Work package 5: Operationalisation and participation in test sites

D5.4: Final recommendations, transferability and scale-up of effective biodiversity mainstreaming in MSP

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ABSTRACT	Deliverable 5.4 presents the final recommendations regarding the transferability and scaling up of effective biodiversity mainstreaming in MPS. It provides the findings from the cross-test site analysis and advises on the transferability of results, as well as the potentials and barriers associated with scaling them up. The recommendations are tailored for each European Sea Basin in the MSP4BIO (North Sea, Baltic Sea, Northeast Atlantic Ocean, Mediterranean Sea and Black Sea), emphasizing the key challenges, opportunities, and necessary enabling conditions for successful implementation, thereby laying the groundwork for broader application across Europe and beyond. The report encompasses three key components, including: a) the ways biodiversity can be considered in MSP depending on the local conditions, b) key pitfalls and enablers for ecosystem-based management in MSP of key economic sectors depending on the sea basin relevance, and c) key policy coherence considerations feeding into regional strategies.
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2.0	15/12/2025	A summary table on the challenges and enablers for upscaling the results was added to reduce the text and avoid repeating of the information in D5.3.

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Acronyms

ABNJ	Areas Beyond National Jurisdiction
AMSs	Aquaculture Management Areas
AZAs	Allocated Zones for Aquaculture
BAT	Best Available Techniques
BEP	Best Environmental Practices
BSAP	Baltic Sea Action Plan
BSEC	Black Sea Economic Cooperation
BSTC	Baltic Sea Tourism Centre
CC	Climate Change
CEA	Cumulative Effect Assessment
CEAF	Common Environmental Assessment Framework
CFP	Common Fisheries Policy
CoPs	Communities of Practice
DEP	Dissemination and Exploitation Plan
DG MARE	Directorate-General for Maritime Affairs and Fisheries
DSTs	Decision Support Tools
EAA	Ecosystem Approach to Aquaculture
EEA	European Environmental Agency
EBA	Ecosystem-Based Approach
EBA	Ecosystem-Based adaptation
EBM	Ecosystem-Based Management
EBSAS	Ecologically or Biologically Significant Areas
EcoQOs	Ecological Quality Objectives
EEZ	Exclusive Economic Zones
EGD	European Green Deal
EIA	Environmental Impact Assessments
EMFAF	European Maritime, Fisheries and Aquaculture Fund
EMODnet	European Marine Observation and Data Network
EOP	European Ocean Pact
EU	European Union
ESE	Ecological and Socio-Economic
EUBS	European Union Biodiversity Strategy
EUSAIR	EU Strategy for the Adriatic and Ionian Region
EUSBSR	EU Strategy for the Baltic Sea Region
FAO	Food and Agriculture Organization
FLAGs	Fisheries Local Action Groups
FPS	Federal Public Health Service
FRA	Fishing Restricted Areas
GES	Good Environmental Status

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GFCM	General Fisheries Commission for the Mediterranean
GNCB	Greater North Sea Basin Initiative
HELCOM	Baltic Marine Environment Protection Commission
HOLAS	Holistic Assessment of Ecosystem Health in the Baltic Sea
ICES	International Council for the Exploration of the Sea
ICZM	Integrated Coastal Zone Management
IHO	International Hydrographic Organization
IMO	International Maritime Organization
IMTA	Integrated Multi-Trophic Aquaculture
IUCN	International Union for Conservation of Nature
KTP	Knowledge Transfer Plan
LSI	Land-Sea Interactions
MOEW	Ministry of Environment and Water (Bulgaria)
MPAs	Marine Protected Areas
MRDPW	Ministry of Regional Development and Public Works (Bulgaria)
MS	Member States
MSFD	Marine Strategy Framework Directive
MSFD PoM	Marine Strategy Framework Directive Programs of Measures
MSPD	Maritime Spatial Planning Directive
NEAFC	North-East Atlantic Fisheries Commission
NGOS	Non-governmental organizations
OECM	Other Effective Area-based Conservation Measure
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
OWF	Offshore Wind Farms
PLC	Pollution Load Compilations
PORN	Natural Resources Management Plan
PSSAS	Particularly Sensitive Sea Areas
PW4Blue	PlanWise4Blue
RAS	Recirculating Aquaculture Systems
RFMO	Regional Fisheries Management Organizations
SAC	Special Area's of Conservation
SDGs	Sustainable Development Goals
SEA	Strategic Environmental Assessment
SPIA	Spatial Pressure and Impact Assessment
SWD	Staff Working Document
UNDP	United Nations Development Program
VASAB	Vision and Strategies Around the Baltic Sea
VME	Vulnerable Marine Ecosystems
WFD	Water Framework Directive
WWF	World Wild Fund for Nature

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Executive Summary

As the European Member States (MS) moved forward with the Maritime Spatial Planning (MSP), one challenge still remains consistent: how to effectively protect and restore biodiversity while managing the many demands on our marine spaces. MSP4BIO project is tackling this head-on with innovative solutions that bridge the gap between theory and practice — ensuring that biodiversity becomes a core element of the MSP across Europe.

Building on the valuable results from the MSP4BIO tools applications and developed site-specific planning solutions (D5.3, Stancheva *et al.,* 2025), it is important to evaluate how well these findings can be transferred and adapted to other coastal and marine areas, both across Europe and worldwide, to set the stage for scaling them up effectively.

The Deliverable 5.4 (D5.4) analyses the transferability and replicability potential of the results of the MSP4BIO applied tools/methods that supported the development of test site solutions, and addresses the barriers and challenges encountered. This analysis supports cross-site evaluation and provides final recommendations for scaling up the project results across the five sea basins involved: the North Sea, the Baltic Sea, the Atlantic Ocean, the Mediterranean, and the Black Sea.

While each sea basin has its unique needs and potentials for results transferability, there are several common recommendations for scaling up the results. These focus on:

- Effectively communicating test site outcomes to support regional frameworks by aligning the proposed integration of MSP and Marine Protected Areas (MPAs) management with existing regional strategies;

- Promoting science-based, stakeholder-driven planning by boosting capacity-building and fostering stakeholder dialogue (e.g., using participatory mapping and trade-offs assessments) to efficiently integrate socio-economic and cultural dimensions into MSP;

- Leveraging science-driven MSP to support regional efforts on biodiversity protection by embracing a more strategic /regional and proactive approach;

- Enhancing governance and policy coherence at regional level and advancing sea basin-wide cooperation through creating robust regional governance mechanisms for real-time collaboration, data sharing, and joint decision-making, including common guidelines for biodiversity targets and aligned spatial planning strategies;

- Sharing, promoting, and building on results while leveraging established MSP4BIO Communities of Practices (CoPs) to encourage peer learning, exchange national experiences, and co-create solutions. These networks can act as a lasting platform for updates, case studies, and new applications of MSP4BIO methods.

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1 Introduction

Transferability of project results refers to how well a strategy/solution or practice/outcome can be adapted to different spatial contexts or needs of various regions. Some strategies or practices from one marine area can be transferred to another, if key considerations are addressed. Transferability of project outcomes is often demonstrated by providing stakeholders, decision- and policymakers with evidence and successful examples that the research results can be scaled up and applicable across various contexts, situations, local needs and time periods with different alternatives for decision-making.

Generally, transferability of results encompasses the dissemination of knowledge, best practices and lessons learned acquired in the project and can be defined as the process through which original and applied knowledge/experience generated in a specific area, potentially becoming accessible to external stakeholders. Notably, in recent years, the spread of knowledge has emerged as a crucial factor in driving Blue Economy sustainability. It has also been recently included as a fundamental component of the European Ocean Pact (EOP)[1], aimed at strengthening ocean knowledge and promoting improved data collection, sharing, and coordination among European Union (EU) Member States (MS) to facilitate informed policymaking and foster industry innovation.

The key elements supporting the transferability process in MSP4BIO are:

- utilizing the project results to ensure that the experience and best practices are applied sustainably in a long-term,
- enhancing the overall impact of the project, and
- increasing global awareness of issues similar to those tackled by the MSP4BIO project, especially concerning the improved alignment of MSP and MPAs management.

Additionally, scaling up of project results refers to the process of expanding or extending the main outcomes to achieve broader, more widespread impact. This can involve increasing the scope, resources, or outreach to ensure the positive outcomes last in a long-term and have a broader impact. Scaling up is essential for projects, like MSP4BIO that have proven successful on different scales and need to be replicated or expanded to achieve their full potential and maximize impact.

In the light of above, MSP4BIO improves the understanding of the key elements that lead to biodiversity loss across the six test sites within the five EU sea basins (the North Sea/Belgian part, the Baltic Sea (entire sea basin), the Northeast Atlantic Ocean (Azores, Graciosa Island and Gulf of Cadiz), the North Western (NW) Mediterranean Sea (Pelagos Sanctuary and Gulf of Lion) and the Western Black Sea (cross-border area of Romania and Bulgaria). The application results from the MSP4BIO ESE (Ecological and Socio-Economic) Framework operationalization in the test sites and the developed specific planning solutions for mainstreaming biodiversity in MSP, together with identified

[1]The European Ocean Pact is a comprehensive strategy to better protect the ocean, promote a thriving blue economy and support the well-being of people living in coastal areas. (COM (2025) 281 final Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Ocean Pact, Brussels, 5.6.2025, https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=comnat:COM_2025_0281_FIN

challenges/barriers and opportunities set up the basis for the elaboration of the D5.4 on final recommendations for transferability and scalability of results, see D5.3 (Stancheva *et al.*, 2025).

The transferability analysis in the D5.4 provides tailored sea basin wide recommendations that can advise further MSP planners and MPA managers across the EU and beyond. Impacts are maximised through direct involvement of planners and managers, also with the established CoPs in the test sites in co-creation, demo training, and collaboration with the European and international initiatives. A set of key dissemination elements improved understanding and presentations at major events and encouraged the uptake. The D5.4 report assesses the best way of scaling up these interactions and developed solutions to achieve results at meaningful scales through replication, networking, or mainstreaming onto other EU and global platforms.

Context of the deliverable:

To reach these objectives, the report of D5.4 outlines the methodology for the analysis of transferability of results from the ESE application and its operationalization in the six MSP4BIO test sites. It identifies the commonalities and differences related to this transferability and scalability recognized in the test sites, as well as the challenges and barriers encountered for the successful implementation of the planning solutions. Additionally, the D5.4 highlights key pitfalls and enablers for the Ecosystem-Based Management (EBM) approach within the context of MSP and a nature-inclusive Blue Economy, focusing on the five key sectors relevant to MSP4BIO and pre-selected at the test sites: Fisheries, Aquaculture, Tourism, Extraction of marine non-living resources and Renewables. In addition, D5.4 focuses on policy coherence considerations for scaling up results, which are crucial for advancing regional sea-basin strategies.

2 Objectives and methodology

2.1 Objectives

Deliverable 5.4 presents the findings from the analysis conducted across the six MSP4BIO test sites and advises on the transferability of the results and potentials and barriers for their upscaling beyond the test sites. The final recommendations at regional level are outlined for each of the five European Sea Basins (the North Sea, the Baltic Sea, the Atlantic Ocean, the Mediterranean Sea and the Black Sea) highlighting key challenges, opportunities, and enabling conditions necessary for success, to provide the basis for scaling up across Europe and beyond. The key components of the report include:

a) the ways biodiversity can be considered in MSP depending on the local conditions,

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b) key pitfalls and enablers for Ecosystem-Based Management (EBM) of key economic sectors depending on the sea basin relevance, and

c) key policy coherence considerations for results upscaling feeding into regional strategies.

The aim of the D5.4 report is to underline key similarities and differences experienced by the test sites in exploring/testing the MSP4BIO integrated Ecological and Socio-Economic (ESE) Framework and its modules (D4.5): ESE1 Ecological Toolkit, ESE2 Socio-Economic and Governance criteria, and ESE3 Trade-offs, all supported by Policy Solutions. It also seeks to highlight the results from the application of the ESE Decision Support Tools (DSTs) across different contexts and scales of the test sites, while emphasizing the valuable insights gained from the MSP4BIO, which could be adapted and applied to future test sites for improved integration of MPAs into MSP in Europe and globally.

Dissemination of project knowledge and results serves as a way to highlight transferability, increase the project's visibility, strengthen networks among current and potential stakeholders, gain formal recognition for the project's outcomes, and encourage ongoing feedback from the stakeholders. When specific criteria are met, dissemination can serve as a cornerstone for the sustainability and transferability of the project results, although other factors may also influence this process. Consequently, dissemination and communication have started immediately and have continued throughout the project's lifespan. The MSP4BIO Dissemination and Exploitation Plan (DEP) (D7.2) has been provided since the project's inception in Month 6, outlining the resources that have been made available and the activities that are established as the project generates and collects results. Key activities included the organisation of workshops, training sessions, webinars, think tank science-policy dialogues, and focus group meetings, aimed at disseminating knowledge and ensuring the integration of project solutions into the work of key actors. To complement the dissemination plan, the MSP4BIO D7.3 Knowledge Transfer Plan (KTP) proposed specific strategies to ensure knowledge not only reaches its intended audience, but is also up taken, applied, and generates high impact.

An effective roll-out communication and knowledge transfer campaign has been sustained throughout the MSP4BIO project, while dissemination and exploitation of project results have been facilitated via the interactive online tools, trainings demonstration sessions, and the webinar on test-site specific solutions conducted on 09 April 2025 as a virtual event. The webinar presentations effectively showcased the innovative test site solutions that were developed, emphasizing the insights gained and the benefits achieved. Additionally, they addressed the ongoing challenges and outlined the next steps required for the effective implementation of these solutions.

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2.2 Methodology

The cross-site analysis conducted in Task 5.4 involves evaluating the results from the test sites specific solutions, see D5.3 (Stancheva *et al.,* 2025) to identify both similarities and differences, as well as common challenges and enablers related to the implementation of solutions.

Furthermore, by exploring challenges and enabling factors for solutions implementation, partners were able to pinpoint potential obstacles and barriers, as well as opportunities for transferring and scaling up the results beyond and across the various sites. Additionally, preliminary recommendations are formulated concerning the regional transferability of the results, aimed at informing and supporting the strategies and initiatives for the regional sea basins.

In accordance with the integrated ESE Framework in the MSP4BIO, key factors considered for transferability and scale-up of effective biodiversity mainstreaming in MSP include:

a) Contextual similarities and differences

- **Ecological context**: spatial domains and marine ecosystems differ across the test sites, thus biodiversity priorities and criteria in one site may not apply to another. While the core principles of biodiversity mainstreaming remain similar, specific conservation strategies and ecological criteria need to be tailored to local ecosystems.
- **Socio-economic context**: the role of marine resources and MPAs for local livelihoods, tourism, fisheries, or other sectors will influence how biodiversity is mainstreamed. What works in one test site might not be feasible in another without careful adjustment.
- **Governance and legal framework**: existing laws, policies, and governance frameworks vary between test sites and sea basin regions. Effective integration of biodiversity into MSP frequently relies on the legal acknowledgment and political commitment of the necessity for integrating biodiversity conservation in MSP, which may be lacking or inadequately developed in various other areas.

b) Adaptability of integrated ESE tools, methods and participatory approach

- **ESE DSTs**: the use of innovative spatial tools, technologies and participatory mapping can be transferred to other coastal and marine areas across EU and beyond for spatially identifying biodiversity hotspots, trade-offs, mapping human activities, and assessing impacts on ecosystems in the context of MSP.
- **Effective stakeholder engagement**: the iterative process of engaging and co-developing ESE with the established CoPs at each test site, while involving local communities, MSP and MPA competent authorities, NGOs, and various sectors in the planning and decision-making processes, is highly transferable. However, the methods of engagement and participatory strategy as developed in D5.2 (Matchak

et al., 2024)[2] have needed to be adjusted to better align with local cultural contexts and social structures.

c) Demonstrated success in test sites

- **Operationalization and validation of ESE**: if one test site has successfully enhanced and mainstreamed biodiversity into its MSP framework (for example, by elaborated solutions for MPAs extension or newly designated areas, sustainable fisheries management, or restoration measures), this success can be used as a good replicable model or pilot for other regions.
- **Uptake of results**: effectively integrating biodiversity into MSP plans by engaging with CoPs, where spatial planning decisions can directly reflect the suggested solutions, can serve as an exemplary model for other regions across Europe and globally.

