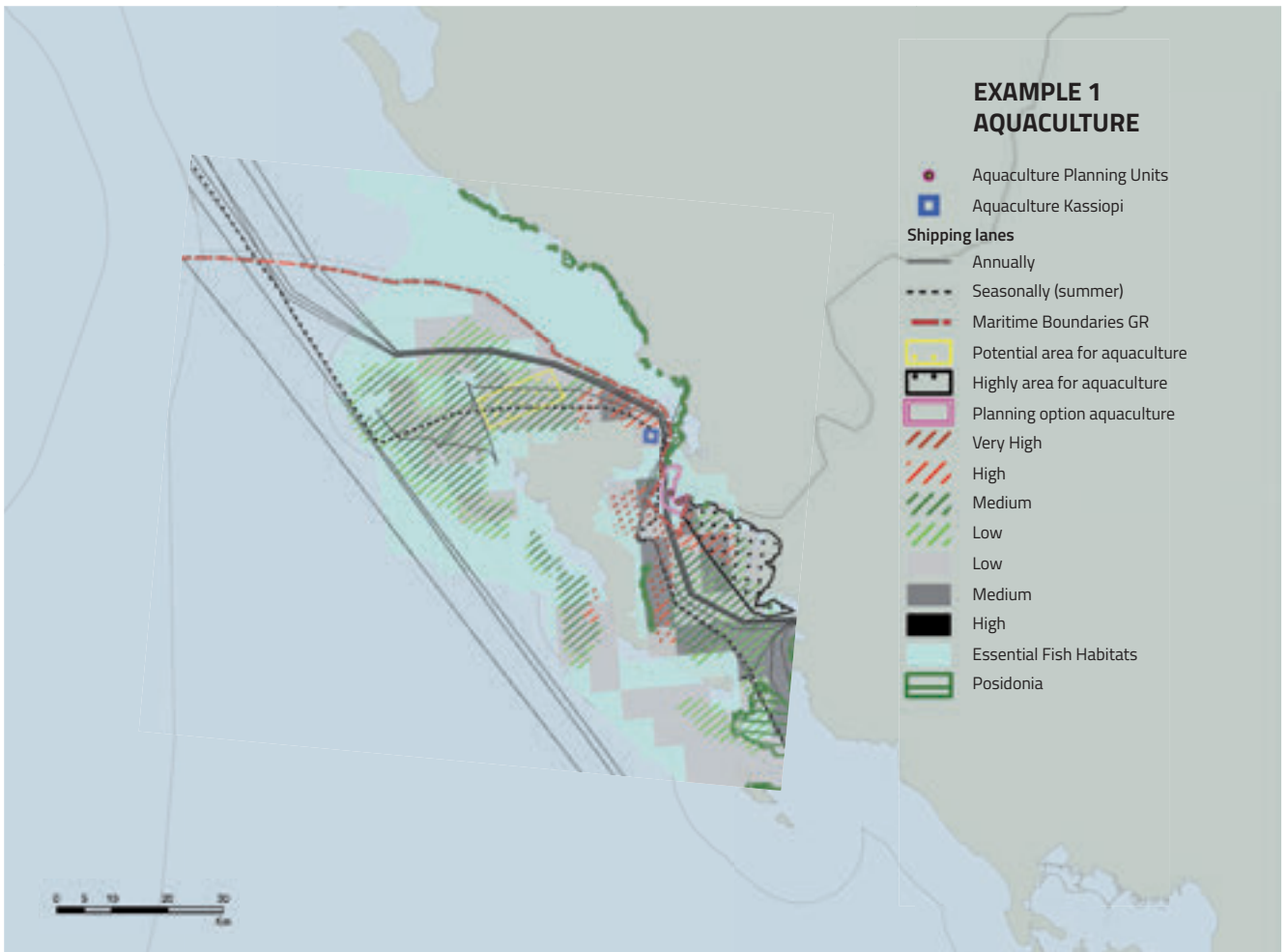
It is important to consider the “vocational” characteristics of this coastal area, including tourism and leisure, in order to conclude that it should not be considered for energy development. On the contrary, coastal areas already dedicated to industrial development might be considered for offshore wind farm implementation.

Pilot Action 3. Greek territorial waters

In the Greek territorial waters of FA2 different types of human activities currently take place, seven of which have been identified as major in terms of their socio-economic importance in the area (see also Mosetti and Lipizer, 2014; Campostrini et al., 2015).

These activities are bottom trawling, small scale fishing, aquaculture, ports, marinas, shipping lanes, cables, and they are mapped in Figure 21. As for 2020, apart from the abovementioned activities, two more (i.e. offshore wind farms, and hydrocarbon exploration and exploitation) are forecasted to take place in the locations designated in Figure 21.

With respect to ecosystem components, five are considered of high importance; namely essential fish habitats, Natura 2000 sites, sea grass meadows, Mediterranean monk seals, and cetaceans (Figure 22).



Pilot Action 4. Aquaculture: examples of cross-border planning issues in the Greek and Albanian territorial waters

Aquaculture is a flourishing sector in the AIR and its importance in the economic growth of the area is vividly highlighted under the EUSAIR Pillar I: Blue Growth. Greece has already a well-developed aquaculture activity, and the highest production in relation to the other AIR countries (source: <http://www.medmaritimeprojects.eu/section/med-iamer-redirect/outputs>). A number of units are placed in the Greek Ionian Sea, few of which are close to the transnational waters with Albania.

The latter country has a rather limited development of aquaculture, but substantial progress has been made in recent years, particularly in the southern part close to the Greek border.

Within ADRIPLAN and particularly through interactions between Greek and Albanian stakeholders, an area of potential cross-border collaboration for future development has been identified (Figure 23).

However, precise designation of the cross-border AZA between Greece and Albania is needed. Development of cross-border collaboration urges for bilateral policy agreements between the two countries.

Finally, the proposed area for cross-border aquaculture development falls within the Corfu strait, where international agreements for navigation/shipping are valid under UNCLOS and should be considered during the elaboration of possible plans.

23. Map indicating areas of existing (black dotted zone) and planned aquaculture sites (yellow dotted zone), and a proposal for cross-border development (purple lined zone).

If you want to build a ship, don't drum up the men to gather wood, divide the work and give orders. Instead, teach them to yearn for the vast and endless sea.

Antoine de Saint-Exupéry (1900 – 1944)

There is no road too long to the man who advances deliberately and without undue haste; there are no honors too distant to the man who prepares himself for them with patience.

Jean de La Bruyère (1645 – 1696)

What we recommend

Capitalising on the experiences gained on other projects, pilot studies and planning activities, and on the results gained and lessons learnt specifically through ADRIPLAN, we are now able to deliver a number of recommendations, customised on the Adriatic–Ionian Region characteristics and needs, to support the practical implementation of MSP in the area.

These recommendations are organised below in the four main and typical phases of the planning process:

- A. Preparation phase
- B. Analysis and interpretation phase
- C. Planning phase
- D. Evaluation, monitoring and adaptive planning and management phase

The four phases, and their recommendations (Figure 24), are not strictly sequential but are in fact, in particular for phases A, B, C, connected in an iterative and adaptive process. The importance of the preparatory phase is in our opinion particularly high and will appear clearly from the recommendations that will follow.

Not all recommendations have the same relevance and applicability, nor the list intends to be exhaustive or to be followed in a step-by-step process. Nevertheless, end-users shall find along with the list of recommendations, answers and advice on most key aspects concerning MSP implementation in the AIR.

Recommendations are presented here in a concise way and a more extended explication can be found in the Report “Developing a Maritime Spatial Plan for the Adriatic Ionian Region” (Barbanti et al., 2015), which presents the main results of ADRIPLAN in a complete and extended form. The boxes report synthetically on ADRIPLAN results directly supporting the recommendation.