It is crucial to articulate how the outcomes of the project are anticipated to be utilized, highlighting the primary benefits of the solutions that have been created. The results have been manifested directly, such as through the MSP4BIO developments, especially the ESE Framework supported by the DSTs, demonstrating the application and testing procedures, models, improved knowledge, and MSP and MPA management processes.

The assessment of transferability of the results from the ESE Framework operationalization is based on analysing **the Opportunities/Enablers, and Challenges/Barriers from the test sites to set up the basis for upscaling of results**. We considered potential transferability of the results at the level of test sites, taking into account the established CoPs, extending beyond the test sites to a regional level across the EU, and also on a global scale (Table 1). Most of the MSP4BIO spatial and strategic solutions are also related with the cross-border and transboundary cooperation, supported by the EU maritime and biodiversity policies, as well as by the existing sea basin and international initiatives. At the national level, solutions could be considered and taken on board by the MSP and MPAs competent authorities.

Table 1. Scale of uptake and capitalization of results

Type/level	Direct Uptake	Indirect uptake
Local	CoPs at each test sites (made up of MSP and MPAs practitioners and other relevant stakeholders)	Local NGOs, sectoral organizations/local authorities, associations, students, citizens, etc.
National/cross-border	MSP and MPA Competent Authorities (ministries and their executive agencies)	Environmental organisations, research institutions/universities,

[2] Test sites methodology including the participation strategy (available online by the end of the project)

		planners, business and blue economy sectors
Regional	Sea basin conventions and commissions, regional inter-ministerial, economic and strategic organisations	Non-EU basin countries, regional NGOs, regional assistance mechanisms, regional CoPs biodiversity conservation and MSP sea basin projects
European/international	European Commission, DG Research and Innovation, DG MARE, Mission Ocean and Waters, other policy makers, IUCN Global Protected Areas Programme and UNDP	EU MSP Platform, Blue Forum, MSP Global, European Ocean Pact, Sustainable Development Goals (SDGs), Blue BioMatch, MPA Community Network

MSP4BIO key users and beneficiaries

The target audience of MSP4BIO includes MSP planners, MPA managers, environmental authorities, and a variety of stakeholders and decision-makers. These potential users range from regulatory bodies to representatives from the blue economy, environmental organizations, and professionals/practioners involved in MSP and MPAs (Fig. 1).

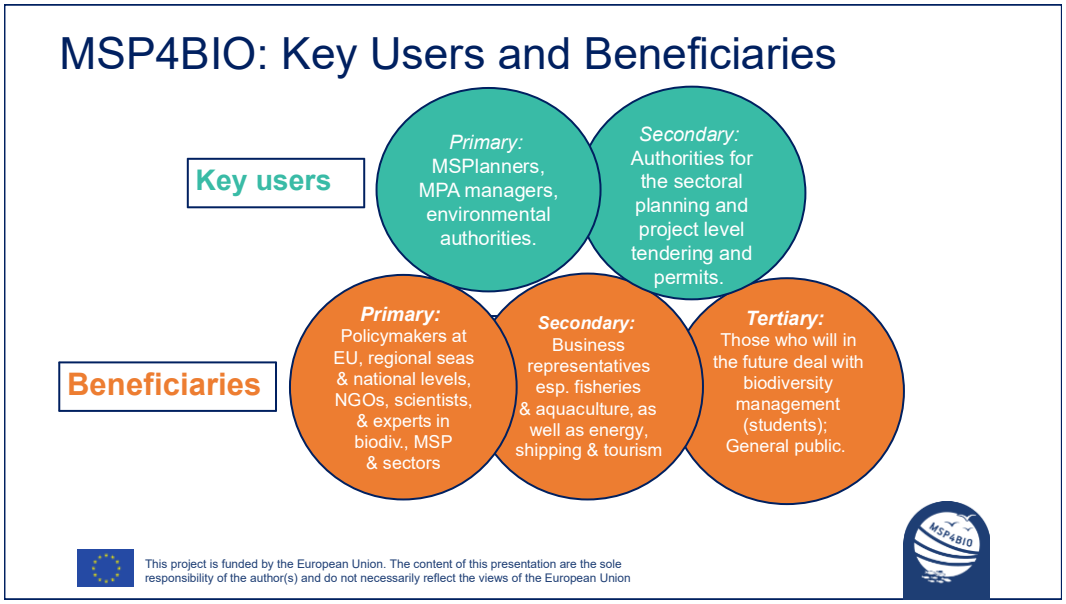

Figure 1 Main target groups of MSP4BIO.

The core user groups are the MSP4BIO CoPs established in each of the six test sites early in the project. In total over 50 stakeholders have been identified and engaged in the CoPs, selected based on their direct involvement the test site planning and biodiversity management process and the relevance of MSP4BIO results to their work. CoPs are made up of MSP and MPAs practitioners and in general way, of stakeholders involved in maritime uses management (5-10 members each). The CoP provides a collaborative platform for members to:

- Share interests, best practices, and experiences;

- Facilitate mutual learning and networking;
- Coordinate efforts in MSP and MPAs;
- Enhance collaboration among institutions and maritime activities;
- Exchange information and expertise;
- Foster innovation and develop new ideas;
- Support professional development and creative problem-solving skills.

The established CoPs within MSP4BIO have played a crucial role in promoting the adoption and utilization of project outcomes from the outset, thereby enhancing national initiatives through improved science-based and data-driven MSP. This effort aimed inter alia to meet the EU biodiversity goals, which include protecting 30% of marine areas and ensuring that 10% of these areas are under strict protection.

Multipliers

Multipliers are groups and networks that have a strong presence / outreach in one of the key stakeholder categories for MSP4BIO. While the relevant stakeholder groups are listed above, it was particularly important to connect with larger networks (e.g. the MPA Community Network) associations, and other multipliers that can facilitate the broad and efficient dissemination of the project outputs. In total 25 multipliers have been identified covering the following fields:

• MSP planners
• Marine protection / MPA managers
• Sectoral authorities (offshore wind, fisheries, aquaculture, tourism, environment)
• Ocean industries covered in the project (offshore wind, fisheries, aquaculture, tourism)
• Marine policymakers
• Researchers working in the above listed fields
• Marine data managers
• General public

The identification of multipliers has been an ongoing process and is continued as the project progresses. The capacity building and participatory approaches that actively involved the MSP4BIO CoPs, which also serve as multipliers, have fostered connections with additional stakeholders and institutions at both national and regional levels, extending beyond the project's initial scope. To promote broader adoption of the solutions developed through the MSP4BIO project, a comprehensive knowledge transfer strategy and outreach campaign have been implemented. Key participants have been provided with the necessary skills, knowledge, and insights regarding the project outcomes to drive meaningful change. The goal is to facilitate and enhance the uptake of project results, which required the commitment of planners, MPA managers, and other relevant stakeholders engaged in the MSP4BIO CoPs. These local CoPs are meant to support improved local collaboration and have a lasting impact on future rounds of planning, allowing among others for better integration of biodiversity considerations in MSP.

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3 Cross-test site analysis to assess transferability of results

The subsequent section outline the key opportunities and obstacles related to transferability of results of applying the ESE tools and proposed specific solutions of the test sites, see D5.3 (Stancheva *et al*., 2025), (the **Opportunities/Enablers**, and **Challenges/Barriers** from the test sites to set up the basis for upscaling of results).

The six MSP4BIO test sites represent various geographical scales and spatial dimensions: from coastal, onshore, offshore to deep marine ecosystems, see D5.1 (Withouck *et al*., 2023). They also reflect a wide range of MSP planning phases and MPAs management, and different ecological and socio-economic challenges, thus providing opportunities to develop and test diverse solutions that are adaptable and scalable across Europe and beyond. While the theory behind integrating MPAs into MSP is well-established, and ecological research continues to grow, practical implementation remains a challenge. Planners and decision-makers need reliable, validated strategies to guide their actions. As pointed out above, MSP4BIO addresses this challenge by creating innovative, site-specific planning solutions. These include identifying and prioritizing areas for new MPAs, expanding existing ones, supporting restoration efforts, and implementing sector-specific management measures, among others:

- The Baltic Sea test site conducted a detailed analysis of spatial pressures and impacts on MPAS using the HELCOM SPIA (Spatial Pressure Impact Assessment) tool, to consider environmental pressures and human impacts and identify the most affected ecosystems.

- The main objective of the Belgium test site (North Sea) was to implement the Area-Based Conservation (ABC) planner tool for prioritizing and optimizing areas for strict conservation, considering important species, as well as the distribution and impacts of human activities and pressures.

- The Graciosa Island test site (Azores) solution emphasized a comprehensive approach that balances economic environmental objectives to ecosystem management using trade-offs with the aim to expand the existing MPA while safeguarding biodiversity and minimizing conflicts between human activities such as fishing and tourism.

- The Cadiz Bay test site underscores the significance of integrating MSP and MPAs to tackle socio-ecosystem challenges. Given the characteristics of the region, the solution focused on alignment existing tools and addressing policy barriers such as fragmented governance and inadequate funding.

- The objectives of the NWMed test site were to inform MPA and MSP processes on the need for protection of two primary environmental features: cetaceans and deep vulnerable marine ecosystems, and addressing pressures on these species mainly from maritime traffic and bottom fishing.

- The Western Black Sea test site (Bulgaria and Romania) developed solutions to identify potential conflicts from the proposal/scenario to enlarge existing MPAs. These solutions integrated trade-off analysis in MSP utilizing SeaSketch Participatory Mapping and

cumulative impact assessment using the PlanWise4Blue DST, with the aim of preserving valuable mobile species (marine mammals). The added value of this site lies in shaping MSP and MPAs processes coherent at both national and cross-border contexts.

The opportunities / enablers and challenges/barriers for results transferability and scaling up, identified from the test sites in the D5.3 (Stancheva *et al.,* 2025) are summarized in Table 2 below.

4 The ways biodiversity can be considered in MSP depending on the local conditions – test site/national level

Maritime Spatial Planning is designed to follow an EBA, ensuring marine ecosystem health and sustainability. In practice, however, MSP often remains sector-driven, with still a weak operational integration of MPAs and Area-Based Conservation Measures (OECMs). With the adoption of the EU MS MSP plans it is anticipated that marine conservation, particularly the establishment of MPAs, would be better integrated into MSP. However, in reality, MSP and the designation of MPAs are often taking place in parallel to each other, with relatively little integration between them. This is partly due to the longer history of marine conservation and the established institutional frameworks that cannot be easily incorporated into MSP processes (Trouillet and Jay, 2021). Challenges also include unclear biodiversity criteria, insufficient policy coherence, and limited understanding of human activities and ecosystem interactions.

To address these gaps, MSP4BIO collaboratively with the CoPs developed and tested the ESE management Framework (D4.5[3]). The framework enhances the integration of systemic biodiversity considerations within MSP and sectoral planning processes. The ESE Framework is designed as a flexible, integrated EBA that meets the demand for management strategies capable of adapting to the rapid changes occurring in coastal, offshore, and deep-sea marine ecosystems, as well as the interconnections among them. The novelty of the undertaking is also in the fact that the ESE Framework's development incorporates and builds upon the implementation of relevant policy criteria and objectives, including the Marine Strategy Framework Directive (MSFD), Water Framework Directive (WFD), Maritime Spatial Planning Directive (MSPD), Common Fisheries Policy (CFP), the European Union Biodiversity Strategy (EUBS) 2030, and the European Green Deal (EGD), thereby facilitating coherent policy implementation in alignment with the European Ocean Pact.

[3]D4.5 will be available end of the project

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Table 2. Opportunities and challenges for results transferability

Opportunities and challenges for results transferability	Baltic Sea	Belgian part of the North Sea	Atlantic (Azores)	Atlantic (Cadiz Bay)	Northwest Mediterranean	Western Black Sea (Bulgarian part)	Western Black Sea (Romanian part)
1.Opportunities /Enablers	- Methodological adaptability of sensitivity matrix to other regions in defining pressure-ecosystem relationships. - Cross-regional learning: the solution fosters knowledge-sharing and capacity-building. - Enabling other sea basins to replicate the process by tailoring tools to fit ecological, social, and economic contexts. - Re-calibration of SPIA tool with data from other regions, enabling scalability and cross-basin comparisons.	- Nature restoration and biodiversity conservation: allocating areas for strict protection will benefit and restore biodiversity. - Research spill-over effect of the new strict MPAs and link it to the possible economic benefits. - Evolving European legal framework for Natura 2000 to become more flexible and adaptive: for conservation of pelagic habitats and studying climate change effects.	- Structured approach of planning solution by integrating ecological and socio-economic dimensions of ESE Framework. - Revision of coastal MPAs: the experience can and should be replicated in other 8 islands of the Azores. - Methodological adaptability: participatory mapping, stakeholder engagement, and trade-off method through CoP can be tailored to diverse coastal and marine environments, promoting collaborative decision-making.	- The MSP4BIO project provides a transferable framework that other regions can use to develop their own draft local solutions. - Project developments including ESE frameworks and policy solutions, offer valuable guidance and tools to support the adaptation and application of these approaches in other contexts.	- Data collection on VME is not strictly confined to the test sites, and could support conservation in a broader area. - Methods to evaluate VME distribution using a modelling approach could be capitalized and applied elsewhere. - Medit database, with VME records, is crucial for scaling the modelling approach to the basin level. - Meeting strong conservation expectations: the concept could be shared and applied in any maritime area.	- Methodological adaptability: participatory mapping, stakeholder process and trade-off method through the CoP, can be adapted to various coastal and marine environments. - PW4B's CEA is a key tool for comprehensive assessment the impacts of human activities on natural values. - SeaSketch tool can be used to incorporate transboundary and cross-border information, and data on sea activities, ecological features and MPAs at the Black Sea regional level.	- The proposed planning solution can be replicate in the process of implementation of MSP in the rest of Black Sea basin particularly in Turkey and Georgia. - Participatory mapping survey can be used at the Black Sea regional level.

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Opportunities and challenges for results transferability	Baltic Sea	Belgian part of the North Sea	Atlantic (Azores)	Atlantic (Cadiz Bay)	Northwest Mediterranean	Western Black Sea (Bulgarian part)	Western Black Sea (Romanian part)
2. Challenges/ Barriers	- Specificity of sensitivity matrix: developing equivalent matrices for other regions requires significant data collection, expert engagement, and workshop facilitation. - Data availability and quality: lack of high-resolution ecological and socio-economic data by other basins to replicate the Baltic-specific models, potentially reducing precision of results.	- Prioritization of economic interests over the achievement of the conservation objectives. - Need for improved data support, integration of social and economic aspects in MPAs and better co-creation in the MSP process. - Transboundary collaboration: each country has its own approach and organization for MSP, with legislative frameworks and scientific priorities often lacking alignment.	- Variations in local governance structures, data availability, skilled human resources, specific ecological conditions, and stakeholder dynamics may affect the results. - Lack of political commitment for integration of MSP and MPA frameworks in diverse contexts, is challenging for effective transferability of Graciosa model to a broader range of sites and globally.	- The proposed solution for Cadiz Bay is site-specific, tailored to its unique socio-ecosystem challenges. - Applying ESE tools may still face obstacles like limited data, ecological variability, and institutional capacities, but the project's resources significantly enhance the potential for broader impact.	- The methodology is highly applicable; the tools employed are site-specific arising from data availability/high resolution required. - Adaptation is possible with sufficient knowledge of another site. - Solutions should be adapted to each local context, and specific environmental regulations.	- Emerging human activities, such as OWF and offshore aquaculture overlapped with MPAs. - Lack of management MPAs plans. - Data gaps and limited high-resolution spatial data for CEA application. - Scarcity of trained human resources within the institutions to use the SeaSketch and CEA tools. - Operational implementation of multi-use and trade-offs in MSP, considering all stakeholder interests is still a challenge.	- Limitations of environmental (spatial distribution of species, high-resolution benthic habitats mapping). socio-economic and pressure data at Black Sea basin level. - Existing data are not harmonized. - Lack of collaboration between MSP and MPA authorities to integrate economic strategies and conservation objectives.

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In contrast to current practices, the ESE approach advised and supported the development of tailored solutions that align with conservation and socio-economic objectives specific to each of the six MSP4BIO test sites (D5.3, Stancheva *et al*., 2025). A significant shortcoming in the integration of MSP and MPA management pertains to social dimensions. It was crucial to assess the potential social impacts of both processes on various stakeholder groups and to understand their perceptions of the management strategies implemented. The resulting ESE Framework not only integrates MPAs and MSP but also incorporates sectoral planning, thereby enhancing the efficiency of both processes.

As mentioned above, MSP4BIO test sites encompass a variety of scales, from local to national, as well as cross-border and sea basin-wide regions. This diversity facilitates significant contributions to the identification and establishment of ecological corridors, MPAs networks, and Ecologically or Biologically Significant Areas (EBSAs), tailored to different geographical and governance contexts.

MSP4BIO has increased the capacities and motivation of those involved in biodiversity planning, facilitating the improved integration of MPAs within the context of MSP and ensuring effective management of these areas. This was achieved through iterative interactions with CoPs that included identifying gaps and local needs, trade-offs and participatory mapping, user-friendly DTSs, such as PW4Blue CEA for cumulative impact assessment and ABC Planner for prioritization and an online visualization ESE platform. Local CoPs have been vital in co-designing and consulting these developments and ensuring the adoption of the results (D5.1, D5.2, D5.3, D5.4 and D5.5[4]).

How the proposed planning solutions for biodiversity mainstreaming in MSP can be integrated across the test sites and how are they supported by the respective governance systems are summarized below in Table 3.

Looking ahead

With the support of MSP4BIO ESE Framework and the cutting-edge DSTs, the next round of national MSP plans will have a higher capacity to incorporate biodiversity conservation objectives into the planning process. The revisions to MSP plans within the EU will be well-equipped to facilitate the attainment of the biodiversity targets established in the EGD, the European Biodiversity Strategy 2030 (EUBS) and the EOP.

The growing adaption and implementation of ecosystem-based MSP as a standard practice, along with improved coordination between MSP and MPA processes, will facilitate more efficient management of maritime sectors. This integration will not only aid in the conservation of biodiversity but also yield economic and societal benefits through the promotion of enhanced and sustainable marine biodiversity.

[4] Deliverable 5.5 on stakeholder engagement will be published at the end of the project

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Table 3. Overview of the ways of integration of MPAs in MSP and supporting governance context

Integration MSP and MPAs/ Governance context	Baltic Sea	Belgian part of the North Sea	Atlantic (Azores)	Atlantic (Cadiz Bay)	Northwest Mediterranean	Western Black Sea (Bulgarian part)	Western Black Sea (Romanian part)
1. Integration of MPAs in MSP	Enhancing cross-sectoral coordination Incorporating cumulative impact assessments into MSP Embedding training and capacity building in MSP and MPA processes Supporting adaptive MPA designation	Integrating MSP with other relevant frameworks, including the MSFD, WFD, Natura 2000, and SEA Directive Using planning solution as validation exercise	Enhancing MPA designation and management BlueAzores project to advance the proposed MPA in Graciosa. Azores MSP has recently been adopted and can integrate new MPAs	Establishing a unified vision for integration MPA designation and management with MSP Addressing LSI to ensure connectivity between terrestrial and marine ecosystems. Engaging stakeholders from various sectors and governance levels	The ongoing MSP process serves as a platform for consultation on strict protection designations for France and MPAs in Italy. Enhancing cooperation by large transboundary MPAs such as Pelagos Sanctuary	Enhancing institutional and cross-sectoral collaboration Applying trade-offs in MSP for MPAs prioritization and designation (participatory mapping) Supporting adaptive MPAs designation and coherence Integrating CEA in MSP Capacity building and training in trade-offs and CEA for MSP and MPA management	Using participatory mapping and CEA both in MPAs designation and management and MSP Assessing how new activities could affect various components of ecosystems in MPAs
2. Governance context	MSP is coordinated regionally by the HELCOM-VASAB MSP Working Group Baltic Sea Action Plan MSFD and WFD implemented at MS level EU Biodiversity Strategy 2030 (implemented by MS, without Baltic Sea regional coordination)	MPAs designation is integrated in MSP Strong governance framework for MSP and MPAs The new MSP is in its final stages of development and is scheduled to take effect in March 2026	Multi-layered governance system MSP recently approved and can integrate existing and new MPAs and the MSFD and WFD Enhanced coordination between the MSP and MPA authorities Improved conservation objectives and integration of socio-economic considerations into MPAs management	Harmonization of legal instruments Leverage existing decrees and commitments to foster collaboration Develop technical standards and simplify regulations to support sustainable development LSI should be integrated in legislation	At national waters MPAs serve as the primary tool for the management of cetaceans and VME Beyond national waters, FRA under GFCM are considered the most relevant tool for VME protection.	MSP Plan has a comprehensive governance framework by aligning with EU and national legislation and strategies Need for improved coherence between MPA network and spatial planning Integration of extended or newly designated MPAs in the MSP plan revision	Comprehensive legal MSP framework through EU and national legislation Engage a wide range of stakeholders in the decision-making process Adaptive management and monitoring of MPAs

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5 Key pitfalls and enablers for ecosystem-based management of key economic sectors for the five MSP4BIO EU Sea Basins

The six MSP4BIO test sites focus on five blue economy sectors: Fishery, Aquaculture, Tourism, Extraction of marine non-living resources, and Renewables, with each site selecting its most prioritized sectors. Below is a summary of the identified challenges and enablers across the five sea basins involved in the project; additional details are available in Table 4 and Table 5. The EBM within the framework of the MSP was analysed from the ground up, originating from the test site outcomes detailed in the D5.3, and tailored to each specific sea basin.

North Sea: Belgian part

As one of the busiest and most intensively used Exclusive Economic Zones (EEZs) in the world, the Belgian part of the North Sea (BPNS) faces a range of challenges in implementing effective EBM. Key economic sectors addressed in MSP4BIO project share overarching obstacles that have hindered the implementation of EBM to date.

The most pressing obstacle in the BPNS is limited marine space which leads to spatial conflicts among activities. Each sector pursues its own interests and objectives, with various stakeholder groups and authorities involved. There is a clear need for better coordination of marine activities and development of measures that are acceptable and acknowledged by all stakeholders. Furthermore, Belgium operates under a centralized governance system that is fragmented across multiple government authorities. Stakeholders often only have the opportunity to comment on final drafts or management plans produced by government entities, playing a mainly consultative role without real decision-making power. Yet, stakeholders can be a key enabler of effective EBM, provided they feel heard, understood, and are actively engaged throughout the process. In the fisheries sector, for example, initiatives such as the Maatschappelijk Covenant/Flemish Fisheries Trajectory (2021–2025) offer promising tools for establishing a more transparent and participatory process. These initiatives need continued support to promote compliance with conservation measures, despite the inherent difficulty of quantifying stakeholder engagement outcomes.

Another key pitfall is the fragmented governance of marine management, a challenge for many EU Member States. Regulatory competencies for the marine environment are allocated across different tiers of government, complicating the alignment of stakeholder interests with protection measures and communication between authorities. In Belgium, the main authorities involved are *inter alia* the European Commission, Federal government, Flemish government and OSPAR. While the Federal Government is primarily responsible for conservation, the Flemish Government and European Commission oversee fisheries and aquaculture. This division of responsibilities across closely related and sometimes competing sectors poses a significant barrier to implementing EBM effectively. The fragmentation not only complicates coordination

between authorities but also hiders the cohesive strategy implementation. Without clear demarcation lines of responsibility and cooperation, collecting and sharing data needed to support effective decision-making becomes difficult. In this context, robust environmental monitoring and data transparency are essential foundations for EBM.

Management strategies must be based on reliable data about environmental conditions and the impacts of human activities across all sectors. Only with this data priorities can be set, and measures evaluated and adapted as needed. However, significant data gaps remain in Belgium − especially concerning long-term monitoring and pelagic ecosystems. These gaps hinder informed decision-making and limit the effectiveness of adaptive management approaches.

A key opportunity to advance EBM is the revision of the Belgian MSP, which will come into force in 2026. The revision process should have created a platform to discuss current sectorial needs across government entities and stakeholders that supports the new definition of the plan. With initiatives such as the National Strategic Plan for Aquaculture (2021–2030) and Belgium's Blue Economy Strategy, promoting sustainable business models, supporting green certifications, eco-labels, and sustainable tourism infrastructure, Belgium takes important steps towards EBM; however, an urge to prioritise efforts for sustainable and resilient ecosystems over short-term economic profit remains.

Baltic Sea: entire sea basin

Implementing EBM across key economic sectors in the Baltic Sea reveals persistent structural challenges, but also growing institutional momentum and policy mechanisms that enable more integrated, sustainable approaches. In the fisheries sector, fragmented policy coherence and biodiversity blind spots remain significant hurdles. National strategies often operate in isolation from spatial conservation efforts, and integration with the CFP remains limited. Spatial planning tools are often low in resolution, making it difficult to assess cumulative pressures or identify ecologically important areas. Stakeholder engagement in biodiversity discussions is still insufficient, and efforts to limit harmful practices, like bottom trawling in sensitive habitats, frequently encounter socio-economic resistance.

Yet, strong enablers are present. The Baltic Sea Action Plan (BSAP), revised in 2021, offers a robust regional framework for aligning sectoral measures with ecological objectives. HELCOM's Fish Group and its recommendations provide non-binding but technically grounded guidance for sustainable fisheries, such as trawling limits and spawning area protection. These initiatives promote a shift toward more ecosystem-aware practices, even if implementation remains uneven.

In aquaculture, rapid growth has outpaced biodiversity safeguards, and cumulative impacts like nutrient loading and chemical use are under-assessed in spatial planning. However, enabling structures like the HELCOM Pressure Group and the Regional Aquaculture Dialogue are fostering stakeholder engagement and supporting best available techniques (BAT) and best environmental practices (BEP). Nutrient load

reduction targets and tools like the HELCOM HOLAS assessments further strengthen the foundation for sustainable aquaculture development.

Tourism, though often overlooked in spatial trade-off assessments, is a growing pressure in ecologically sensitive areas like archipelagos and shallow bays. MSPs rarely monitor the biodiversity impact of seasonal tourism despite overlapping with MPA networks. Still, the Baltic Sea Tourism Center and initiatives under the EU Strategy for the Baltic Sea Region (EUSBSR) are beginning to support cross-sectoral cooperation and cultural considerations in ecosystem-based planning, signaling the potential for greater integration.

Non-living marine resource extraction, including sand and gravel, continues within sensitive or even protected areas. There is still no regionally agreed framework to guide sea-floor mining activities in a biodiversity-sensitive manner. Nonetheless, recent efforts, such as the HELCOM Guidelines for management of dredged material at sea and the expert group on dredging operation, offer critical technical support and a policy entry point for reducing ecological impacts from seabed disturbance.

Offshore renewable energy presents both a challenge and an opportunity. While site allocation often fails to fully incorporate biodiversity sensitivity, and decision support tools are applied inconsistently, significant regional cooperation is emerging. The HELCOM-VASAB MSP Working Group and its data expert subgroup are central in promoting integrated offshore wind planning. Projects like Baltic InteGrid and EUSBSR dialogues are helping to align energy development with environmental and spatial objectives, offering promising avenues for transboundary cooperation and cumulative impact assessment.

In sum, while key pitfalls persist, especially fragmentation, knowledge gaps, and limited stakeholder integration, ongoing regional coordination under HELCOM and related platforms is building a solid enabling environment for advancing ecosystem-based management in the

Atlantic Ocean: focus on Graciosa Island and Cadiz Bay

A central and recurring issue is the lack of coherent governance and policy alignment. Different regulatory bodies (e.g., environmental protection and fisheries regulation) often operate in silos with conflicting mandates (Hey, 2022). Additionally, the CFP, despite aiming for an EBA, prioritizes maximum sustainable yield for individual fish stocks, overlooking broader ecosystem considerations like predator-prey relationships, bycatch, and habitat impacts. MSP authorities frequently lack the mandate to influence fisheries management or mainstream biodiversity across sectors, leading to policy inconsistencies and the continuation of harmful practices. This institutional disconnect as well as weak links between environmental legislation and fisheries regulation make comprehensive EBM implementation challenging and the evaluation of conservation measures difficult.

EBM is hampered by insufficient data and a limited comprehension of complex marine ecosystems. While single-species stock assessment in the North-East Atlantic is well-developed, understanding wider ecosystem dynamics − like food webs, habitat

connectivity, and climate change impacts − remains a significant challenge. Stakeholders frequently highlight a "gap of limited data availability" for informing MSP and MPA planning (D5.1, D5.2, D5.3). Monitoring programs are often incomplete and inconsistent across countries, making it difficult to comprehensively assess ecosystem health, particularly for complex good environmental status' descriptors like food web integrity or seafloor integrity (EEA, 2025; European Commission, 2025; D6.1). For instance, in Graciosa Island, inadequate baseline data and insufficient monitoring of both ecological and socioeconomic impacts directly undermine decision-making and enforcement, and the failure to conduct integrated ecosystem or cumulative impact assessments limits effective trade-off management.

Current management frameworks struggle to adapt, with insufficient integration of climate change projections into fisheries and spatial planning (European Commission, 2025; D5.1). Climate-driven shifts in fish stocks have led to international disputes rather than coordinated ecosystem responses, underscoring the urgent need for transboundary, large-scale cooperation that current frameworks often lack (D5.3).

Coastal communities' reliance on specific fisheries can create political pressure to maximize catches, even at the expense of environmental sustainability. Furthermore, the unequal distribution of costs and benefits from conservation measures may lead to resistance. Imposing restrictions on specific fleets without adequate compensation or alternative livelihoods undermines EBM efforts and erode trust. This is compounded by limited stakeholder engagement, where environmental protection is sometimes viewed as a competing interest rather than a foundational necessity for all marine activities.

Finally, it is important to note that despite the existence of the OSPAR MPA network, its effectiveness is questionable. Over 70% of the network has protection levels too low to provide any measurable ecological advantage (Roessger et al., 2022). This means that harmful activities may continue, failing to deliver intended conservation outcomes.