A. Preparation phase

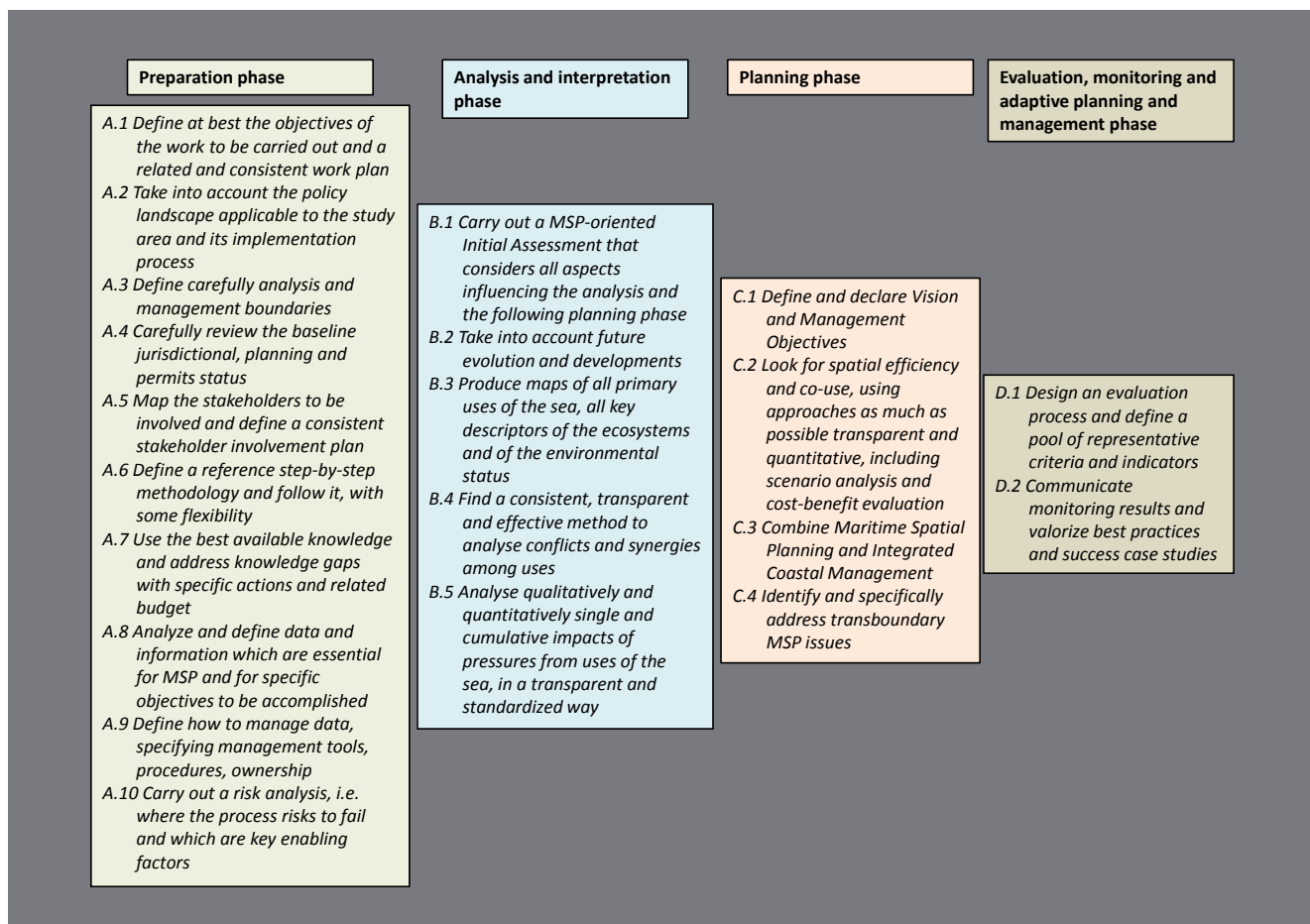
A.1 Define at best the objectives of the work to be carried out and a related and consistent work plan

MSP involves many different aspects and sectors and can be carried out at different levels and scales. It is very important that projects dealing with MSP define their objectives very carefully from the beginning, being them the development of a complete MSP proposal or some specific and maybe propaedeutic actions, and develop their work programmes, time plans and involvements accordingly.

Available resources and mandates to carry out the work should be, in particular, clearly defined, especially when acting in a transboundary context.

Customers, executors and all stakeholders involved have to be aware that MSP is a long-lasting process, and that the final step of reaching acceptability of the plan on the proposed use of marine space and resources usually takes great effort and a long time. Therefore, consistency between premises, objectives and work plan is of great relevance.

Objectives should also be moulded on the characteristics of the study area and MSP requires them to be present. Some needs, and the added value that will eventually result from their satisfaction, should be in many aspects clear from the beginning, as in fact the analysis will define them more precisely and will indicate or provide solutions, while other needs arise during the analysis phase of the MSP process (Cundill et al., 2012; Folke et al., 2005).



24. List of ADRIPLAN recommendations

ADRIPLAN is a Pilot Project and, as such, experienced the difficulty of addressing solutions without having a clear and agreed mandate to do that. ADRIPLAN was then successful in performing a full state of the art analysis of the MSP needs and priorities, while the planning phase remained limited to some examples, despite the full support of many regional administrations. Our experience confirmed that technical approaches and analyses are very important enabling factors but are not per se sufficient, if they are not directly at the service of a clear strategic vision and a political and administrative mandate.

In ADRIPLAN it was clear from the beginning, and was confirmed during the analysis, that in the AIR there is still no convergence in the identification of one or few drivers for MSP, as it may be the case in other areas (e.g. the expansion of a key economic sector, or a focus on environmental protection). The AIR is characterised by a wide and distributed range of multi-uses, which have been grouped in the project in five "pivotal uses", that result in a number of local and mesoscale MSP needs.

Here, as elsewhere, there is, first of all, the need to make clear and evident to local (coastal) Communities that MSP is real life: MSP can bring indeed tangible results to local decision makers.

A.2 Take into account the policy landscape applicable to the study area and its implementation process

MSP should aim at enhancing cross-sectoral cooperation, also through a coherent and coordinated implementation of sectoral policies (Environment, Fisheries, Energy, Transport, Tourism, etc.), without substituting sec-

toral planning.

Therefore, the key policy instruments related to the characteristics of the area should be carefully considered (e.g. MSFD, WFD, Floods Directive, Birds & Habitats Directives, Common Fishery Policy, EU Strategy on adaptation to climate change (COM(2013) 216 final), Directive on renewable energy (2009/28/EC), Directive on safety of offshore oil and gas operations (2013/30/EU), ICZM Protocol for the Mediterranean (Barcelona Convention), etc.).

In particular, the MSFD envisages the elaboration of a Programme of Measures, to be established in 2015 and then again in 2021, to address human activities that have an impact on the environment, in order to achieve Good Environmental Status. This activity should be carefully considered when setting and implementing MSP process, as spatial measures from MSFD implementation are expected to have high relevance within such programme.

Operating in the Adriatic-Ionian Region, the MSP effort must take into account the specific indications from the EUSAIR Action Plan and how the process is being implemented as a whole and through sectoral measures within its four Pillars (see also chapter 2 and C.1). In fact, EUSAIR Action Plan also provides the overall vision addressing management objectives and planning scenarios (see also C.1).

On the other hand, it is expected and recommended that EUSAIR:

- *Promotes the institution of a cross-pillars ICM/MSP permanent working group;*
- *Promotes specific actions and projects on ICM/MSP within the EUSAIR Action Plan framework (in all the Pillars), having in mind a cross-fertilisation strategy among different funding schemes (Interreg, ESI Funds, LIFE, H2020, National Funds, etc.);*
- *Promotes through specific support activities the implementation of the MSP Directive in order to adopt Maritime Plans by 2021 or before that formal deadline.*

To facilitate the process towards MSP and while MSP plans are prepared and adopted, any public and private proponent of projects and plans concerning or affecting the marine environment should be requested to adopt an "MSP approach" when developing Environmental Impact Studies and Strategic Environmental Assessments, starting from providing coherent and usable spatial pieces of information.

A.3 Define carefully analysis and management boundaries

Explicit boundaries should be established to define the domain of analysis and planning. They include the areas of analysis as well as the possible areas of management at the different levels. In fact, according to UNESCO-IOC (Ehler and Douvère, 2009) definition, boundaries can be identified because of two different scopes: "boundaries for analysis", which are meant to include transboundary mechanisms and effects, and to intercept different instances that might influence MSP questions of the case study area; "boundaries of management", on which planning proposals and implementation are elaborated. The two types of boundaries can eventually coincide or the first can include smaller portions of areas defined as "boundaries for management".

The setting of boundaries should be driven mainly by:

- Objectives of the project and the MSP effort (i. e a generic or pilot study addressing specific issues of MSP in the area versus a full plan to be enforced);
- Legal jurisdictions of maritime waters and seafloors and governance;
- Issues related to transboundary and crossborder aspects;
- Maritime uses and economic domains;
- Key environmental components and dynamics.

A major challenge to MSP is represented by the development and implementation of a plan within a context – the maritime one – where both the economic and environmental dynamics have effects, which are hardly limited within the well-defined legal borders.

A substantial lack of well-defined management and regulatory boundaries is often accompanied by disagreements among involved authorities and stakeholders with respect to the planning decisions. The adoption of transboundary planning in a maritime context implies therefore at least four significant challenges and priorities to be implemented:

1) Integrating MSP in existing (land-based) planning schemes

The inclusion of maritime spaces within existing planning systems constitutes a fundamental challenge both at the governance and at the implementation level. It deals not only with the application of a new tool, i.e. MSP, but also with the adoption of a new perspective in approaching both maritime and land-based planning. The integration of MSP in the existing, land-based, planning schemes requires an extraordinary transboundary cooperation effort: planning schemes and planning management systems largely differ from country to country, especially in jurisdiction. Not only competent authorities for planning operate at different levels, but also the overall management of maritime activities is highly fragmented (within and among countries) in terms of competences fields, spatial jurisdiction and regulatory frameworks. Planners should therefore work to face the relevant bottlenecks related to governance and management fragmentation, and support - through the definition of planning measures – the definition of spatially and sectoral integrated actions.