The OSPAR–NEAFC Collective Arrangement is a promising example of cross-sectoral coordination in ABNJ, linking fisheries regulation with marine conservation goals. There's a clear need to activate and expand such joint governance platforms. At the EU level, the Atlantic Action Plan 2.0 and Guidelines for implementing an Ecosystem-Based Approach in Maritime Spatial Planning (European Commission, 2021) provide frameworks for cooperation. Portugal's adherence to EU directives (e.g., MSFD, Birds/Habitats Directives) and international agreements (e.g., OSPAR), coupled with national legislation and multi-ministerial cooperation (e.g., in France and Spain), strengthens conservation efforts. Policy alignment and legal coherence across EU directives (MSFD, MSPD, CFP) are crucial, requiring crosswalks and policy audits.

Multiannual Fisheries Management Plans under the CFP, along with OSPAR's Ecological Quality Objectives (EcoQOs) and MSFD descriptors (3, 4, and 6), provide a regulatory basis and indicators for ecosystem-based fisheries assessment and management. However, these need to be further strengthened to genuinely incorporate ecosystem considerations. Enhanced data sharing through open-access platforms (e.g., EMODnet, AquaSpace) and prioritized investment in monitoring under-assessed ecosystem indicators are critical for evidence-based decision-making. Initiatives like Portugal's

MoniCO program actively monitor marine resources, improving ecosystem understanding.

Deepening co-design and participatory governance processes that genuinely involve fishers, local communities, and other stakeholders from the outset is crucial to build trust and ensure buy-in (D5.2). The Graciosa CoP in the Azores is a good example of co-validation and shared understanding (D5.3, Stancheva *et al.,* 2025). Critically, providing compensation schemes, alternative livelihoods, or blue economy transition plans for communities affected by restrictions directly addresses trade-off resistance.

A key take-home message is the need to reframe conservation not as a competing sectoral interest, but as the fundamental basis for all economic activity in the marine environment. This narrative shift, institutionalized in policy and through capacity-building programs, is vital for long-term fisheries productivity and overall marine health. Moreover, improving the quality and effectiveness of MPAs through stronger protection levels would create mutual benefits for ecosystems and sectors.

NW Mediterranean Sea

Implementing EBM across key maritime sectors in the NW Mediterranean reveals entrenched governance fragmentation, scale mismatches, and data limitations that continue to hinder biodiversity mainstreaming. However, growing alignment between regional initiatives, EU policy objectives, and MSP frameworks presents opportunities to advance ecosystem-based approaches.

In the fisheries sector, persistent fragmentation between EU and non-EU coastal states contributes to regulatory inconsistencies across national boundaries and within spatial regimes, including MPAs. Spatial and institutional misalignments between fisheries management - typically conducted at broad subregional scales and site-based MPA governance hinder the coherent protection of mobile and vulnerable species, such as cetaceans and VMEs. This is particularly problematic for transboundary ecosystems, like those in the Pelagos Sanctuary, where coordination among fisheries and environmental authorities is essential. Data gaps, particularly concerning small-scale and recreational fisheries, further limit the application of tools like the ESE framework. Pressures from destructive gear types, notably bottom trawling, persist across sensitive areas. However, key enablers are emerging. Regional bodies such as the GFCM play a central role in promoting science-based approaches through FRAs and shared stock assessments. The increasing use of participatory mapping, digital DSTs, and fisher-led data collection, particularly in deep-sea contexts — facilitates integration of socio-ecological objectives and enhances spatial precision in planning.

In aquaculture, spatial conflicts with MPAs are intensifying as farm locations increasingly overlap with protected areas and ecologically sensitive coastal zones. Environmental pressures such as nutrient loading, disease transmission, and escape of non-native species remain under-assessed in spatial plans. Nonetheless, the GFCM 2030 Strategy offers a coherent regional policy vision through its “blue transformation” pathway. Anchored in ecosystem-based planning, it promotes nature-based solutions, digital

innovation, and effective spatial planning tools. Through responsible practices, such as low-impact farming systems, alternative feeds, and reduced plastic use, aquaculture can provide environmental services that complement conservation efforts, support biodiversity, and reduce pressure on wild stocks.

Coastal and marine tourism in MPAs can significantly undermine conservation objectives through a complex web of pressures, especially in popular sites. Overcrowding exacerbates habitat stress, including the loss of seagrass meadows like *Posidonia Oceanica*, and increases pollution, noise, and the spread of invasive species. Leisure boating and cruise tourism contribute to anchor damage, collisions with marine fauna, and chronic disturbance to sensitive species, while high carbon emissions intensify climate change impacts. Yet, sustainable and nature-based tourism, such as guided wildlife experiences can support MPA objectives by promoting environmental awareness, fostering local stewardship, and offering sustainable economic opportunities. The Pelagos Sanctuary illustrates how responsible whale watching, based on strict codes of conduct and cross-border cooperation, can both protect biodiversity and benefit coastal communities.

Disparities in regulatory frameworks and governance approaches across the NW Mediterranean create considerable barriers to the deployment of Offshore Wind Farms (OWFs), with fragmented permitting procedures, uneven MSP progress, and inconsistent environmental protection, especially between EU and non-EU countries. Inadequate monitoring protocols, limit the acceptability of OWFs within MPAs. Ecological impacts like seabird collisions, underwater noise, and habitat degradation must be addressed early, particularly given the Mediterranean's deep waters, sensitive habitats, and spatial pressures from tourism, fisheries, and transport. Floating wind turbines offer opportunities to minimize user conflicts by allowing installations further offshore. Countries such as France, Italy, and Spain are advancing by adapting EU policies, supported by political momentum through the EGD and Recovery and Resilience Facility, while tailored regulatory frameworks that integrate MSP can further enable ecosystem-based offshore wind development.

In sum, while the NW Mediterranean faces structural barriers — fragmented governance, scale mismatches, and persistent data gaps — regional cooperation platforms, such as GFCM, Pelagos Sanctuary and Barcelona Convention, EU strategic frameworks, and the evolution of national MSP processes are progressively building the institutional capacity and technical tools needed to operationalize ecosystem-based management across sectors.

Black Sea (Bulgaria and Romania)

The adoption of an EBM in blue economy sectors in the Black Sea underscores persistent structural issues, while also reflecting a rise in institutional momentum in the context of the adopted MSP plans for Romania and Bulgaria as well as by the regional frameworks to support healthy and resilient marine ecosystems.

Fisheries are subject to limited regulations within MPAs, leading to adverse effects, and illegal bottom trawling along with the destruction of critical habitats remains a prevalent issue. There is a lack of adequate collaboration among institutions and unclear mandates: while the MSP plan encompasses the fishery sector, it does not have the mandate to effectively enforce necessary measures that would influence fisheries management or incorporate biodiversity considerations across different sectors. Fisheries and in particular aquaculture sector compete for space with coastal and maritime tourism, port activities, shipping, extraction of non-living resources (offshore oil and gas), and MPAs. For instance, in the Bulgarian maritime space the aquaculture zones overlap with the MPAs, as some mussel farms are located within the Natura 2000 network.

Insufficient integration of aquaculture within MSP is another obstacle for EBM. The scenarios outlined in the Bulgarian MSP Plan for the future advancement of aquaculture lack adequate scientific justification and methodology, as well as detailed consideration for multi-use opportunities with other sectors. The plan does not allocate future (reserved) zones for offshore aquaculture that could potentially overlap with the newly established or expanded MPAs.

The development of tourist infrastructure, such as large resorts and marinas, has resulted in beach erosion, wetland degradation, and damage to important coastal and marine habitats that are critical for biodiversity and carbon storage (Stanchev *et al.,* 2015). The sector is predominantly influenced by conventional business models that threaten ecosystems. Coastal and maritime tourism is closely reliant on mass tourism, experiencing seasonal peaks at few major resorts. Additionally, insufficient sewage treatment facilities in some coastal areas have led to a deterioration in water quality, which is essential for bathing tourism. The accumulation of beach and marine litter in heavily visited tourist areas during peak seasons has a detrimental effect on marine ecosystems. There are no clearly defined prohibitions or restrictions in MPAs concerning tourism, which consequently reduces the effectiveness of conservation measures.

Competition for space and usage is critical for the emerging sector of OWFs: the majority of maritime activities occur onshore, which restricts sea space for both established and emerging sectors to achieve the goals of the EGD climate adaptation and Biodiversity Strategy, such as energy transition and the designation of 30% protected areas.

Yet, national legislation and strategic/multiannual plans concerning fisheries and aquaculture are aligned with the EU legislation and the implementation of the CFP. Bulgaria's Biodiversity Strategy 2030, approved in 2022, seeks to incorporate biodiversity considerations into sectoral policies, especially in the fisheries sector. The temporary bans established in the Bulgarian Fisheries and Aquaculture Act serve to identify areas where beam trawling is not permitted, thereby minimizing the impact of fishing on bottom ecosystems in the Black Sea. Co-location of maritime uses/multi-use approach in MSP is another enabler for EBM: fisheries sector gains from the beneficial spillover effects produced by MPAs where fisheries resources are effectively safeguarded. Synergies with other maritime activities, for instance, the relationship between fisheries and aquaculture are well acknowledged.

The Bulgarian MSP Plan Specific Objective 2.4 provides guidance for the sustainable development of aquaculture and the removal of abandoned aquaculture facilities in relation to plastic debris. The Multiannual National Strategic Plan for Aquaculture in Bulgaria (2021-2027) aims to: 1) encourage environmentally sustainable aquaculture practices that ensure efficient water usage; 2) increase the demand for locally sourced and sustainably produced aquaculture products. It is essential to enhance dialogue and coordination between the competent MSP and aquaculture authorities.

The GFCM 2030 strategy for sustainable fisheries and aquaculture in the Mediterranean and Black Sea encompasses ambitious goals to improve scientific knowledge and data collection on the region's most pressing fisheries challenges, while fostering the adoption of effective management strategies. A collaborative governance strategy that incorporates aquaculture zoning would facilitate sustainable growth in the Black Sea, as supported by this strategy, (Massa et al., 2021).

MSP plays a key role in promoting sustainable tourism, particularly in coastal and maritime areas, which rely on the quality of the environment and seawater conditions, as well as the balance between human activities and ecological preservation.

The Bulgarian MSP plan includes designated areas for potential future use, which may be allocated for OWF developments should there be interest from investors. The MSP4BIO PW4Blue tool for CEA enables the analysis and evaluation of the potential impacts of emerging OWF developments on marine ecosystems (in particular on marine mammals).

As a sum, MSP in the Black Sea integrates solid governance framework to be ecosystem- and science-based, thus being the cornerstone for climate-smart- and EGD-compliant MSP in general. MSP should contribute to keeping environmental pressures within ecosystem capacity limits, and to safeguard the natural functions of the marine ecosystems. This requires early and careful assessment of single and cumulative impacts, the development of alternative planning solutions to minimize impacts, and the identification of mitigation measures.

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Table 4. Identified pitfalls for ecosystem-based management of key economic sectors for five MSP4BIO EU Sea Basins

Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
Fishery	• **Fragmented policy coherence and biodiversity blind spots**: Mentioned as an issue especially in relation to different sectoral strategies and lack of integration between MSP and biodiversity goals. • **Lack of cumulative pressure assessment**: Cited as a recurring issue in the Baltic test site, with limited tools and understanding of pressures and trade-offs. • **Limited stakeholder engagement in biodiversity discussions**: The need to improve stakeholder involvement in MSP and MPA planning is explicitly stated. • **Limited monitoring beyond target species**: Fisheries monitoring often focuses on commercially valuable species, neglecting the broader ecological impacts on non-target species, habitats, and trophic interactions. • **Socio-economic resistance to restrictive measures:** Efforts to limit harmful fishing practices, like bottom trawling in sensitive habitats, often face resistance from the fishing sector, hampering stricter EBM-aligned measures.	• **Fragmented governance**: In Belgium, marine environmental regulation is fragmented, with federal jurisdiction overseeing nature restoration, while fishing regulation is managed by the Flemish governance. This division hinders effective biodiversity protection and coordination among stakeholders (D6.1). • **Lack of enforcement** Implementing conservation measures in MPAs is particularly challenging when other MS operate in the same area, as any restrictive measures must follow the complex procedure set out in Article 11 of the CFP, requiring coordination and agreement among all affected MS (D6.1) • **Monitoring and reporting gaps:** This could affect environmental protection negatively or may cause misleading outcomes of protection measures. Important for ensuring an accurate portrait of conservation outcomes and define necessary conservation measures. For pelagic habitat, baseline data must be created (D6.1 – D5.2/1) • **Overfishing and stock depletion:** Despite improvements in fisheries management, overfishing remains a significant issue for certain commercial species in the	• **Absence of management plans** and clearly defined conservation goals for many marine protected areas hampers effective implementation. • **Inadequate baseline data**, insufficient monitoring of ecological and socioeconomic impacts, and reliance on annual funding, impact decision-making and enforcement. • **Failure to conduct integrated ecosystem or cumulative impact** assessments limits the ability to manage trade-offs effectively. • **Legal MSP framework** prioritizes ocean-based economic activities over environmental sustainability, despite acknowledging an ecosystem-based approach. • **Institutional silos and unclear mandates hamper EBA.** In many jurisdictions MSP authorities lack the mandate or mechanisms to influence fisheries management or to mainstream biodiversity across sectors. Harmful fishing practices (e.g., bottom trawling) may continue unless fisheries-specific regulations are enacted, even if spatial plans identify a conflict (D5.1). • **Varying perception of environmental protection's role.** MSP4BIO interviews revealed varied views on	• **Governance complexity across neighbouring countries:** regulatory differences between countries leading to challenges in balancing conservation and economic activities in a highly fished area and to regulatory differences between countries. • **Data gaps**: lack of harmonized and consistent data on ecological species distribution and abundance (e.g. VMEs). The effective implementation of the ESE framework highly relies on the capacity to gather necessary data. Lack of data on the distribution of fishing pressure is also an issue, particularly in the southern and eastern Mediterranean. • **Different spatial scales** for MPAs and fisheries management. • **Fishing pressure on cetaceans and VMEs**: lack of effective protection for cetaceans and VMEs. Reducing this pressure through management measures (e.g., permanent fishing closures and site-based or sector-based regulations) involves trade-offs with economic activities, with bottom-trawling being the main concern in this test site.	• **Fisheries are regulated to a limited extent in MPAs,** resulting in negative impacts. Certain fishing methods, particularly dredging and trawling, are subject to restrictions. In the Black Sea, the capture of fish and other aquatic organisms is forbidden during their breeding season. • **Conflicts with other maritime activities**: commercial fishing competes with other maritime activities in terms of access to resources and space. This is the case with respect to coastal tourism, recreational fishing, shipping, offshore oil and gas, and emerging OWF. • **Common practice of Illegal bottom trawling** and destruction of valuable habitats in MPAs. • **Climate change can have a significant impact** on biodiversity and habitats, affecting different fish/shellfish species in the Black Sea. • **Lack of Institutional collaboration and uncertain mandates:** the MSP plan, while incorporating the fishery sector, lacks the necessary measures to influence fisheries management or to incorporate biodiversity considerations across different sectors. This is governed by the CFP and national legislation pertaining to the Fisheries and Aquaculture Act.