2) Defining shared management and planning boundaries

Notably, the need to adopt a new, sea-oriented, perspective does not only emerge from the need to comply to specific normative provisions (i.e. to the elaboration of MSP plans within 2021), but it is also related to the necessity to solve both use-use and environment-use conflicts. This need has often emerged at a local/regional scale, and has been raised by stakeholders involved in the use/management of maritime and coastal spaces. The necessity to define, at different scales, planning and management boundaries that are shared by different authorities and involved stakeholders is crucial in order to develop a socially and politically accepted plan.

3) Define boundaries capable of embracing ecosystems dynamics

The previously described ecosystem-based approach to maritime spatial planning requires establishing planning measures that consider the specificity of local ecosystems and environmental components. To pursue this objective, a significant effort is needed to overcome the definition of boundaries established only considering political issues related to competence areas (e.g. national boundaries). The overcoming of a traditional approach to boundary definition should necessarily be based on transboundary cooperation.

4) Knowledge sharing

Finally, the definition of integrated MSP strategies and actions should be based on a complete set of data and information and, in more general terms, on a mix of expert, scientific, operative and local knowledge. Acquiring data and information from different sources (including relevant stakeholders) requires an overcoming of science-policy barriers and the fostering of cross-border cooperation with respect to data acquisition and management.

In ADRIPLAN, the definition of boundaries (Figure 1, pag. 13) was carried out following the Initial Assessment phase, where all main MSP-related aspects (legal, planning, uses, environmental) were reviewed. Boundaries took into account specific ADRIPLAN aim and scope, i.e. the definition of boundaries of the Adriatic-Ionian Region and of the two Focus Areas where the analysis and the planning proposal were more detailed. Boundaries were identified to be representative of areas with exemplar transboundary conditions in the AIR.

A.4 Carefully review the baseline jurisdictional, planning and permits status

Activities at sea depend on Laws, Plans and Permits. Legal constraints come from:

- UN Convention on the Law of the Sea (1982);
- International and regional agreements;
- EU Community Laws;
- National and regional Laws.

Among the so-called “maritime zones” wherein one or more States may exercise their jurisdiction, the “high seas” include all waters not subject to national jurisdiction. In the high seas, all states enjoy freedoms, which include: (a) freedom of navigation; (b) freedom of overflight; (c) freedom to lay submarine cables and pipelines; (d) freedom to construct artificial islands and other installations; (e) freedom of fishing; (f) freedom of scientific research.

To be effective, maritime spatial plans should be legally binding (Principle 6 of the EC MSP Roadmap; EC, 2008). As recalled in the MSP Directive (2014/89/EU), “Planning of ocean space is the logical advancement and structuring of obligations and of the use of rights granted under UNCLOS and a practical tool in assisting Member States to comply with their obligations”.

Directive 2014/89/EU states at art.2 and art.3 that “this Directive shall apply to marine waters of Member States, without prejudice to other Union legislation”, whereas “marine waters” means the waters, the seabed and subsoil as defined in point (1)(a) of Article 3 of Directive 2008/56/EC and coastal waters as defined in point 7 of Article 2 of Directive 2000/60/EC and their seabed and their subsoil”.

Therefore, the division of the sea into maritime zones by the UNCLOS will constitute the basis for any MSP activity.

The absence of a general duty to undertake MSP outside EU marine waters and the voluntary nature of this activity, however, does not mean that there are no legal rules that may condition MSP. Rather, there are many legal rules that need to be taken into account when undertaking MSP, at the International and National level. International law of the sea, in fact, regulates the uses of the seas and oceans and provides basic principles concerning, among others, navigation, exploitation of living and non-living resources, protection of the marine environment, the conduct of marine scientific

research and the construction and operation of artificial islands and other man-made structures. Environmental duties are further refined and detailed in a growing number of treaties. All these rules are then incorporated into national domestic legal systems and the EU legal system.

In fact, MSP must address the marine space not falling within national jurisdiction as well, where this is relevant for addressing MSP within national jurisdiction areas; this opens the ground to a relevant and wide discussion on international legal and governance issues. The involvement of international bodies with competence over these areas is essential.

While there is no uniform regulation, EU Member States should interpret and apply existing legislation in accordance with the MSP Directive objectives and requirements.

Working at the AIR scale, ADRIPLAN stressed the need to promote a cross-border / pan-basin approach, not limited to jurisdictional waters, fitted with national / regional constraints and needs. In the short term however, plans will need to limit themselves to areas where coastal States can exercise jurisdiction under current law of the sea rules.

In the long run, legislation should be improved to eliminate the still existing "high seas" areas. In fact, some coastal States have not extended fully their jurisdiction establishing their Exclusive Economic Zones (EEZ) (Albania, Greece, Montenegro and Italy). As a consequence, parts of the Adriatic-Ionian waters still fall under the regime of the high seas, and coastal States do not have any right (or duty) beyond those generally applicable to all states.

In some cases, coastal States have not agreed upon maritime boundaries delimiting their respective maritime entitlements. As a consequence, there are significant areas in which two or more States may advance claims. This is particularly so for Focus area 1, given the present dispute between Croatia and Slovenia on the boundary between the two States. If the dispute is settled, then MSP in the region will need to take the resulting boundary into account.

In some cases, States in the region are bound by different substantial standards relating to activities relevant for MSP. This is primarily due to the fact that not all coastal States are Members of the EU and are therefore not bound by the detailed EU regulations, directives and decisions. While a State cannot be obliged to apply legal rules that do not bind it, there is the necessity to coordinate measures on both sides of the border so as to ensure that measures taken by one State are not undermined by actions undertaken or allowed by the other.

Adriatic-Ionian States are members to a number of global and regional international organisations – such as GFCM, ICCAT, the Barcelona Convention Secretariat – which could provide an appropriate forum, as well as the appropriate institutions and procedures, for the harmonisation of maritime spatial planning, as also prescribed by the MSP Directive (Articles 11 and 12).

A.5 Define a consistent stakeholder involvement plan and map the stakeholders to be involved

Stakeholder involvement is a necessary and critical part of every MSP activity, as widely recognised by the literature and through guidelines and case studies (e.g. Ehler and Douvère, 2009; Schultz-Zehden and Gee, 2013; CZMAI, 2015).

We stress the importance of stakeholder involvement in all phases of the MSP process. However, it can be a time and resource-consuming effort for all parts involved, and it requires a clear commitment and a proactive attitude from public and private stakeholders.

Such effort should be well organised according to a consistent involvement plan, which defines, in line with the specific objectives to be achieved, who should be involved, how the process should develop, which tools should be used and

which resources (not to be underestimated) should be devoted to the activity. Mapping and categorisation of the stakeholders to be involved is the first and very important step of such activity, driving also significantly the following steps. Although the list of stakeholders should be left open and all stakeholders deserve the same attention, it should be clear that stakeholders can be relevant in different ways according to the different phases of planning process; some stakeholders can play a more important role than the others (we can call them “key stakeholders”) in the planning process, because of their role, administrative competence, representativeness, ownership of data, etc. Their proactive involvement will be particularly important for the best results of the project. In a transboundary context, cultural and communication obstacles are not to be underestimated, starting from languages of communication.

Such recommendation was well considered and implemented in ADRIPLAN, carrying out an involvement process that could be summarised in two main steps: awareness and highlighting of main MSP needs; discussion and advice on planning solutions.

The discussion was mainly developed at Focus Area level, through a number of workshops, local meetings, questionnaires and interviews. From the local / regional scales the input from stakeholders has been aggregated first at Focus Area level and then at AIR level, including the transboundary dimension, using the five pivotal uses as tools to organise and guide the analysis. Such distributed method allowed us to convince more stakeholders to invest their time and money in a single, possibly distant, place and a single moment to participate in the discussion.

From this experience, key aspects that need to be taken into account during next steps of the MSP process are the following:

- 1. Cultural: we still need to explain why MSP is needed, how it will add value and why it is worth investing time on.*
- 2. Interest / convenience: to gain attention from stakeholders, key stakeholders and from strong economical sectors, in particular, the MSP process needs a recognised mandate and accreditation.*
- 3. Methodology: effective involvement is more productive if the discussion is developed around pre-identified / developed draft scenarios and planning measures.*

A.6 Define a reference step-by-step methodology and follow it, with some flexibility

Despite a number of approaches to integrated MSP has been developed, a common methodological framework has not yet been established. Furthermore, only few plans have been implemented, most of all referring to different geographical conditions and socio-economic contexts, so that there is a substantial lack of transferable best-practices to be followed in the development of the different phases which composed the adaptive MSP planning cycle.

A step-by-step methodology is needed (Ehler and Douvere, 2009) as a reference to develop the plan and to obtain harmonised and consistent results among different, possibly adjacent, plans. Nevertheless, a quite high degree of flexibility is required in its application, taking into account the characteristics of the study area (i.e. the specificity of local economic and ecological dynamics) and the need to use a target-oriented approach (Schultz-Zehden and Gee, 2013), which can influence the importance of the different steps and the spatial scales.

What is actually important is that the full planning cycle is covered, although

with different intensities and effort, and that basic elements are present (i.e. data gathering and evaluation, integrated assessment, stakeholder involvement, analysis of the compatibility among uses, analysis of impacts on ecosystems, etc.).

The ADRIPLAN methodology (Gissi and Musco, 2015) (Figure 2, pag. 14) is based on a consistent step-by-step approach, and proved to be effective in developing the Pilot Study and accomplishing the main project results. We suggest following the same kind of methodology for further developments on MSP in the AIR, customising and tailoring it on specific contexts and objectives (i.e. use of specific tools to address and evaluate sectorial needs or local aspects).

A.7 Use the best available knowledge and address knowledge gaps with specific actions

MSP needs a continuous science-policy dialogue and promotes scientific networking and clustering. Only the use of best available knowledge can bring to a transparent, robust and adaptive ecosystem-based management.

Bridging science-policy interface is a challenge, which entails the issue of operationalisation between analytical thinking and strategic thinking.

Collaboration between scientists involved in the analysis with decision makers and planning team is a main issue. Such collaboration and exchange of knowledge should occur at a level of interdependency (Costandriopoulos et al., 2010; Cvitanovic et al., 2015), recognising that all participants in knowledge exchange, be they producers, users or intermediaries, have their own experiential knowledge that can contribute to a successful process.

Today planners, who traditionally dealt with the transformation of cities, territories, environments and related issues, must face new marine challenges, and therefore play a fundamental role. Though for years the planning system has 'turned its back to the sea' it is pivotal in organising and developing coastal areas beyond the ICM approach. The sea is affected by economic, social and environmental changes and, in order to cope with the continuing social and economic evolution, it needs to be included in planning and land management strategies. Knowledge is needed in MSP as:

- Conceptual and methodological approaches;
- Knowledge of system functioning at different spatial scales and with time;
- Data and tools to support decisions.

Several research agendas (e.g. JPI-Oceans, 2015; BLUEMED, 2015, SEAS-ERA, 2013) are addressing the issue of the contribution from R&I to MSP in the Mediterranean area and elsewhere.

The evaluation of cumulative impacts in the complex Mediterranean ecosystem requires a peculiar effort. Some information gaps on both pressures (e.g. underwater noise, alien species, emerging chemical, marine litter) and ecological responses (e.g. non linear response to pressures and resilience, adaptation to climate changes) should be filled in, considering also the ongoing MSFD implementation process.

The planning tools, linked to the socio-economic analysis, including a full evaluation of ecosystem services, should be further developed and the integration between "planners" and "marine scientists" further promoted, via concrete projects.

ADRIPLAN recommends working on the following main knowledge gaps to support MSP implementation in the AIR:

- Environmental impacts from maritime traffic (e.g. underwater noise, release of pollutants in the water environment from port infrastructure and ships, alien and harmful species from ballast water) and mitigation measures;
- A more robust and site-specific evaluation of cumulative impacts on ecosystems from natural and anthropogenic pressures;
- Multidisciplinary science to elaborate a climate change adaptation plan of coastal areas at basin / sub-basin scale, taking into account, with a strategic view, all aspects influencing protection and risk and its interference with coastal and marine uses;
- Ecological coherence of protected areas at basin / sub-basin scale, to be achieved through the proper establishment of networks of MPAs and a better management of potential conflicting uses;
- Co-evolution of natural systems and anthropogenic activities under climate change, to address planning solutions in the medium-long term;
- Impacts of oil & gas search activities on cetaceans, sea turtles and other sensitive species.

A.8 Analyze and define data and information which are really relevant for MSP and for specific objectives to be accomplished

Data are usually not the main limiting factor but are for sure a key enabling factor for a quantitative, conscious (incl. knowledge gaps), transparent MSP process and for MSP implementation and monitoring in time.

This is well recognised also in the MSP Directive (*“Member States shall organise the use of the best available data, and decide how to organise the sharing of information, necessary for maritime spatial plans”*) and in the MSP Support Implementation Strategy (DG Mare, 2015) (*“Marine data must be made more easily usable for planners and a focus should be developed on spatial needs and spatial impacts”*).

Aspects of data relevance for MSP include: types of data needed; data mining; data accessibility; availability of tools to manage, integrate, visualise, process data; responsible use of data.

However, there is a great danger of getting entangled in data collection and data constraints, far beyond the actual need of those data. Therefore, emphasis should be placed on the kind of information, which is essential for the kind of planning that is being undertaken.

Data and information to be collected should be defined as much as possible from the beginning in terms of:

- Data / information typologies;
- Actual data / information availability and accessibility;
- Metadata;
- Spatial resolution;
- Ancillary not spatially based data needed or recommended;
- Expected use of the data;
- Ranking of priority in data collection.

An iterative process should be applied instead than a linear one: data collection will be further improved and refined in recursive steps, according to the actual needs of the analysis/planning/monitoring process.

ADRIPLAN tried to follow this pathway, preparing at the beginning of the project some questionnaires to identify data availability and identifying a number of "priority maps" to be produced on uses and environmental components, in connection with the definition of the methodology for MSP in the AIR. As a matter of fact, a great amount of time has been invested in collecting data that have not been used directly within the project, but on the other hand will remain available for further developments and MSP implementation steps through the ADRIPLAN Portal. On the contrary, the project suffered from difficulties in collecting necessary data such as the environmental components and the socio-economic data, as well as data, which are not collected yet, such as the distribution of dolphins in the Adriatic. A complete and predefined step-by-step methodology will significantly help in addressing the best approach for data mining and data collection.

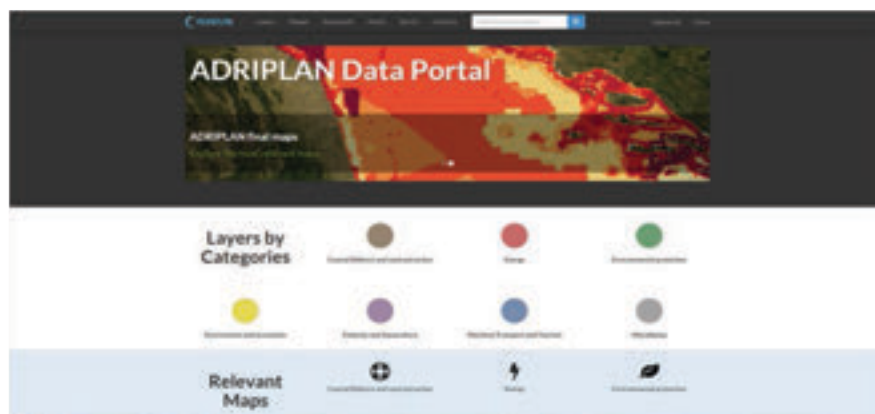
A.9 Define how to manage data, specifying management tools, procedures, ownership

Depending on project objectives (see par.A.1), data management and data management tools can be more or less important and will require different solutions. The existence of tools already available can significantly facilitate the work. This includes not only basic tools to manage spatial data but also tools to carry out specific MSP-oriented analysis (see for example: Stelzenmuller et al., 2012; Center for Oceans Solutions, 2011; <https://publicwiki.deltares.nl/display/MESMA/Home>; <https://ebmtoolsdatabase.org/>).

Within ADRIPLAN, the need of collecting and making available MSP data, providing the maximum level of sharing and dissemination of data and products within and from ADRIPLAN has led to the realisation of the ADRIPLAN Data Portal (data.adriplan.eu; Figure 25). The Portal was conceived not only to support the activities throughout the duration of the project, but also for possible future use within the Adriatic-Ionian Region.

In fact, we suggest to continue using and developing the ADRIPLAN Data Portal, in order to create a EUSAIR permanent ICM-MSP oriented Spatial Data Infrastructure, based on Open Data policies and enhanced co-operation at sea basin level. ADRIPLAN Data Portal can contribute to this goal with its features and peculiarities:

- Integration among database, Web-GIS and customised processing tools;
- Site-specific and dynamic (high resolution, multiple sources, that is actually available);
- Collaborative use (i.e. upload of data and metadata, interactive data processing and map production, potential collaborative development).