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		Belgian North Sea. This overexploitation threatens the sustainability of fish populations and the broader marine ecosystem. (Source: État belge, 2025)	environmental protection, with some stakeholders seeing it as a sectoral interest, while others argued it should be the foundation for all sectors (D5.1).		● In Romania socio-economic resistance to restrictive measures: efforts to limit harmful fishing practices (like beam-trawling in sensitive habitats) often face resistance from the fishing sector.
Examples/ Lessons learned	● While certain countries (e.g. Estonia) implement restrictions such as trawling limits in shallow waters to protect the seabed, broader biodiversity protection is often secondary to economic and production concerns. ● For instance, trawling restrictions in Estonia apply only in areas deeper than 20 m, leaving ecologically sensitive shallow habitats vulnerable. ● Fragmentation between national and EU-level policies (e.g. CFP vs national plans) further complicates coherence. ● Despite the presence of HELCOM MPAs, integration between fisheries policy and spatial conservation efforts remains partial, with MPAs sometimes not effectively aligned with key spawning or nursery habitats	● Implementation of Specific Fisheries Management Measures. In 2016, a Joint Recommendation was elaborated, accepted by all the concerned member states (in the Scheveningen group) and send to the EC. A delegated Act containing the proposed measures was discussed in the European Parliament in June 2018 and rejected. The Parliament's decision was based on concerns that the proposed measures did not sufficiently protect vulnerable marine ecosystems and did not comply with EU environmental laws, particularly the Birds and Habitats Directives. (Source: European Parliament. 2018) • Since governance approach is unlikely to change completely in the next years, transparent processes with an emphasis on continuous communication between responsible entities is key. A promising approach is the renewable of the MSP strategy coming into force 2026. If done with satisfactory engagement of stakeholders and the public, this would not only improve activity	● The Graciosa site-specific planning solution sought to bridge gaps in MPA management by integrating it with MSP using the Trade-offs method (D4.3). The workshop validated a proposal for an MPA, IUCN IV, where the sustainable activities could be carried on under specific regulations. ● Fragmented governance: Fisheries management, biodiversity conservation, and spatial planning often operate independently. OSPAR focuses on marine environmental protection and establishing MPAs, but does not regulate fisheries, which falls under the EU's CFP or the NEAFC for international waters. This division necessitates collaboration with fisheries authorities for OSPAR's conservation efforts to succeed (D6.1). ● A comprehensive evaluation of ecosystem health is crucial (European Environment Agency, 2025). Insufficient monitoring of implemented measures hinders conservation efforts (D6.1). While EU Member States and OSPAR have set up monitoring for Good Environmental Status and MPAs,	● Data acquisition on VMEs: Improving data on the distribution and abundance could enhance the identification of suitable Strong Protection Zones. As VMEs are good indicators of where to establish these zones, better data would support efforts to achieve the 10% strong protection target. ● Tools to gather data can be site-specific because they depend on data availability and quality necessary to answer specific management needs.	● MPAs in the Bulgarian test site coincide with fisheries activities, however, stakeholders in trade-off exercise argued that this sector is vital for traditional livelihoods. ● Fishing activities and MPAs – using of fishing tools that can impact the seabed integrity, extraction of marine protected species, mollusk harvesting and marine mammals' bycatch. ● Protection of biodiversity is not a stated goal within the fisheries policy; the new EMFAF Programme will provide financial assistance to support management and enlargement of MPAs and combat marine litter. The programme will reinforce the environmental actions undertaken under the Bulgarian Prioritized Action Framework for Natura 2000: monitoring of marine habitats and species, based on scientific knowledge in line with the EU's Birds and Habitats Directives (D6.1). ● In Romania an ongoing debate between the fishing sector and nature conservation authorities has emerged when the contractor proposed strictly protectes areas (where all activities are banned, fisheries included), without any

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
		regulation but further increase compliance and understanding for measures. ● Especially in fishing, regional collaboration through OSPAR or the Greater North Sea Basin Initiative, has to be strengthened promptly to find consensus of fishing regulations. Besides transnational collaboration, it is crucial to work with local fishermen and industry to enforce measures.	these programs often lack consistency and completeness, leaving some ecosystem criteria unclear or difficult to measure. ● In the Bay of Biscay, efforts to reduce dolphin bycatch—such as temporal closures of trawl fisheries or stricter gear regulations—have triggered conflicts between environmental authorities and the fishing sector. The 2024 European Commission decision, highlighted the challenge: some fleets, particularly artisanal fishers, shouldered a disproportionate burden, while the ecological benefits of dolphin conservation remained less tangible or visible to those affected. Lesson learned: without compensation mechanisms, clear communication of benefits, and co-designed solutions, even well-intentioned conservation measures can meet resistance and erode trust in the EBM process.		consultation with the potential users of the maritime space, in order to align to the EU Biodiversity Strategy for 2030 (10% strictly protected). At the moment, the process is blocked due to this lack of communication.
Aquaculture	● **Rapid sector growth with limited biodiversity safeguards**: General concerns about sector expansion outpacing planning are noted; however, aquaculture-specific details are limited. ● **Limited coordination with other marine uses**: Broadly supported by mentions of siloed sector planning and lack of trade-off assessments.	● **Fragmented governance**: In Belgium, marine environmental regulation is fragmented, with federal jurisdiction overseeing nature restoration, while aquaculture regulation is managed by the Flemish governance. This division hinders effective biodiversity protection and coordination among stakeholders (D6.1). ● **Water Column Management:** the MSP 2026-2034 does not	● **Weak integration of aquaculture in MSP.** Aquaculture planning continues to be largely reactive and conflict-avoidance-based, rather than being aligned with EBM principles (e.g., siting based on ecosystem services or ecological thresholds). The EU AQUASPACE project, cited by OSPAR, confirms that MSP for aquaculture often lacks strategic spatial integration, particularly	● **Ecological degradation**: Intensive aquaculture can introduce excess nutrients, organic waste, and chemical residues, leading to eutrophication, oxygen depletion, and habitat degradation in MPAs ● **Depleted wild fish populations**: Fish farming in the Mediterranean is shifting from herbivorous to predatory species like sea bass and bluefin tuna, increasing demand for wild fish	● **Competition for space and use:** competition for space with coastal and maritime tourism, port activities, shipping, extraction of non-living resources (offshore oil and gas), fisheries and MPAs. Aquaculture zones overlap with MPAs, as some mussel farms are located within Natura 2000. These farms can provide biological treatment by filtering suspended particles in seawater. However, the waste produced by shellfish farming makes these

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	● **Knowledge gaps on cumulative impact**: Aquaculture's cumulative impacts, such as nutrient enrichment, chemical use, and habitat alteration, are not well understood or considered in spatial planning or sector regulation.	explicitly have a water column management, but it includes provisions that pertain to the vertical use of marine space (aquaculture, seabed disturbing activities) ● **Multi-Use Aquaculture**: Belgium's MSP encourages multi-use, Annex 2 of the MSP states "By 2050, the principle of multiple space use will be the norm for all space use within the Belgian part of the North Sea." (FOD Volksgezondheid, 2020). Certain activities are thought to contribute to ecological value and potentially benefit nature protection implicitly, such as aquaculture projects that could reduce eutrophication (FOD Volksgezondheid, 2020). However, in terms of multi-use within Natura 2000 sites, Walsh and Loch (2022) concluded that "A clear, evidence-based scientific rationale for multi-use within designated protected areas is not provided" (Source: D 5.1). ● **Limited spatial availability and high competition among sectors**: The Belgian North Sea is one of the most intensively used marine areas globally. This limited space is shared among various activities, including shipping, fishing, offshore energy, and conservation efforts. The high demand for space complicates the allocation of suitable areas for aquaculture development, making it	offshore (OSPAR Commission, 2023) ● **Inadequate monitoring of environmental impacts monitoring of aquaculture's environmental impacts**. While some OSPAR countries (e.g., Norway, UK) have national monitoring programs, the quality and consistency of environmental monitoring (especially for nutrient inputs, benthic impacts, sea lice, and escapes) varies significantly. Some countries have no data publicly available. ● **Litter from aquaculture.** Aquaculture, particularly shellfish farming, is recognized by OSPAR as a contributor to marine litter through materials such as ropes, nets, mussel socks, and oyster bags. The Regional Action Plan for Marine Litter includes measures to reduce pollution through education, industry sustainability initiatives, and better waste management. ● **Managing transboundary environmental impacts.** Transboundary environmental impacts from aquaculture—such as disease transmission, sea lice proliferation, and escapes of farmed fish—are recognized as risks to wild populations.	feed from already overexploited stocks. ● **Risks from Non-Indigenous species**: Use of non-native species in aquaculture can lead to escapes, risking genetic mixing with native populations and impacting local biodiversity. ● **Disease and parasite Transfer**: Dense aquaculture operations can become reservoirs for pathogens and parasites, which may then spread to wild species within the MPA ● **Spatial and use conflicts**: Aquaculture installations can conflict with MPA goals like conservation, tourism, and fisheries, adding to ecosystem stress alongside other human activities.	activities incompatible, emphasizing the need to relocate the sector offshore. ● **Environmental and human-induced factors**: surface seawater temperature variations, climate change impacts, land-based pollutants. Climate change issues are only generally considered in the Bulgarian MSP Plan and its EIA report, with regards to potential negative impacts on aquaculture. ●**Inadequate integration of aquaculture in MSP:** Plan`s scenarios for future development of aquaculture are not sufficiently supported with scientific rational and methodology, or for multi-use opportunities with other sectors. The Plan does not envisage future (reserved) areas for offshore aquaculture that might overlap with the newly designated or extended MPAs. ● **Bulgarian MSP Plan does not provide CEA** to its EIA report. These factors could jeopardize the EGD objectives and related policies for biodiversity and ecosystem protection and restoration. ● **The development of marine aquaculture is highly dependent on the seawater quality:** mussel farms also decrease and mitigate nutrient pollutants, reduce local climate change impacts (e.g. carbon capture), support fish stocks, among the others;

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		challenging to implement ecosystem-based management effectively. (Source: D5.1 Sustainable climate friendly; circular Blue Economy in the BANOS Area: Current Status and Assessment and Monitoring Approaches) ● **Top-down approach in MPA/MSP design and implementation:** In Belgium, enhancing stakeholder engagement is crucial for diverse perspectives in aquaculture planning. This includes fostering transparent communication and participatory decision-making. Although Belgian authorities maintain transparency, they limit stakeholder involvement to a consultative role, excluding them from early decision-making phases. (Source: Seas at Risk, 2014) ● **Data gaps and monitoring challenges:** Implementing EBM relies on comprehensive and up-to-date environmental and socio-economic data. In Belgium, there are challenges related to data availability, quality, and sharing among stakeholders. These data gaps impede the ability to assess ecosystem health, monitor aquaculture impacts, and make informed management decisions.			● **Outdated national legislation:** Bulgarian ordinance for authorization/licensing for aquaculture farms is up to date and does not include the permissions for the development of offshore aquaculture. This requires updating regulations and aligning related policies. ● **Limited development of the sector** due to environmental drawbacks: whereas Romania's Black Sea coastline is limited to 245 km, of which more than half is represented by the Danube Delta, traditional Romanian aquaculture has been based mainly on freshwater fish species. ● **Legislative bottlenecks**: the absence of legislation concerning the microbiological classification and water concession basically impeded any commercial development of this sector at the Romanian coast. ● **Limited coordination with other marine uses**: the need to integrate aquaculture with other uses is imperative
Examples/ Lessons learned	● MPAs are rarely used to guide aquaculture site selection or to prevent habitat degradation in	Finalized in 2020, the North Sea Agreement is a comprehensive political agreement between the Dutch government and a broad	● In the North-East Atlantic, offshore aquaculture development remains poorly integrated into MSP, despite the sector's growing spatial footprint.	● In the Mediterranean Sea, aquaculture is integrated in the design of MSP plans. Nevertheless, the complexity of maritime laws hinders the	Findings and lessons from MSP-GREEN Project (Cornet et al, 2023):

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	sensitive or nearshore environments.	coalition of different stakeholders. including: - fishing sector, - OWF developers, - nature conservation NGOs, - ports and shipping representatives, - coastal provinces It is a great example of cross-sectoral, participatory marine planning that balances conservation with economic use, and offers several best practices that could be upscaled across sea basins.	According to the OSPAR 2023 Aquaculture Feeder Report, planning for aquaculture tends to be reactive and conflict-avoidance-based, with limited application of EBA principles (e.g., ecosystem services, cumulative impacts, or ecological thresholds). The AQUASPACE project further observed that MSP for aquaculture often lacks forward-looking spatial strategies, particularly in offshore areas where conflicts with shipping, fishing, and conservation interests are increasing.	implementation of integrative farms (IMTA) which can be of interest to reduce aquaculture environmental impacts.	● Bulgarian MSP Plan integrates the existing zones with aquaculture farms (located in internal waters, 1 NM distance from the coast) and developed general recommendations to reduce their environmental impacts. The MSP plan does not envisage suitable areas allocated for new onshore or offshore farms, as it is a strategic document, also the offshore farming technology is still under development. ● Bulgaria's inshore waters are crowded with maritime activities, raising the risk of sector conflicts and increased eutrophication from agricultural runoff. In contrast, offshore areas show more stable salinity and temperature, essential for sustainable shellfish aquaculture. ● Models for mussel growth and predictions about the impacts of climate change are still lacking.
Tourism	● **Underestimation of seasonal and cumulative impacts**: Cumulative impacts and limited awareness of tools are identified as regional issues. ● **Limited integration of tourism into spatial planning**: Tourism is mentioned as a key sector in D5.1 but lacks integration in trade-off assessments and MSP coordination.	● **Spatial conflicts and overuse:** The Belgian North Sea is one of the most intensively used marine areas globally, accommodating activities such as shipping, fisheries, offshore wind farms, and tourism. This concentration leads to spatial conflicts, particularly in coastal zones where tourism infrastructure and activities can overlap with other uses, potentially degrading sensitive habitats.	● **Data gaps and inconsistent monitoring.** Tourism and recreational activities are often not classified under standard economic sectors, making it difficult to collect uniform data (OSPAR, 2021). This lack of standardized data hampers the ability to assess the sector's economic importance and environmental impacts comprehensively. ● **Environmental pressures:** physical disturbances (e.g., habitat degradation from boating	● **Coastal Habitat Degradation**: Extensive tourism infrastructure (e.g., hotels, marinas, and cruise terminals) leads to coastal erosion, wetland destruction, and loss of seagrass meadows (Posidonia oceanica), crucial for biodiversity and carbon sequestration. ● **Marine Pollution:** Increased waste, sewage discharge, and plastic pollution from tourism hotspots degrade water quality, harming marine life.	● **Coastal and marine habitat degradation**: tourist infrastructure like huge resorts and marinas leads to beach erosion, wetland destruction, and harm to vital coastal habitats essential for biodiversity and carbon storage. ● **Unsustainable tourism models:** the sector is mainly driven by traditional business models that pose risks to ecosystems. Coastal and maritime tourism relies on mass

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		• **Environmental pressures from tourism.** Tourism contributes to environmental pressures, including marine litter, underwater noise, and habitat disturbance. These impacts can affect marine biodiversity, such as seabirds and marine mammals, and degrade the overall health of the ecosystem. (Source: État belge, 2025) • **Data gaps.** Effective EBM requires robust data on tourism's environmental impacts. However, there are significant data gaps, particularly concerning the cumulative effects of tourism-related activities. This lack of data hampers the ability to make informed decisions and implement adaptive management strategies. • **Policy alignment**. There is a need for clearer policies and regulations that specifically address the intersection of tourism and marine ecosystem health.	and anchoring, boats collision with wildlife), pollutions (e.g., marine litter, wastewater discharge), biological disturbances (e.g., introduction of invasive species). • **Challenges in addressing cumulative impacts.** Tourism activities contribute to cumulative environmental impacts when combined with other sectors like fishing and shipping. Current management approaches often fail to account for these combined effects, leading to underestimation of the total environmental burden.	• **Wildlife Physical Disturbance and Collisions**: Heavy boat traffic and recreational activities (snorkeling, diving, jet skiing) in MPAs disrupt dolphins, whales, and other sensitive species • **Anchor Damage**: Yachting hotspots face severe damage to Posidonia seagrass beds due to inadequately regulated anchoring. • **Overcrowding and Ecosystem Stress**: High tourist influx in MPAs causes habitat degradation, coral trampling, and increased disturbance to nesting sea turtles. • I**ntroduction of Invasive Species**: Ballast water discharge from cruise ships and recreational boats facilitates the spread of invasive species which threaten native biodiversity. • **Carbon Footprint and Climate Change**: The Mediterranean is a leading cruise tourism destination, with high emissions from large ships contributing to pollution and climate change impacts • **Conflicts with Conservation Goals**: Unregulated tourism growth in MPAs can undermine conservation efforts, reducing the effectiveness of marine protection measures.	tourism, with seasonal peaks at a few major resorts. • **Marine pollution/litter:** the insufficient sewage treatment facilities in some coastal areas have led to a deterioration in water quality, crucial for bathing tourism. The accumulation of beach and marine litter in popular tourist spots during peak seasons negatively impacts marine ecosystems. • **Conflicts with marine protection and other uses**: for example, with military trainings, recreational boating and other uses linked to overcrowding, space restriction and safety hazards. Boating may compete with other recreational activities (e.g. swimming) or with different type of boating (e.g. sailboats, motorized vessels, personal water crafts, etc.). • **Lack of tourism restrictions in MPAs:** there are no explicitly introduced prohibitions and restrictions related to tourism, thereby diminishing the efficiency of marine protection measures. •**Uncertainty in MSP Plan**: Bulgarian MSP plan contains general provisions on sustainable tourism and water quality, and mainly relies on the WFD and MSFD objectives.