25. Home page of the ADRIPLAN Data Portal

A.10 Carry out a risk analysis, i.e. where the process risks to fail and which are key enabling factors

A careful risk management approach needs to be adopted in order to anticipate, manage and solve difficulties during the development of the project. Potential and quite common risks, usually amplified in transboundary contexts, include:

- Data gaps and difficulties in acquiring data needed to develop the assessment and the analysis;
- Poor participation of Stakeholders;
- Difficulties in building a reasonable consensus on management objectives, proposed planning approaches and recommendations, limiting their implementation potential.

The analysis of the difficulties and bottlenecks in the implementation of the MSP plan is a matter that will be treated while discussing and addressing the issue of implementation and monitoring (par. D).

B. Analysis and interpretation phase

B.1 Carry out a MSP-oriented Initial Assessment that considers all aspects influencing the analysis and the following planning phase

Several activities from the preparatory phase address and converge in the preparation of the Initial Assessment that sets the scene, reviewing all aspects that should be considered in developing the MSP plan:

- Policy and legal framework;
- Planning systems;
- Governance;
- Maritime uses and their connection with socio-economy and environment;
- Environmental status.

Main outcomes of this activity, which should not have the ambition to be exhaustive and anticipate the results of further steps of the methodology, should be:

- Define data availability, start data recollection and understand how to have access to the most relevant data (see par. A.8);
- Identify main knowledge gaps and understand how to deal with them (see par. A.7);
- Review, refine and finally establish boundaries (see par. A.3);
- Address the analysis on maritime uses and their relationship with environmental components (see par. B.4 and B.5);
- Address more precisely MSP needs, priorities and management objective in the area (see par. A.1);
- Inform the stakeholder involvement process (see par.A.5).

In order to achieve the goal of a long-term sustainable development, an integrated maritime spatial plan should include a comparison of ecologically relevant information with existing environmental pressures and the impact of the human activities in order to assess the sum of impacts on the marine ecosystem, preferably quantitatively. The EU Member States have been required to prepare such assessments through the implementation of the

EU Marine Strategy Framework Directive (MSFD) (art. 8.b, annex III) “ – an analysis of the predominant pressures and impacts, including human activity, on the characteristics and environmental status of those waters...”. This will facilitate to establish the necessary connection between MSP and MSFD Directives, which is the reference for implementing the Ecosystem-Based Management approach in the marine waters of Member States. The status of the marine environment and the analysis of the anthropogenic pressures should then be carried out as much as possible according to the criteria indicated by MSFD. Same criteria should be used in principle in the definition of planning scenarios and measures. Ideally, this should also guarantee the best matching between the MSP plan and the Programme of Measures of MSFD, due in its first version in 2015.

Key results from the ADRIPLAN Initial Assessment are presented briefly in this report under chapter 3 and in details in the ADRIPLAN Report AIP-1.2-1.1 – Initial Assessment (Mosetti and Lipizer, 2014).

B.2 Take into account future evolution and developments

The construction of a realistic scenario on a 5 to 10 years perspective is needed in order to set the scene for the definition of planning strategies and actions coherently with the likely future development of the planning area. Such scenario is explorative for possible future conditions, should explore possible emerging drivers of change, in relation to raising conflicts and synergies between maritime uses, as well as in relation to emerging pressures and impacts to the environment.

Future conditions in the area depend on:

- Ongoing actions, that have usually a widely differentiated status of advancement (e.g. port developments, new pipelines or cables, new wind farms, new protected areas, etc.);
- Probable/expected changes, due to political and socio-economic cycles and developments (e.g. new countries joining the EU, adoption of new legal/regulatory global economical cycles and trends affecting the maritime economy, etc.);
- The co-occurrence of natural (direct and indirect climate change effects in the area are expected to be relevant) and anthropogenic changes;
- The implementation of structural (e.g. new infrastructures, use on new technologies, etc.) and non-structural measures (e.g. implementation of environmental policies and other sectoral policies, best management practices, monitoring activities, adaptive management practices, etc.) within general and/or sectoral plans.

The important role of climate change, well known and recently reconfirmed by Halpern et al. (2015), which showed how climate change stressors drove most of the increase in cumulative impacts in world's oceans in the period 2008-2013, recommends to establish a strong linkage between MSP implementation and EU / national climate adaptation strategies and measures.

The MSP plan and all related actions and studies should take these scenarios into account, from the basic consideration of their high intrinsic uncertainty. Such uncertainty needs to be addressed through a structured adaptive management process. Of course, the MSP plan can also intervene to build and influence these future scenarios (e.g. CZMAI, 2015), supporting the process toward a clearer vision for the area and its practical implementation.

ADRIPLAN analysed this issue in detail (see for example Figure 21), trying to produce maps of uses at year 2020 for the so-called pivotal uses. During this phase, an important role was played by the Institutional Partners of ADRIPLAN and by all the stakeholders contacted. A significant number of actions cannot be presently translated in or represented on maps, since they are still too undetermined or produce an effect, which is not directly spatially based. However, those actions can be very relevant and have been taken into account as such in the interpretation phase and have been used in particular to produce the maps of foreseen conflicts among uses and foreseen cumulative impacts. As a result, we do not pretend to be precise at local scale, apart from some limited areas, but consider to have grasped all major potential trends and developments at AIR and Focus Area scale:

- Increase in maritime traffic, mostly in Focus Area 1;
- Increase in coastal and maritime tourism in the whole AIR;
- Development of the oil & gas industry;
- Measures to adapt to climate change in coastal areas, varying depending on coastal morphology and use (this theme can be further investigated in relation to land-sea interactions).

B.3 Produce maps of all primary uses of the sea and all key descriptors of the ecosystems and of the environmental status

The maps of the uses of the sea and of the main environmental components are the bricks of MSP. Those maps summarise a number of key elements, while other aspects and information are behind the maps, and must be considered in detail during the analysis and the planning process, de-

As already mentioned in par. A.9, in ADRIPLAN we developed a Data Portal to support the MSP exercise, which aims at remaining and growing as a useful tool for MSP implementation in the AIR. The Data Portal has indeed the purpose to grow as a tool to produce maps for scenario planning (on the example of SeaSketch tools, see <http://seasketch.org>). On the basis of Data Portal information and tools, ADRIPLAN intends to provide maps that effectively “communicate the plan and the research” to stakeholders (on the example of Plan Bothnia, see <http://planbothnia.org>). In order to achieve this goal, the collaboration between Data Portal experts and planning and visual communication experts, is necessary. Data related to the eastern Adriatic are less homogeneous and more difficult to collect than the Italian ones; this is particularly true for data from Albania and Montenegro, due to the fact that ADRIPLAN doesn't have specific partners from these areas. Albania and Montenegro have been anyway involved in the project as observers and their representatives participated in some workshops organised by the project. The Ionian region south of the Focus Area 2 is another area where data were more difficult to be gathered. This is due to the fact that Calabria and Sicily regions were not partners in the project and also that this area has been less intensively studied compared to the Adriatic Sea. Despite these difficulties, ADRIPLAN had all priority maps described at the whole Adriatic-Ionian Region scale, allowing a more detailed analysis at the two Focus Areas. MSP in the AIR is driven by many uses, needs and perspectives. Developing and implementing MSP requires a proper balancing in space, intensity and ways of deployment, taking into account their environmental pressure and their socio-economic relevance. The individuation of “pivotal uses” helped us to address the analysis and planning at basin / sub-basin scale and define planning actions at local scale. Maps of some pivotal uses and of their connection with the environmental conditions have been already presented and discussed in chapter 3 and can be accessed through the Portal.

pending also on the objective of the study (see again par. A.1). The correct interpretation of maps is also very important, with the assistance of complete metadata and taking carefully into account missing data and information.

Harmonisation of formats according to EU and other international standards and interoperability among databases play a crucial role, especially when operating at transboundary scale (see for example Figure 26), not only to build the first picture of the area under study, but, even more important, to have the possibility to maintain, improve and update it.

B.4 Find a consistent, transparent and effective method to analyse conflicts and synergies among uses

The analysis of overlapping maritime activities aims at identifying areas characterised by a high intensity of uses.

The analysis should be able to identify areas where the overlapping occurs, to characterise different typologies of overlapping, as competition for space in time, and to produce a quali-quantitative ranking of conflicts and synergies.

Such analysis should produce both aggregated (at basin/sub-scale) and medium-high resolution (1–10 km scale) indications.

The use of standardised and “objective” semi-quantitative methods, more or less refined, requires to be unavoidably complemented by stakeholders’ indications and expert judgment, to produce the final maps, with aggregated and interpreted information.

ADRIPLAN used for this analysis the methodology developed in the EU-FP7 Project COEXIST, and particularly the spatially explicit version of the method (GRID – Gramolini et al., 2013).

Such quantitative analysis has been then further processed and integrated in the maps of “Synergies and Conflicts” for the five Pivotal Uses, adding stakeholder indications and expert judgment evaluations. Expert judgment allows to also take into account where missing data are influencing the results of the analysis.

The methodology needs to be further refined, including more data and more explicitly taking into account missing data, better understanding the sensitivity to attributes and grid cell resolution, and taking into account the intensity of the uses (i.e. intensity of maritime traffic or of fishing activity), which can be very relevant for addressing planning proposals.

The tool to calculate conflict scores is being made directly available through the ADRIPLAN Portal and is dynamically connected to the data layers of the Portal, allowing the user to develop his own customised simulations (on selected areas, selected uses, different spatial resolutions).

B.5 Analyse qualitatively and quantitatively single and cumulative impacts of pressures from uses of the sea, in a transparent and standardized way

One of the key steps of the so-called Ecosystem-Based Management approach is the evaluation of impacts from anthropogenic pressures, one to one and in a cumulative and ecosystems-oriented way.

The Initial Assessment (see par. B.1) should allow a site-specific compilation of potential pressures and impacts from marine uses (ref. to table 2 – Annex III of MSFD) and their relations with environmental status descriptors (see Gissi, E., Musco, F., 2015. ADRIPLAN Report: AIP-3.1-1.0 – Report on methodology for MSP).

Following this step, a more quantitative evaluation of cumulative impacts using the method proposed by Halpern et al. (2007) and adopted with modifications by several authors (e.g. Micheli et al., 2013; Korpinen et al., 2012; Andersen et al., 2013) should be carried out.

The method presents a number of significant advantages, but also contains several limitations, that are well summarised in Halpern & Fujita (2013): e.g. relative importance of stressor layers, linear response of ecosystems to stressors and resilience, accuracy of sensitivity weights; additive model, historical impacts and current temporal dynamics, 3D, relationship between uses (drivers) and pressures (stressors), connecting to ecosystem services.

Also data gaps on uses and on ecosystems distribution can significantly affect the results at local scale.

For these reasons, once main impacts and impacted areas have been identified, a more precise analysis should be carried out to address planning measures, using specific tools that depend on the subject and the cause-effect relationship to be assessed (models, measures and experiments, expert judgment, etc.).

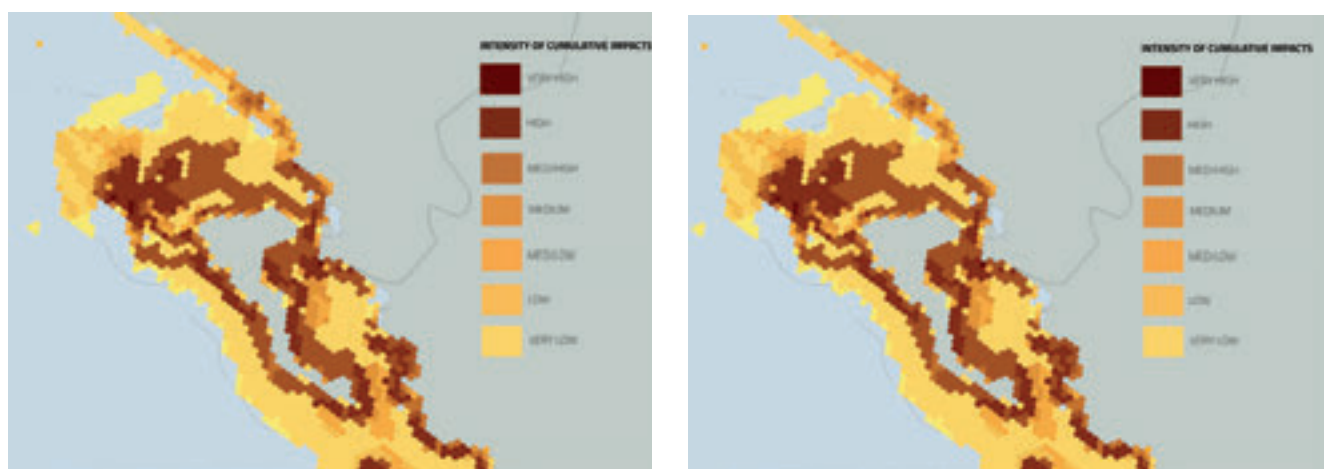
Carrying out this step of the methodology, it is important to properly take into account also pressures that originate on land, up to the watershed scale, where necessary.

The correct evaluation of land-sea interaction, i.e. how land-based and marine-based activities interact each other and influence the marine environment, is explicitly required from the MSP Directive.

In ADRIPLAN we applied the Halpern-based method, producing cumulative impact maps, as described in chapter 3, for the present and foreseen scenario at 2020 (see for example Figure 27). The results obtained are preliminary and need to be further developed and refined (e.g. more robust estimation of sensitivity of environmental components to pressures due to marine uses; area affected by the use and its pressure; effects of missing data; linear and additive model for pressure-effect relationship), mainly in some areas and on some uses, to address at best planning activities. In particular, pressures originated by terrestrially-based drivers need to be explicitly included into the analysis.

Similarly to the tool for evaluating conflicts and synergies, the tool for calculating cumulative impacts is being made available on the ADRIPLAN Portal for diffused and customised use.

27. Map of the Greek part of FA2, showing the results of cumulative impact assessments in 2014 (left) and 2020 (right).



C. Planning phase

C.1 Define and declare Vision and Management Objectives

MSP is just a tool to give reality to a (common) vision of our sea.

The objectives of MSP shall address all of the three major dimensions of sustainability: environmental/ecological, economic, and social/cultural and in general do not differ from the objectives of Ecosystem Based Management.

Before defining goals and objectives for planning the marine space, we need to build and declare a Vision for our planning area. This has to do not only with environmental objectives, but also and mostly with the dynamics of the socio-economic environment, and is clearly projected towards the future. Building a Vision can also require to build and explore different scenarios for your planning area, to make clearer potential alternatives and their consequences (see, for example: Maes et al., 2005; CZMAI, 2015).

The need to formulate clear objectives from the early stages of planning is critical, as the remaining process, from data collection, to decision support, to stakeholder involvement, depends on clarity of purpose (Ehler and Douvère, 2009; Collie et al., 2013; NOAA, 2011; Katsanevakis et al., 2011; Gleason et al., 2010; Stelzenmüller et al., 2013).

The review from 17 coastal and marine spatial plans presented in NOAA, 2011 and Collie et al., 2013 showed that the majority of plans considered started with largely conceptual objectives (e.g., conserve diversity, sustain fisheries). During the planning process, in several cases these objectives were made more operational and spatially explicit, often with the help of an independent panel of experts. This analysis reveals how the development of increasingly operational objectives, spatially based, with indicators and reference levels, is a critical part of the planning process and fundamental to identify outcomes and trade-offs, although very often only partially accomplished.

To be effective and useful for evaluating the management performance of spatially managed areas, operational objectives need to be SMART (ICES, 2005; Katsanevakis et al., 2011): Specific; Measurable; Achievable; Realistic; Time bound.

It is quite clear the very important role of stakeholders in defining vision and management objectives and building consensus around them, especially if operating in a transboundary context.

Luckily, defining a common Vision to address MSP in the Adriatic-Ionian Region is today a relatively easy task, at least as far as the meso and large-scale is concerned. In fact, this Vision is reflected in the process and the documents that are progressively giving structure and life to the Adriatic-Ionian Region and its Strategy (EUSAIR), starting from the Action Plan adopted in 2014 (EC, 2014,a; EC, 2014b).

The Vision at the base of the ADRIPLAN MSP analysis and proposal is derived directly from the EUSAIR Plan and the directly related documents. Ecosystem Based Management (EBM) is a crosscutting issue for all high-level and operational objectives, according to WFD, MSFD and MSP Directive. A number of sectoral and local studies and the results of activities specifically developed in ADRIPLAN (i.e. the Initial Assessment, the Questionnaires and Stakeholder Workshops and related involvement activities) have all been considered to elaborate within the Project spatially based proposals at different scales.

C.2 Look for spatial efficiency and co-use, using approaches as much as possible transparent and quantitative, including a comparison among alternatives and a cost-benefit evaluation

MSP proposals should look for the maximum co-use of marine areas, defining areas of no-use or single sector use only when strictly needed. The process to define and regulate such co-use should be transparent and robust, i.e. based as much as possible on:

- Strong stakeholder engagement;
- Reliable spatial data;
- Multidisciplinary scientific involvement;
- Quantitative analysis, including accounting of ecosystem services and cost-benefit analysis comparing alternatives.

To support this effort and the related decision-making a number of tools are available from the literature and from the market (e.g. Centers for Oceans Solutions, 2011). Tools for “Alternative scenario development and analysis” (e.g. MIMES, InVEST, MARXAN) are at this regard particularly useful and should be encouraged.