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Examples/ Lessons learned	● Baltic Sea countries' MSPs do not systematically account for the cumulative impacts of coastal tourism, particularly in ecologically sensitive areas such as archipelagos or shallow bays. ● While many Baltic Sea MPAs overlap with tourism hotspots, few have concrete biodiversity impact monitoring linked to recreational uses.	● From an ecological point of view, the emergence of mass tourism at the coast from the 1930s onwards, with the massive implantation of tourist-recreational accommodation (holiday homes, campsites, weekend accommodation parks, second homes, etc.) has played a major role in the urbanisation of the coastal zone, fragmentation of valuable open space and the disappearance of biotopes. Especially the dune area has experienced a strong fragmentation, partly caused by spatial planning. (Source: Vandaele et al., 2023)	● Stakeholder engagement is often fragmented or occurs too late in the process, leading to conflict, lack of buy-in, or tokenistic participation. In the Azores, tourism was integrated into Coastal Zone Management Plans, yet conflicts emerged with other sectors (like fisheries). Engagement was seen as limited, often without proper feedback or compensation mechanisms. A lack of transparency and co-responsibility hindered effective planning (D5.1). ● EBM requires spatial and temporal mapping of cumulative impacts. D4.2 highlights how tourism contributes to physical damage, biological disturbance, and noise—pressures also associated with other sectors. The cumulative impact on services like nursery grounds and habitat maintenance is among the highest recorded. ● The co-location of responsible tourism or ecotourism with conservation (e.g., diving in artificial reefs near renewable energy installations) was highlighted as a win-win in D4.2. This approach increases stewardship and provides local economic returns while maintaining biodiversity.	● Tourism in the NW Mediterranean attracts over 56 million coastal visitors annually (28 million each in France and Italy) and contributes to the region's status as the world's top tourism destination, hosting 30% of global international arrivals (~300–350 million/year). Despite its economic value, tourism exerts significant environmental and social pressures that remain poorly integrated into MSP due to limited spatial data and planning tools. • Italy: Coastal urbanization linked to mass tourism began as early as the 1950s, transforming villages such as Cinque Terre; Italy now leads Europe in seaborne passenger transport (85.4 million/year) and faces pressures, infrastructure overload, and conflicts with residents. • France: Mass tourism developments from the 1960s, such as La Grande Motte, contribute to cumulative impacts including anchoring damage, noise, pollution, coastal erosion, and landscape fragmentation. Still, tourism remains largely unmapped in MSP:	● In the Bulgarian Black Sea test site practicing of unregulated camping is one of the main challenges causing beach and marine litter. ●The intensification of bathing mass tourism is also expected to increase negative interactions with some sea-based uses (such as recreational boating, scuba diving, fisheries, and aquaculture) as well as with environmental protection needs and the preservation. (Stancheva et al., 2024). ● The concentration of tourists in a few large seaside resorts leads to negative impacts on coastal and marine areas from mass tourism and environmental stress. ● Coastal Erosion Management: efforts in Romania, such as beach nourishment and protection structures, have had mixed results. While they help preserve the shoreline, also conducted to habitats loss affecting marine biodiversity
Marine non-living	● **Permitting of extraction in sensitive or protected areas**: Clearly stated – e.g., sand and gravel extraction not uniformly	● **Paper Parks:** In Belgian waters, many destructive practices persist even within MPA boundaries making them "paper parks" with no priority for	● **Limited understanding of long-term seabed recovery.** Recovery of biota may occur without full geomorphological restoration. Restoration	• **In development, with no clear boundaries between prospection** and future exploitation, increasing attention is paid to the identification,	• **New hydrocarbon extractions in the Black Sea**, with a focus on the Neptun Deep project, the largest natural gas exploitation in the Romanian offshore sector of

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resources extraction	excluded in MPAs across Baltic states. ● **Lack of cumulative and transboundary impact consideration**: D5.1 explicitly mentioned as a Baltic-wide challenge. ●**There is no comprehensive regional document** guiding sea-floor mining towards minimization of environmental impact.	conservation. Practices include dredging and aggregate extraction as indicated in the initial assessment of Belgian marine waters for the MSFD (D5.1; Source: Veiligheid van de Voedselketen en Leefmilieu, 2018) ● **Limited ecological baseline data & uncertainties:** While Belgium has monitoring programs in place, there are still gaps in baseline ecological data, particularly concerning the long-term impacts of sand extraction on benthic habitats and sediment dynamics. These uncertainties make it challenging to predict ecosystem responses accurately. ● **Weak enforcement & compliance challenges:** Ensuring compliance with environmental regulations and extraction limits requires robust monitoring and enforcement mechanisms. Resource constraints and the complexity of marine activities can pose challenges to effective enforcement. (Source: ILVO, Royal Belgium Institut of Natural Sciences and FPS Economy, 2024) ● **Spatial conflicts & limited available space:** The Belgian part of the North Sea is relatively small but hosts numerous activities, including shipping, fishing, renewable energy, and resource extraction. This high density of uses leads to spatial	expectations are not well-calibrated; this undermines decision-making on allowable extraction rates and locations. ● **Challenges in cumulative impact assessment**. ICES has concluded that cumulative impact tools for marine minerals are still lacking, despite relevance to MSFD descriptors (D1, D3, D6, D11, etc.). ● **Habitat-specific vulnerability often overlooked.** Risk of irreversible damage to underrepresented or sensitive habitats due to insufficient baseline habitat maps. ● **Lack of public engagement and transparency**. Limited visibility of extraction practices and their impacts to the public and stakeholders. ● **Underdeveloped mitigation and restoration techniques**. While rotation, seasonal closures, and site-specific planning are recommended (OSPAR, 2021), implementation remains patchy.	description, and cartography of potential extraction sites especially in deep-sea and offshore waters but not all states have clear guidelines for the future of prospected sites (cf. UNOC discourses). ● **No common framework and transboundary agreements for exploitation**. The exploitation of non-living marine resources is regulated through a complex legislative framework which hinders the definition of a common and transparent ecological-based conservation/mitigation panel of actions. Not all the bordering countries have ratified the conventions. ● **Lack of scientific evidence about impacts and recovery potential in highly sensitive areas.** Risk of irreversible damage to underrepresented or sensitive habitats due to insufficient baseline habitat maps. Risk of high incidence on fisheries and climate regulation. ● **Insufficient concerns in research, MPA, MSP on the future** of these unique and complex ecosystems because of an important overall lack of data. For example, only the position of marine platform and LNG regasification terminals are taken into account in the Italian plans. There is a lack of anticipation of extraction impacts.	the Black Sea which is expected to start production in 2027. • **Environmental considerations**: Offshore infrastructure, including drilling platforms and pipelines, can disrupt benthic habitats, affecting marine biodiversity and may cause pollution risks; The pipeline route crosses two Natura 2000 protected areas, requiring strict environmental safeguards and necessitating monitoring and emergency response measures.

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
		conflicts and limits the availability of areas for conservation or new activities. ● **Insufficient Ecosystem Services valuation:** Economic valuations often prioritize direct benefits from activities like sand extraction, while the value of ecosystem services provided by marine habitats is less frequently quantified or integrated into decision-making processes. (Source: Degrendele, Roche and Vandenreyken, n.d)		● **Permitting prospection in sensitive or protected areas**. There is a growing concern about the relevance, appropriateness, and ethics of exploiting these vulnerable, long-lived ecosystems. Indeed, exploration overlaps with VMEs field being considered main local priorities for protection. ● **No inclusion of future challenges**. Regulations, global framework and MSP are not sufficiently integrating future challenges such as water desalination which represent a major challenge for the decades to come. The fate of brine is particularly problematic as it could act in synergy with climate change.	
Examples/ Lessons learned	● This sector is less frequently addressed in biodiversity and MSP-related policies, despite known impacts on seabed integrity and benthic ecosystems. However, permitting involves EIA and licenses must include monitoring obligations.	● Prolonged and intensive sand extraction has led to significant ecological disturbances. In certain areas, two-years post extraction revealed no significant recovery of benthic communities. It underscores the necessity for stringent management and monitoring of sand extraction activities. (Source: Mata, et al., 2024)	● Monitoring programs should not stop at physical metrics (volumes, extraction area) but must track benthic community recovery and ecosystem functions over time. ● EBM must include stakeholders early, apply the precautionary principle where uncertainty is high, and adapt plans based on monitoring.	● Promote science-based moratorium on deep seabed mining as supported by WWF at the International Seabed Authority. Some ongoing projects as the REDRESS project are good examples of encouraging initiatives to promote knowledge acquisition and restauration of deep-sea ecosystems (https://www.ismar.cnr.it/web-content/redress/). ● Monitoring programs should not stop at physical metrics (volumes, extraction area) but must track benthic community recovery and ecosystem functions over time.	● Cumulative Impact Assessment: Studies highlight the importance of evaluating multiple environmental pressures, including habitat loss, hydrocarbon pollution, and invasive species.
Renewables	● **Site allocation lacks biodiversity sensitivity**: Mentioned in the context of	● **Competing spatial demands at sea**: Belgium must balance the goal of effectively protecting 30%	● **Environmental pressures throughout their lifecycle**: construction phase (activities	● **Regulatory and governance disparities across Mediterranean:** MSP and OWF	● **Competition for space and uses:** most maritime activities are onshore, limiting sea space for

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
	offshore wind development, especially in Sweden and Estonia. ● **Insufficient and inconsistent use of decision support tools:** Use of tools like Symphony and PlanWise4Blue is mentioned, but inconsistent application is implied. ● **Institutional fragmentation limits integrated planning**: Suggested by challenges in balancing energy and conservation interests across institutions ● **Lack of adaptive management and post-construction monitoring**: Mentioned more in general terms for MPAs; renewables specifically not covered. ●**Lack of comprehensive knowledge** on large scale impact of OWF and related infrastructure.	of its marine area (with 10% strict protection) under the EU Biodiversity Strategy, with plans to develop 5.8 GW of offshore wind capacity by 2030 and 8 GW by 2040. The Renewable Energy Directive, which sets a 42.5% EU-wide renewable energy target by 2030, further prioritizes wind energy in marine spatial planning, creating tension between conservation and energy objectives. (Source: WindEurope, 2022) ● **Data gaps and monitoring challenges:** Effective EBM requires robust data on environmental conditions and the impacts of renewable energy installations. There are significant data gaps, particularly concerning long-term monitoring and the cumulative effects of multiple projects. This lack of data hampers the ability to make informed decisions and implement adaptive management strategies. ● **Stakeholder involvement and outcomes:** In the Belgian context, stakeholder participation is enacted through consultation processes but never goes beyond this boundary, leading to a lack of consensus and support for management measures. Further, it is hard to quantify outputs of specific stakeholder processes, creating issues in verifying the important role of stakeholder participation in MPA/MSP design.	such as pile driving generate underwater noise), operational phase (physical presence of turbines can lead to habitat loss or alteration), decommissioning phase (removal of structures may further disrupt habitats and marine life). ● **Socioeconomic conflicts:** Wind farms may restrict access to fishing grounds. ● **Conflicts with MPAs.** The development of offshore wind farms can conflict with the objectives of MPAs due to space competition, and wind farms may be sited in or near MPAs, leading to potential ecological disturbances.	development evolving at different paces depending on the countries (including disparities between EU and non-EU countries). ● **Impacts of OWF development on coastal communities:** lack of early stakeholder consultation and engagement in OWF planning phases, particularly regarding blue economic sectors; potential resistance due to visual impacts; tourism concerns ● **Zoning and space availability/competition for space with existing uses**: high concentration of coastal population and economic activities in the MED leading to spatial overlap with economic sectors (e.g. fisheries, shipping, ports infrastructure constraints to integrate OWF logistics) ● **Different legal/regulatory frameworks at MED scale** for the identification of areas suitable for offshore wind development and different permitting processes ● **Specific environmental conditions of the MED region**: Deep waters close to shore, low and variable wind speeds, and high biodiversity require tailored OWF technologies (e.g. floating platforms) ● **Impacts on marine species and habitats** during construction and operation phases: risks of noise pollution, habitat disturbance, birds' collisions.	established and emerging sectors to meet the EGD climate adaptation and Biodiversity Strategy goals, like offshore wind farms and 30% protected areas ● **Conflicts with MPAs:** OWF can have both positive and negative impacts on marine ecosystems. Negative impacts are reported more frequently (up to 10% of the scientific findings) being especially linked to birds, marine mammals, and ecosystem structure (Galparsoro et al., 2022). ● **Several major wind farm projects** have been developed or are in progress in the Romania's coastal zone (terrestrial part) with an installed wind capacity of 2,599 MW.

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
Examples/ Lessons learned	● Site selection often attempts to avoid sensitive habitats or migration routes, but there are no clear weighting methods for balancing biodiversity with energy production priorities. ● There is little evidence that offshore renewable energy development is coordinated with existing or planned MPA networks, risking further fragmentation of ecologically important areas. ● Wind farms, fisheries, and conservation interests often compete for the same areas, especially in shallow coastal zones.	● Wind farms and the future development 'Princess Elisabeth Zone' partially overlap with or border designated MPAs, sidelining environmental protection priorities.	● France has responded to growing biodiversity concerns by creating a national observatory on offshore wind and biodiversity, but the need for clear tools and stronger mechanisms for sector coordination remains	● OWF MSP in the Mediterranean should consider the cumulative impacts of OWF development and take a precautionary approach (through strategic and Environmental impacts assessments)	● Evaluating the environmental impacts of new OWF projects and their effects on fisheries and tourism is crucial during strategic planning at various administrative levels and through MSP. ● Bulgarian MSP plan still lacks cumulative impact assessment for the emerging sectors as OWF and offshore aquaculture development (Cornet et al., 2023).

Table 5. Identified enablers for ecosystem-based management of key economic sectors for five MSP4BIO EU Sea Basins

Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
	● **Baltic Sea Action Plan (BSAP):** The Baltic Sea Action Plan (BSAP), adopted by the HELCOM Contracting Parties in 2007 and updated in 2021, is HELCOM's strategic programme of measures and actions for achieving good environmental status of the sea, ultimately	● **The European Maritime Fisheries and Aquaculture Fund (EMFAF)** supports biodiversity goals. In Belgium, this is an important tool for the implementation of fishing regulations. Provides a six-year program which can raise the ambition of biodiversity	● **EMFAF supports biodiversity goals**, elevating ambitions toward the restoration and sustainable use of marine resources. ● **Azores have banned** bottom trawling fisheries in their entire EEZ under the CFP. ● **OSPAR–NEAFC collective arrangement** enables cross-	● **OWF MSP in the High MPA** coverage in the NW Med region (cf. D5.1). ● **Distribution of ecologically important species** like cetaceans is quite intensively studied in the region. ● **GFCM (regional RFMO)** is particularly active and effective	● **Bulgarian MSP plan and its EIA Report** provide guidance and include measures to avoid environmental impacts by maritime uses through the MSFD and WFD objectives and measures (fully integrated in the plan) ● **Support of nature conservation legislation**

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
Fishery	leading to a Baltic Sea in a healthy state. ● **HELCOM Recommendations (e.g. on sustainable fisheries):** Though not binding, these recommendations offer technical guidance for aligning national fisheries measures with ecological goals (e.g. trawling limits, spawning area protection). ● **HELCOM Working Group on Ecosystem-based Sustainable Fisheries** (Fish Group): This group focuses on integrating ecosystem considerations into fisheries management, promoting sustainable practices across the Baltic Sea region.	protection towards restoration and remediation (D.6.1) ●**Fisheries Management Measures:** Belgium is working with other MS to submit a joint recommendation in order reduce fisheries pressures in Belgian MPA. Submission foreseen beginning of 2026	sector coordination in ABNJ, linking fisheries regulation (NEAFC) with marine conservation goals (OSPAR) despite separate mandates. ● **Multiannual fisheries management plans.** These regional, legally binding plans under the CFP include mixed fisheries and environmental objectives, offering potential for ecosystem-level fisheries governance. ● **OSPAR ecological quality objectives** (EcoQOs). EcoQOs provide operational indicators (e.g., fish populations, food webs) that help monitor ecological integrity and support ecosystem-based fisheries assessment and management. ● **Spatial fisheries restrictions inside MPAs**. For instance, Belgium enforces gear restrictions and seasonal closures within some MPAs through its MSP, linking biodiversity protection directly with regulated fisheries. ● **MSFD descriptors** linking fisheries and ecosystem health. Descriptors 3, 4, and 6 under the MSFD provide a regulatory framework that connects fisheries status with broader ecosystem conditions, helping to operationalize EBM goals. ● **Stakeholder inclusion,** equity, and socioeconomic transition support: deepen co-design and participatory governance processes, ensuring fishers and local communities are part of	in engaging countries and key actors and adopting solutions to improve fisheries sustainability.	(Biodiversity Act, Protected Areas Act, Natura 2000 orders, Fishery and Aquaculture Act and orders for temporary prohibitions and restrictions which are issued. ● **National legislation and strategic/multiannual plans** for fisheries and aquaculture are harmonized with the EU legislation and with the implementation of the CFP. ● **Bulgaria's Biodiversity Strategy 2030,** approved in 2022, aims to integrate biodiversity into sectoral policies, particularly in fisheries. It aligns with the EU Biodiversity Strategy 2030 to reduce fishing's negative impact on vulnerable species and habitats, including the seabed, and seeks to improve ecological conditions. ● **Bans and restrictions**: The temporary bans in the Bulgarian Fisheries and Aquaculture Act help designate areas where beam trawling is prohibited, reducing fishing's impact on bottom ecosystems in the Black Sea. ● **Measures in the form of incentives** are also envisaged, such as in the annual determination of the conditions for catching turbot and the criteria for the assessment of applicants for an individual quota for catching turbot, an incentive-based approach is applied to the use of acoustic deterrents (pingers) as a measure to prevent bycatch of cetaceans.

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
			planning and implementation (D5.2, D5.3).		● **Co-location of maritime uses/Multi-Use in MSP:** fisheries sector benefits from positive spillover effects generated by the MPAs where fisheries resources are protected effectively ● **Synergies with other maritime uses**: i.e. between fishery and aquaculture are well recognized. Shellfish farms create habitats and food for fish, as well as reduce nutrient pollution, mitigate local climate change, and support fish populations. ● **GFCM strategy towards sustainable fisheries and aquaculture** in the Mediterranean and the Black Sea: includes ambitious targets to improve scientific knowledge and data collection on the most pressing issues facing the region's fisheries and facilitate the adoption of effective management measures.
Examples/ good practices		● Belgium plays an active role the Scheveningen Group, a coalition of EU Member States with direct fisheries management interests in the North Sea. Belgium has overseen the development of several Joint Recommendation; Belgium held the chairmanship and participated in technical expert groups Fish-ENVI. ● **The Maatschappelijk Covenant/Flemish Fisheries Trajectory (2021-2025)** was developed by a task force including fisheries representatives, scientists, a conservation NGO and the	● The integration of marine protection frameworks, such as the Azores Marine Park and Natura 2000 Network areas, and the revision under the BlueAzores project provides a strong foundation for biodiversity conservation and accomplishes the 30x30 goal. ● Cumulative Impact Assessment tools (e.g., SPIA). Tools such as SPIA were used in the Baltic Sea to identify overlapping pressures from fisheries and other sectors, supporting spatial decisions grounded in ecosystem vulnerability.	● Pelagos Sanctuary: Transboundary MPA that could enhance cooperation among neighbouring countries and different stakeholders. ● Participatory mapping tool as a Decision support tool (DST). ● Reflection and approaches on different management solutions (site-based measures, sector-based measures, mitigation measures, …) can be shared and considered in any maritime area. ● The methodology developed to answer management needs is replicable to other sites.	● During the trade-offs exercise, which included Participatory Mapping Survey utilizing SeaSketch, Bulgarian CoP members recognized that the fisheries sector has synergies with coastal and maritime tourism as well as with MPAs. ● Cumulative Effect Assessment (CEA) of PW4B DST - see D5.3 for the Black Sea applications and proposed solutions ● Objective 2.4 of Bulgarian MSP Plan focuses on sustainable development in fisheries and aquaculture, supported by the CFP. Implement efficient fisheries management to combat

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
		government and provides a strategy for shifting to a sustainable fishery sector (D6.1).	• Climate-smart and spatially adaptive planning tools: support adaptive management frameworks that integrate climate change scenarios into fisheries and MSP (D5.1, D6.2). • The OSPAR–NEAFC Collective Arrangement is a voluntary framework linking OSPAR's marine conservation efforts with NEAFC's fisheries management in the North-East Atlantic's ABNJ. It aims to align conservation and fisheries objectives in ecologically sensitive offshore areas affected by bottom fishing. While lacking enforcement power, it facilitates dialogue, information sharing, and joint standards.	• Methods to evaluate ecological features distribution (such as VMEs) can be capitalized and reused elsewhere. • Site-based measures (e.g. preventing life-cycle essential habitats; identification of functional areas for cetaceans' populations) • Sector-based measures (permanent fishing closures in specific areas for conservation of VMEs) for implementation in larger areas • Mitigation measures (traffic deviation, speed limitation, …)	overfishing, protect marine mammals and seabirds, and preserve local livelihoods. • Enhancing collaboration among all stakeholders involved in the fisheries and aquaculture sector, with Fisheries Local Action Groups (FLAGs) serving as cross-sectoral clusters. • Sf. Gheorghe - Sahalin, on the North-Western Black Sea shelf, was identified as an area suitable for closure of fisheries - beneficial both nature conservation and the livelihood of local coastal communities, established as the first national Fisheries Restricted Area (nFRA) in Romania.
Aquaculture	• **HELCOM Working Group on Reduction of Pressures** from Sea-based Sources (Pressure Group): This group addresses environmental impacts from aquaculture, among other sea-based activities, aiming to reduce nutrient inputs and other pressures. • **Baltic Sea Regional Aquaculture Dialogue**: A platform facilitating discussions among stakeholders to promote sustainable aquaculture practices in the region. • **HELCOM HOLAS** (Holistic Assessments) Provides region-wide ecosystem condition data, including pressures from aquaculture. These data feed into planning and impact assessments	• **Investment in nature Development:** There is a general willingness of different sectors to contribute and invest in nature development. In Annex 2 of the MSP, it is mentioned that certain activities could contribute to ecological value (Nature Inclusive Design) and potentially benefit nature protection implicitly, such as aquaculture projects that reduce eutrophication or wind farms that prevent soil disturbing activities in the area or provide artificial reefs. (Source: FOD, 2020; D5.1) • **Designated aquaculture areas:** specific zones for sustainable aquaculture development are integrated in the MSP 2026-2034. This plan promotes the co-location of aquaculture with other marine	• **EIA requirements in most OSPAR countries**. In countries like Ireland, Norway, and Scotland, aquaculture operations are subject to EIA, which assess site-specific ecosystem risks such as eutrophication or benthic impacts. These regulatory frameworks embed ecological risk screening into the licensing process. • **Benthic and water quality monitoring requirements.** Several countries (e.g., France, Ireland, Norway) mandate routine monitoring of benthic conditions (e.g., Infaunal Quality Index, sulfide levels) and water quality near farms. This enables adaptive management based on ecosystem feedback. • **Research and data initiatives like EMODnet and AquaSpace:** provide spatial tools and	• **Allocated Zones for Aquaculture (AZAs)** are designated areas within MSP that identify suitable sites for aquaculture while minimizing conflicts with other marine activities like tourism, MPAs, SSF, and maritime routes • **In the context of spatial planning, GFCM is working** towards updating the toolbox for AZA towards defining Aquaculture Management Areas (AMSs) and establishing relevant guidelines and action plans. • **Mediterranean countries** are working towards restorative aquaculture that integrates food production with active efforts to restore and enhance marine and coastal ecosystems	• **Specific policies and guidelines** for aquaculture development should be integrated in MSP, including also cross-sectoral policies and guidance on how aquaculture can: (i) avoid spatial conflicts with other activities and (ii) how synergies and co-location opportunities can be maximized (e.g., involving FLAGs that support both aquaculture and fisheries). • **Bulgarian MSP Plan Specific objective 2.4** provides recommendations for sustainable aquaculture development and removing abandoned aquaculture facilities against plastic debris. • **Multiannual National Strategic Plan for Aquaculture in Bulgaria** (2021-2027), aiming to: 1) promote environmentally sustainable aquaculture practices for efficient

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
		activities, such as offshore wind energy, to optimize space usage and minimize conflicts. By integrating aquaculture into MSP, Belgium ensures that aquaculture development aligns with broader marine ecosystem objectives. Source: ● **National Strategic Plan for Aquaculture (2021–2030):** The Belgian National Strategic Plan for Aquaculture outlines a vision for environmentally and economically sustainable aquaculture. It emphasizes the importance of integrating aquaculture within the marine ecosystem and encourages projects that combine environmental objectives with food production. This strategic plan serves as a roadmap for developing aquaculture in harmony with ecosystem-based principles. (Source: European Commission, 2023) ● **Ecosystem services and Multi-Trophic Aquaculture:** Belgium is exploring aquaculture techniques that provide regulatory and protective ecosystem services. For instance, multi-trophic aquaculture systems, which combine species like mussels, oysters, and algae, can enhance biodiversity and water quality. These systems contribute to the European Biodiversity Strategy by supporting ecosystem functions while producing	environmental data to support site selection, cumulative pressure assessment, and stakeholder engagement in aquaculture planning. ● **Regional Action Plans** under OSPAR for marine litter from aquaculture. OSPAR has adopted measures to reduce marine litter originating from aquaculture (e.g., plastic nets, ropes), including actions on gear marking, recovery schemes, and better reporting. ● **Cross-border collaboration** through Regional Seas Conventions and EU projects. OSPAR, INTERREG, and Horizon Europe projects (e.g. BlueShell, AquaVitae, MSP4BIO) promote cross-border learning and governance harmonization across aquaculture practices and monitoring.	● **The GFCM promotes** rigorous environmental monitoring for aquaculture to reduce impacts, enhance efficiency, ensure product safety, and maximize social benefits. ● Interconnection with the fishery sector: progress can be made about the provenance of food for aquaculture and the promotion of more sustainable practices.	water use; 2) boost demand for locally sourced, sustainably produced aquaculture products. ● **Strengthening dialogue/coordination** between competent MSP and aquaculture authorities is needed. ● **Most fish and shellfish species cultivated in the Black Sea** possess the potential for incorporation into an Integrated Multi-Trophic Aquaculture (IMTA) system. ● **A collaborative governance strategy** that integrates aquaculture zoning would promote sustainable growth in the Black Sea, as endorsed by the FAO-GFCM Strategy for the Mediterranean and Black Sea (Massa et al., 2021), created through extensive stakeholder engagement. ● **A data- and science-driven strategy is essential** for sustainable aquaculture in the Black Sea, especially in regions lacking innovative technology. This includes IMTA, recirculating aquaculture systems (RAS), and offshore aquaculture (Massa et al., 2021). ● **Settlement of legislative framework:** microbiological classification and water concession.

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
		seafood. (Source: European Commission, 2023)			
Examples/ good practices	• Limitation of the development of sea-based fish farming due to nutrient load reduction targets HELCOM Recommendation 42-43-10 on sustainable aquaculture and respective BAT/BEP Pollution Load Compilations (PLC projects, currently PLC-9) includes assessment of nutrient load from land and sea-based aquaculture separately as part of tracking the implementation of the regional nutrient input reduction scheme	•Pioneering research project that integrates multi-trophic aquaculture, specifically mussels, flat oysters, and seaweed, within an operational offshore wind farm to create balanced ecosystem. This project exemplifies a multi-use approach to marine space, aiming to harmonize sustainable food production with renewable energy generation and marine ecosystem restoration. (ULTFARMS)	• Norway's traffic light system for environmental regulation. Norway uses a traffic light model to regulate aquaculture expansion by dividing the coast into zones, colour-coded based on environmental indicators like sea lice impact on wild salmon. Areas with high environmental risk are frozen or scaled down. • Use of IMTA in research and pilot projects. Tested in parts of France, Portugal, and the UK. These systems reduce nutrient loading and mimic ecological processes by combining species like fish, shellfish, and algae.	• Resolution GFCM/36/2012/1 gives guidelines on allocated zones for aquaculture (AZA), making them a priority to responsibly develop, manage and transform the sector. • Technical support for the establishment of AZAs in the Mediterranean is being provided to countries by GFCM, with specific actions carried out in Albania, Lebanon, Morocco and Tunisia • Practical knowledge tools to facilitate the understanding and use of AZAs across the Mediterranean have been created and presented in the form of "AZA toolkit". • The first Mediterranean Restorative Aquaculture Centre will be open in La Rapita, Catalonia, Spain, focusing on innovations and capacity-building.	• Marine aquaculture and conservation efforts can align by setting up aquaculture facilities within MPAs. This approach can enhance coastal tourism and fishing, as shellfish farms provide habitats and nourishment for fish. • Aquaculture draws scuba diving enthusiasts and boosts local restaurants offering products like black mussels, benefiting the economy and promoting sustainable marine resource use. Notably, the mussel farms in the Dalboka area along Bulgaria's northern coast exemplify this. •The GFCM has adopted Resolution GFCM/36/2012/1 to improve aquaculture management in the Mediterranean and Black Sea. This AZA framework serves as a key planning tool to enhance aquaculture governance, aligning with ecosystem approach to aquaculture (EAA), ICZM and MSP, Massa et al., (2021).
Tourism	• **Baltic Sea Tourism Center (BSTC)**: An organization that promotes sustainable tourism development in the Baltic Sea region, providing a platform for cooperation among tourism stakeholders.	• **Integration into MSP:** Explicitly integrates tourism and recreation into spatial planning. Ensures zoning for activities (e.g., recreation zones, protected areas), balancing tourism with conservation and other uses (shipping, fisheries, renewables). Promotes co-existence strategies to mitigate conflicts between tourism and marine biodiversity.	• **Ecotourism/Nature-based tourism**: Well-managed ecotourism raises environmental awareness, generates funding for conservation, and enhances local stewardship. • **Climate change patterns and adaptive management**. Anticipating climate-driven changes to marine ecosystems and tourism patterns enables forward-looking and resilient EBM strategies.	• **Eco-Tourism and Low-Impact Activities:** Controlled nature-based tourism, such as guided snorkeling, wildlife watching, and kayaking, fosters environmental awareness while reducing ecosystem disturbance. • **Sustainable Tourism Certifications:** Promoting eco-labels encourages responsible tourism practices that minimize environmental impact.	• **Nature-based and eco-tourism:** urbanization is driving the rising demand for nature-based tourism. Sustainable activities like coastal walks, birdwatching, and scuba diving attract a new wave of local and international travelers to the Black Sea region. • **Multi-use opportunities:** Synergies may emerge through alternative activities, including eco-tourism and MPAs, i. e. a MU