The preliminary regional strategy for the Adriatic Ionian Region and the examples of pilot actions on Focus Area 1 and Focus Area 2 presented in chapter 4 of this report are based on the spatial efficiency and co-use principle.

ADRIPLAN has also developed a Maritime Socioeconomic Index (MSI), which reflects the significance of each use to the Blue Economy analysing them in terms of their socio-economic value, intensity and flows. The conceptual assessment model can be adapted according to the availability of data and possible spatial and temporal constraints.

Local and sectoral examples of co-use from ADRIPLAN are: positive feedbacks of MPAs, and protected areas in general, on surrounding fishing grounds and fishing activities; co-use of areas for small-scale fisheries and recreational fishery / eco-tourism / coastal tourism; potential synergies between offshore wind farms and MPAs; harmonised space allocation for cruise traffic routes and coastal tourism (cultural, beaches and resorts, etc.).

C.3 Combine Maritime Spatial Planning and Integrated Coastal Management

The MSP Directive states at “art.7 – Land-Sea Interactions”, that in order to take into account land-sea interactions, should this not form part of the maritime spatial planning process as such, Member States may use other formal or informal processes, such as integrated coastal management. Member States shall aim through maritime spatial planning to promote coherence of the resulting maritime spatial plan or plans with other relevant processes.

The implementation of ICZM Protocol under the Barcelona Convention (art.18) also stresses to develop joint / harmonised ICZM/MSP strategies and plans, following the ECAP approach.

It is quite evident that on the one hand, no MSP could be implemented without taking into account the possible ICZM plans that fall under the marine area under regulation and, on the other hand, no ICZM plan can be effective if its impact on the marine uses of the area is not pre-evaluated (see, for example,

Activity	Type	
	Maritime	Coastal
A. Direct socio-economic impact		
Fishing	+	+
Aquaculture	+	
Water Transport	+	
Port services		+
Recreation	+	+
Housing		+
Sand and Gravel Extraction	+	+
Hydrocarbons Search and Extraction	+	
Dredging and Disposal	+	
Renewable Energy Production	+	
Cables and Pipelines	+	
Agriculture		+
Industry		+
Desalination		+
B. Indirect socio-economic impact		
Marine Protected Areas	+	+
Military Zones	+	+
Site of Conservation Interest	+	+

28. Human activities with socio-economic impact (Colgan, 2003; Ehler and Douvere, 2009; Cocossis et al., 2015).

CZMAI, 2015, for an integrated analysis of coastal and marine uses, conflicts, risks, impacts, and a related development of joint planning scenarios). A project should then aim at a good scientific understanding not only of the ecological features of the study areas but also the identification of socio-economic, cultural linkages and connectivity between ecosystems and human activities in the coastal and marine area. More precisely, Figure 28 presents the most frequent uses developed within the implementation area of MSP and ICZM. As can be seen from this table, there are several uses developed in both marine waters and coasts such as fisheries and recreation. Additionally, uses like maritime transport and port services are tightly connected and consequently examining each use separately cannot lead to effective results.

The challenge in coupling/harmonising ICZM and MSP mainly depends on the different rules, competences and motivations determining spatial planning on land, not always easily integrable and reconcilable with what is happening at sea (for example, reduction of pollution loads, urbanisation of the coast, new infrastructures and industrial areas, etc.).

In terms of implementation, so far MSP and ICZM have been different, with ICZM obtaining a more informal and flexible character and MSP, aiming at the development of spatial plans with specific actions, being more legally binding. However, some countries have developed more legally binding approaches for ICZM as opposed to MSP mostly due to the lack of clear Exclusive Economic Zones. Therefore, it is evident that the differences of the definitions of ICZM and MSP have led to different interpretations of their implementation and incorporation in national policies and legislation systems. This heterogeneity of ICZM implementation across Europe, even among Member States, creates barriers in using ICZM as tool for enhancing land-sea integration of planning systems (Smith et al, 2011).

ICZM and MSP as complementary tools could serve country specific needs (MSP) as well as more local specificities (ICZM). However, this can only be achieved through successful governance structures that enable the full engagement of relevant coastal and maritime stakeholders (COREPOINT

project, 2008).

A further key aspect is the capacity building required for planning professionals to develop legal, cultural and geographical knowledge of each other's' backgrounds and different interests and targets. Even for cases where there is a clear guidance for integration between coastal management and land use planning, research has revealed an inadequate integration of planning efforts mostly due to different perspectives and technical knowledge as well as significant time and resource constraints (Smith et al, 2011).

Common minimum requirements for maritime spatial plans and integrated coastal management strategies are:

1. Maritime spatial plans and integrated coastal management strategies shall establish operational steps to achieve the objectives as set out in Article 5 of the Directive 2014/89/EU, taking into account all relevant activities and measures applicable to them.
2. In doing so, maritime spatial plans and integrated coastal management strategies shall, at least:
 - (a) be mutually coordinated, provided they are not integrated;
 - (b) ensure effective trans-boundary cooperation between Member States, and between national authorities and stakeholders of the relevant sector policies;
 - (c) identify the trans-boundary effects of maritime spatial plans and integrated coastal management strategies on the marine waters and coastal zones under the sovereignty or jurisdiction of third countries in the same marine region or sub-region and related coastal zones and deal with them in cooperation with the competent authorities of these countries in accordance with Articles 12 and 13;
3. Maritime spatial plans and integrated coastal management strategies shall be reviewed in a coordinated way at least every 6 years.

The connection between ICZM and MSP appears to be particularly important in a semi-enclosed basin such as the Adriatic-Ionian Sea, where there is a direct and strong connection between on-shore and marine-based activities and where on-shore activities greatly influence marine environment and ecosystems.

Some examples of potential conflicts can be found, according to ADRIPLAN results, between traditional uses (such as shipping, oil exploration and fishing) and other activities (such as tourism/recreational uses, aquaculture and, in particular, offshore renewable energy) as well as coastal and marine environment protection (including marine protected areas, in addition to the already existing marine and coastal Natura 2000 sites).

ADRIPLAN has been in line with the Barcelona Convention, its Protocol on Integrated Coastal Zone Management and its objectives including the sustainable management and use of coastal zones, ecosystem conservation, reduction of the effects of natural hazards and in particular climate change and coordination and coherence among all authorities exercising their powers in the coastal and maritime zone. Moreover, ADRIPLAN has supported Article 17 of the Protocol for the promotion of a common regional framework which will integrate the application in the coastal zones of individual thematic concepts and approaches such as the ecosystem approach, spatial planning of land and marine areas, economic development, biodiversity, climate change etc.

C.4 Identify and specifically address transboundary MSP issues

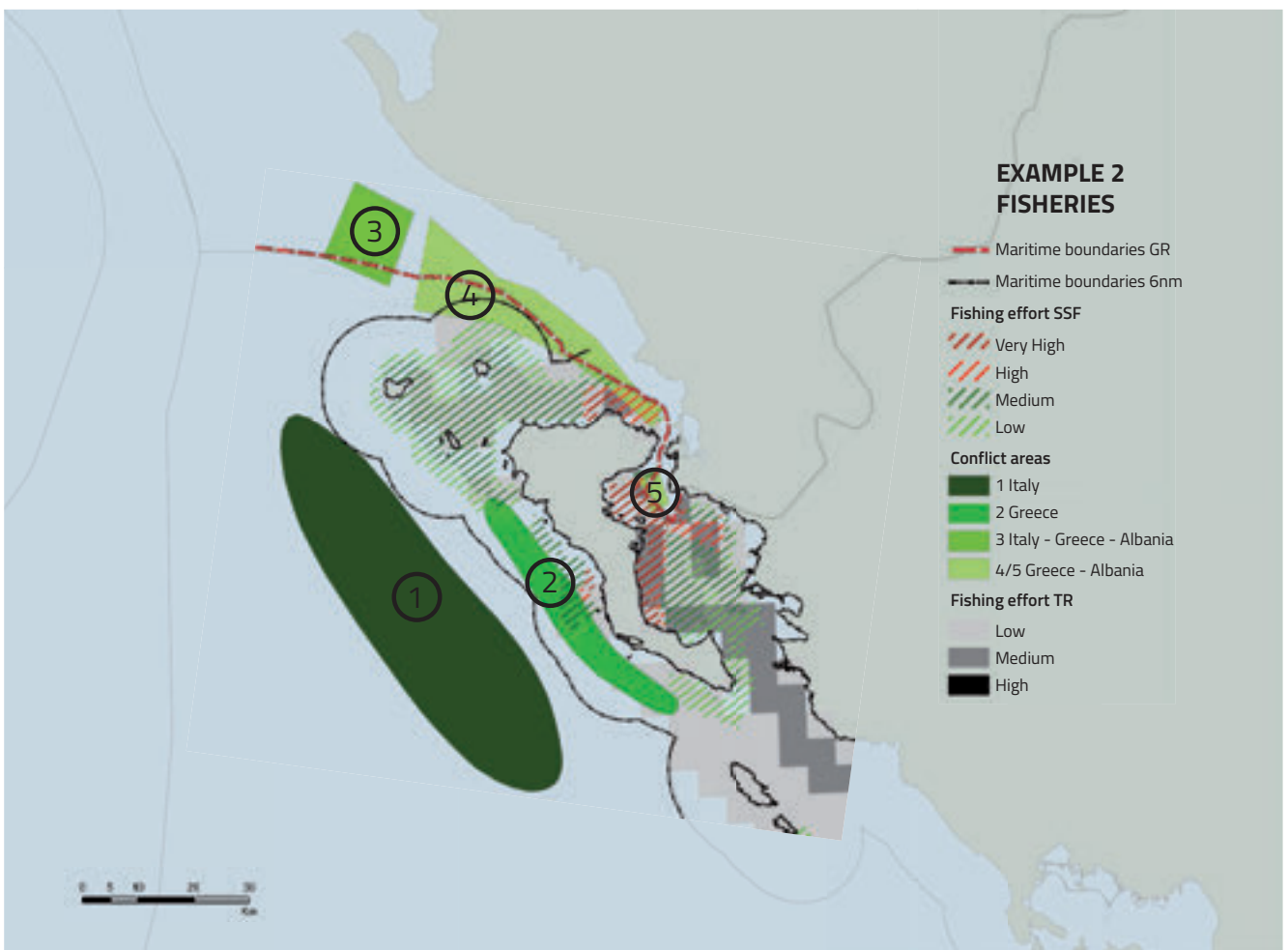
MSP can be, and usually is, a mixture of transboundary and local issues. From the assessment and analysis phase one should have understood how much and where problems to be tackled have a transboundary nature or component.

Besides an overall evaluation and specification of the transboundary MSP context and of the sectors having in their nature mostly a transboundary dimension (maritime traffic, coordination between fishing fleets (see example in Figure 29), oil and gas search & exploitation, aquaculture between Greece and Albania, energy cables connecting western and eastern border of the basin), ADRIPLAN identified and qualified within the AIR seven areas where transboundary aspects are particularly relevant (see chapter 4).

Building on existing mechanisms for cooperation at transboundary level should be perceived in the AIR. In fact, transboundary actions in the AIR can be facilitated by the EUSAIR process and by the existing International Commissions, Organisations and Fora (e.g. The Trilateral Commission for the protection of the Adriatic, the Adriatic-Ionian Euroregion (AIE), the Adriatic Ionian Initiative (AII), MEDPAN, GFCM, UNEP/MAP).

Whatever the responsibility distribution between national Ministries will be for the implementation of MSP Directive, local Administrations, Regions in particular, should be fully and actively involved in the MSP process, for land planning (ICM) connections, data collection and stakeholders mobilisation.

29. Example of need for coordinated fisheries. The map indicates areas where the Greek fishing fleet operates within the Greek territorial waters (grey-gradient for trawlers and lined areas for small-scale fisheries). Five areas (in green), indicated by Greek stakeholders of the fishery sector as areas where vessels of the three neighboring countries compete for shared resources, are outlined.



During the planning phase, scenarios and proposals should be elaborated, taking into account the specific problems faced, the socio-economic framework and national interests to be reconciled in common interests, the legislative and governance framework, the stakeholders view. While such scenarios are agreed, they could be then developed and accomplished through a single initiative or a combination of harmonised initiatives, at international, national and regional level. Within a recognised and well-defined transboundary scenario, also local/ regional plans and actions can become more effective and concrete. While solving problems among uses at sea and safeguarding marine ecosystems, MSP can be a vehicle to promote transnational cooperation.

D. Evaluation, monitoring and adaptive planning and management phase

D.1 Design an evaluation process and define a pool of representative criteria and indicators

MSP is a continuing adaptive process that should include performance monitoring and evaluation as essential elements of the overall management

ADRIPLAN defined a proposal of criteria and indicators to be used for monitoring MSP implementation. The criteria are: effectiveness (in terms of process and objectives); efficiency (adequacy of the human, financial, technical, institutional resources); inclusiveness (involvement of relevant stakeholders); transparency (accountability and dissemination of each phase all the stakeholders involved), while the proposed indicators will refer to three types (Gissi, E., Musco, F., 2015. ADRIPLAN Report: AIP-3.1-1.0 – Report on methodology for MSP):

- *State indicators: connected to the state of system, they assess general state conditions and trends;*
- *Process indicators: they assess how well each phase of the process is run, evaluating its capacity to achieve the operational objectives set for each phase;*
- *Performance indicators: they measure how well a project/action/measure is accomplishing their intended result, by comparing to the results obtained in the previous situation (Ehler, 2014).*

These types of indicators cover also social, economic, environmental and governance aspects, incorporating, thus, an integrated and sustainable approach during the evaluation process, ranging from quantitative to qualitative indicators. The proposed indicators are organised according to six main sets (ADRIPLAN Report AIP-1.4.1-1.0 – Monitoring & Evaluation Process: Review of Assessment Practice and Needs (Papatheochari & Coccossis, 2014). These are:

- **Integration** referring to the thematic (social, economic, environmental) and geographic (spatial coverage, land and sea interface) integration of the MSP implementation;
- **Setting of objectives** by re-confirming that implementation objectives are well specified and updated;
- **Governance** referring to transboundary issues, governance structures for enhancing coordinated actions among the countries of the macro-region, engaging relevant stakeholders, ensuring dissemination and awareness raising;
- **Setting of actions** relating to the achievement of the proposed implementation actions and the mechanisms put in place to ensure their implementation, as well as their estimated short-term and long-term impacts.
- **Adaptation** referring to the foreseen monitoring and evaluation processes set during the implementation procedure, including the review of the proposed time frame, alternative scenarios, actions and evaluation team.
- **Data** relating to the overall data management and availability, including quality, timeliness and accessibility.

process (Ehler, 2014). The evaluation should start actually from the evaluation of the plan-making process and doing so should bring benefits to the improvement of the plan and to other planning initiatives.

The evaluation of plan implementation should be based on standard schemes but should be also customised on specific characteristics of the study area and of key planning measures. It should aim at monitoring main performance indicators and expected barriers and bottlenecks. Criteria and indicators should cover environmental, socio-economic and institutional aspects. Transboundary aspects deserve specific monitoring activities and indicators.

The monitoring implementation plan should be strongly linked and fully coherent with the monitoring plan required by the Strategic Environmental Assessment to be carried out on the proposed plans. The choice on who should manage the planning evaluation process may be a critical one, in order to guarantee an effective monitoring and, even more important, a direct link towards adaptive management. Adequate financial resources should be devoted to carry out such monitoring activities, which can result in significant added value in addressing the use of resources and the choices on best governance schemes.

D.2 Communicate monitoring results and valorize best practices and success case studies

Transparency on the implementation of MSP, including all the preparatory phases, is mandatory for an efficient process and for building trust among administrations and stakeholders. This is in line also with the rationale of “art. 9 - Public participation” of the MSP Directive. Stakeholder involvement should also be put in place throughout the whole monitoring and evaluation process in order to ensure accountability, credibility and transparency of the performance evaluation results. Stakeholders could act as an essential support providing conflict solution alternatives when setting an evaluation procedure, selecting and guiding the evaluating team, selecting the system of the evaluation indicators; review the evaluation results and more importantly disseminating the evaluation process and results. In particular, all those that participated in developing the planning process and that have competences on its implementation should be updated on what’s going on and if and where there are needs for adaptation and improvements. Within this communication process, a specific and not secondary attention should be given to presenting ongoing best practices and success case studies. Still, there is the need to show concrete added value that can be obtained through proper implementation of transboundary MSP.

A number of important ongoing best practices and experiences on MSP/ICM can be identified in the AIR area, to be linked and capitalized within the future MSP process. Those practices regard mainly:

- *ICZM and sectoral planning, mainly at regional scale, with their related SEAs;*
- *Activities related to EU policy implementation (WFD, MSFD, H&B Directives, Floods Directive, etc.);*
- *Local or medium-scale projects and plan, with their related Environmental Impact Assessments and Strategic Environmental Assessments;*
- *Pilot projects within national and transnational cooperation projects (e.g. SHAPE);*
- *Structured and permanent/semi-permanent forum and networks, with particular reference to the Technical Groups addressing Pillars actions under EUSAIR.*

Underway activities to implement MSFD (GES and Target improvement, Monitoring programmes, Programme of Measures) at national level, with coordination within the Mediterranean region and parallel activities carried out under the Barcelona Convention, are strongly and bidirectionally connected with MSP.

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