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
		• **Sustainable tourism initiatives:** Eco-tourism initiatives are promoted within MPAs and Natura 2000 sites to align tourism with conservation. (Source: FPS Health, Food Chain Safety and Environment, 2020) • **Coastal Zone Management**: Supports sustainable tourism through coastal defense projects, beach nourishment, and dune protection. Integrates tourism with ecosystem resilience initiatives (e.g., "Coastal Safety Master Plan") • **Adoption of Strategic Policy Plan for Tourism and Recreation Coast 2024-2030** (Source: Departement Mobiliteit & openbare werken – Vlaanderen, n.d.)	• **Clear rules and monitoring.** Transparent regulation of tourism activities, combined with ecological monitoring and clear zoning, supports compliance and adaptation.	• **Well defined visitor regulations within MPAs:** Implementing visitor regulations in line with carrying capacity limits, zoning strategies (e.g., no-anchor zones in Posidonia seagrass beds) and other regulations that help balance tourism and conservation. • **Stakeholder Engagement and Community Involvement**: Local communities and some traditional sector groups, like small-scale fishers, participate in sustainable tourism (e.g., pesca-tourism in Italy and Spain) to create economic incentives for conservation. • **Innovative Mooring Systems**: Installing eco-friendly mooring buoys in yachting hotspots (e.g., Croatia, France, Greece) prevents anchor damage to sensitive marine habitats like Posidonia meadows. • **Introduction of specific legislation** to protect seagrass ecosystems is proving to be particularly effective (i.e. French 24m Yachts anchoring ban on seagrass, Posidonia Law in the Balearic Islands). • **Waste Management and Pollution Control:** Implementing strict waste disposal regulations for cruise ships, marinas, and beach resorts helps reduce marine litter and sewage discharge. • **Education and Awareness Campaigns**: Visitor education	between tourism, UCH and environment (case study elaborated in MARSPLAN-BS II project). The presence of UCH also protects the marine environment from other uses disturbing the seabed (e.g. trawling) (Stancheva et al., 2022). • **Waste management**: a strategy is needed to assist coastal local authorities to improve waste management (including beach litter), by limiting different sources of waste and its input in the sea. • **MSP as a key tool for sustainable tourism**: coastal and maritime tourism relies heavily on environmental quality and seawater conditions, as well as the balance between human and ecological uses of maritime spaces. Thus, MSP is essential for promoting growth and sustainability in the Black Sea tourism sector. • **Measures for tourism restrictions in MPAs**: this includes regulating tourism development and addressing environmental issues. To improve tourism capacity, management strategies should monitor visitation and limit visitor usage, ensuring marine preservation, visitor satisfaction, and adequate facilities.

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
				programs promote responsible marine tourism behavior.	
Examples/ good practices	●Cross-sectorial dialogue supported by respective Policy Areas within the EUSBSR Consideration of cultural aspects of EBA in the draft Revised EBA Guideline which includes integration of cultural ecosystem service term.	● Zwin: a protected coastal area where visitors are limited and channelled through designated paths to avoid disturbing birds and plants. ● Westtoer, the tourism agency for West Flanders, actively promotes sustainable tourism along the Belgian coast through a dedicated strategy focused on nature, heritage, and local experiences. It develops eco-friendly infrastructure like the Coast Cycling Network, encourages businesses to adopt sustainability certifications such as the Green Key label by offering financial support, and monitors tourism trends to inform policy.	● Azores Test Site (Graciosa Island): Integrated responsible tourism with conservation through participatory planning and trade-off analysis, identifying areas where marine tourism can coexist with high biodiversity value (D5.3). ● Initiatives like the “Blue Business Incubator” and “MEET” link tourism to conservation and blue finance, promoting revenue streams reliant on healthy marine environments (D4.2). ● Graciosa CoP brought together tourism operators, planners, fishers, and NGOs to co-validate planning solutions and prioritize conservation areas, creating shared understanding and actionable agreements (D5.3) ● Co-locating tourism and small-scale fisheries in sustainable “experience-based” models (fishing-tourism) promotes cultural value and reduces sectoral conflict (D4.2).	● The Pelagos Sanctuary for Mediterranean Marine Mammals has established a dedicated code of conduct for whale watching activities, aimed at reducing acoustic disturbances and preventing fuel discharges to safeguard the marine mammals it protects. ● Designation of the North-Western Mediterranean Sea as a Particularly Sensitive Sea Area (PSSA). ● The Marine Environment Protection Committee (MEPC 79) of the International Maritime organization (IMO) adopted amendments to designate the Mediterranean Sea, as a whole, as an Emission Control Area for Sulphur Oxides and Particulate Matter, under MARPOL Annex VI. ● Policy brief and recommendations for leisure boats, tour boats and cruise sectors within MPAs, as part of Pharos4MPAs project. ● As part of the WestMED initiative, new technical group for Sustainable Tourism has been established in July 2024. The group aims to provide a technical forum to discuss regional sustainable tourism trends and help participants develop projects on EU priorities like green transition,	● The extended network of MPAs can potentially boost the value of tourism-related businesses, particularly those reliant on UCH activities like scuba-diving, as they attract more visitors and create opportunities to overcome the trade-offs and to develop multi-use combinations. ● UCH benefits from conservation efforts in protected areas, while tourism gains economically from both sectors. UCH sites provide refuge for vulnerable marine species affected by fishing and habitat disruption. Bulgarian stakeholders see this approach as an opportunity to shift from mere protection to true valorization of UCH and MPA resources, enhancing monitoring and protection efforts (Stancheva et al., 2022). ● The application of the circular economy principles is embedded in the Bulgarian MSP plan. This can be facilitated by developing and providing access to innovative financial instruments and funding for eco-innovation. ● National Strategy for Sustainable Development of Tourism in Bulgaria (2014–2030) is a key document in the MSP plan, highlighting priorities for coastal and maritime tourism. It aims to tackle overdevelopment, preserve the coastal landscape, and

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
				digitalization, social inclusion, governance, and skills. ● French anchoring ban on Posidonia for boats larger than 24m ● Balearic Islands Posidonia Law	promote sustainable tourism practices.
Marine non-living resources extraction	● **HELCOM Working Group** on Reduction of Pressures from Sea-based Sources (Pressure Group): This group addresses environmental impacts from sea-based activities, and other pressures. HELCOM expert group on dredging depositing operations at sea.	● **MSP - Designated extraction, and monitoring zones**: The Maritime Spatial Plan delineates specific zones for sand and gravel extraction. Limits on extraction volumes have been set, and Environmental Impact Assessment (EIA) and continuous monitoring are required.	● **Strategic environmental assessment (SEA**) of extraction zones. Many countries require SEAs or similar evaluations at a regional level before issuing extraction licenses. ● **Centralized data collection and mapping tools** (e.g., EMODnet). Use of platforms like EMODnet Human Activities and ICES WGEXT databases improves data transparency and spatial analysis. ● **Precautionary exclusion of sensitive habitats**. ICES recommends avoiding high-value benthic habitats (e.g., Sabellaria reefs, maerl beds). ● **Forward-looking demand modelling and scenario planning.** Countries like the UK and the Netherlands use scenario-based planning to forecast future demand and identify ecological limits.	● **Strategic environmental assessment** (SEA) of extraction zones. Many countries require SEAs or similar evaluations at a regional level before issuing extraction licenses. ● **Centralized data collection and mapping tools** (e.g., EMODnet). Use of platforms like EMODnet Human Activities and ICES WGEXT databases improves data transparency and spatial analysis.	● **Convention on Environmental Impact Assessment in a Transboundary Conte**xt (Espoo Convention) governs transboundary environmental impact assessments (EIA) and applies to projects in the Black Sea region, ensuring that environmental risks are evaluated before development begins ● **Black Sea Commission Initiatives**: Includes protocols for pollution control and marine environmental protection
Examples/ good practices	HELCOM Guidelines for management of dredged material at sea (2024)	● Coastal protection**:** Dredged sand is more and more employed for beach nourishment and dune reinforcement, enhancing the resilience of the Belgian coastline against sea-level rise and storm surges (Source: Economie, 2024)	● Adoption of ICES Guidelines on Marine Aggregate Extraction. The 2003 ICES Guidelines (endorsed by OSPAR via Agreement 2003-15) promote site-specific assessment, avoidance of sensitive habitats, limits on extraction depth/extent, and adaptive management.	● Efforts made to promote more eco-friendly practices for salt extraction (Camargue, France - Tunisia) and enhance eco-tourism, better integration with the local Natura 2000 and Ramsar sites for impact reduction and monitoring. Mandatory monitoring of impacts	● Romania and Bulgaria have collaborated on environmental impact assessments (EIA) under the Espoo Convention, which governs transboundary environmental impacts for Neptun Deep gas field. This cooperation ensures that offshore energy projects, including hydrocarbon

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
		● ICES Guidelines on Marine Aggregate Extraction. The 2003 ICES Guidelines (endorsed by OSPAR via Agreement 2003-15) promote site-specific assessment, avoidance of sensitive habitats, limits on extraction depth/extent, and adaptive management. Belgium has integrated these guidelines into its marine sediment extraction policies		for desalination, multiplication of sectorial "good practices" guides (e.g. UNEPMAP – Guidelines on Desalination and Brine Management) • Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil.	extraction and renewable energy development, comply with international environmental standards.
Renewables	● **HELCOM-VASAB MSP Working Group:** Critical for integrating renewable energy development with biodiversity protection across countries. Includes cross-border coordination and data integration for offshore wind planning ● **Baltic InteGrid Project**: An initiative aimed at promoting the development of an integrated offshore grid in the Baltic Sea, facilitating the expansion of offshore wind energy while considering environmental impacts.	● **Adapted MSP for 2026:** The Marine Spatial Plan for Belgium is currently being finalized after a thorough review process (+ stakeholder consultation) where all activities were re-assessed including conservation, renewable energy and other human activity priorities. ● **Environmental Permitting with Integrated Monitoring** Environmental permits for offshore wind farms in Belgium are contingent upon comprehensive ecological monitoring. (Source: Degraer et al., 2024) ● **Long-term data support:** Belgium now has the longest time series of data on the environmental impact of offshore wind farms in the world (Source: Degraer et al., 2021)	● **Nature-inclusive design and habitat restoration.** Wind turbines and infrastructure can be designed to enhance biodiversity — from artificial reefs to mobile species corridors. ● **Ongoing monitoring of impacts** (e.g., underwater noise, seabird collisions) is essential for adaptive management and transparency.	● **Regulatory frameworks**: Many Mediterranean countries are now working on marine spatial planning and regulations specifically tailored to offshore wind (Italy, France and Spain in particular). ● **Political support and funding**: National and EU-level support (like through the Green Deal or Recovery and Resilience Facility) can accelerate development. ● **Floating turbines could potentially reduce** environmental and social impacts as they can be placed farther from the coast, reducing visual impact and minimizing conflicts with tourism, fishing, and marine biodiversity. ● **More site availability**: with floating tech, more potential sites open up, especially in countries like Italy, France, Greece, and Spain, where the continental shelf drops off quickly.	● **Potential for OWF development**: presence of a wide and shallow shelf in front of the Bulgarian Black Sea coast. It is necessary to find a balance between natural resources and the economic benefits of construction of windfarms. ● **Legislation and regulatory framework:** In progress for Bulgaria and the Offshore Wind Roadmap for Romania outline the development of a new offshore wind industry. The plan estimates that Romania could install up to 7 GW of offshore wind capacity within its EEZ by 2035 ● **Allocation of zones in the Bulgarian MSP plan:** the plan includes designated areas for potential future use, which may be allocated for offshore wind farm developments should there be interest from investors. ● **The MSP4BIO DSTs for cumulative effect assessment** assist in analyzing and evaluating the impacts of emerging offshore

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Economic sector	Baltic Sea	North Sea	Atlantic	Mediterranean Sea	Black Sea
					wind farm activities on marine ecosystems.
Examples/ good practices		● In the MSP 2026-2034, no new zones were designated, as studies showed that any expansion would come at significant environmental and user costs. Only existing and already designated zones will be maintained. ● The WinMon.BE program, coordinated by the Institute of Natural Sciences, mandates long-term assessments of impacts on seabirds, marine mammals, benthic habitats, and fish communities. This monitoring is integral to the permitting process and informs adaptive management strategies. ● ULTFARMS project exemplifies a multi-use approach to marine space, aiming to harmonize sustainable food production with renewable energy generation and marine ecosystem restoration. ● The Common Environmental Assessment Framework (CEAF) is an international initiative involving Belgium and other North Sea countries aimed at identifying and assessing the ecological effects of offshore wind farms (Source: Noordzeeloket UK, 2025)	● Offshore wind farms can act as artificial reefs, enhancing biodiversity when co-located with MPAs or aquaculture operations. This has been documented in European test sites and promoted as good practice in D4.2 and D2.3.	● Stakeholder consultation: France's national independent authority for the implementation of stakeholder consultation processes (national debates, workshops, meetings) regarding ORE development in all sea basins (Commission Nationale du Débat Public).	● Trade-off exercise in Bulgarian Black Sea test site, and extension of MPAs: OWF sector is emerging, especially at the test site, which shows great potential. Participants stressed that prioritizing OWF development is crucial for boosting green energy in line with the EGD. On the other hand there were concerns about its impact on conservation, particularly MPAs and bird migration. ●Black Sea test site CEA application with scenarios for OWF developments for mobile species (D5.3). ● Offshore Wind Development Program (Offshore Wind Roadmap for Romania) (World Bank Document).

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6 Key policy coherence considerations for results upscaling feeding into regional strategies – European, national and regional level

North Sea

Effective EBM in the Belgian part of the North Sea relies not only on national and EU-level action but increasingly on how these policies can contribute to regional strategies. As marine ecosystems and pressures go beyond borders, coherence with frameworks like the *OSPAR Convention* and *the Greater North Sea Basin Initiative (GNSBI)* becomes crucial.

One national initiative with potential to feed into regional strategies is the ***Maatschappelijk Covenant/Flemish Fisheries Trajectory (2021–2025).*** This agreement includes seven measures to keep fish stocks at healthy levels and fosters a participatory approach to fisheries governance. Belgium should aim toward renewing this initiative beyond 2025 and take the opportunity to better align the agreement with regional conservation priorities, particularly within the framework of *OSPAR's* ***North-East Atlantic Environment Strategy 2030*** **(NEAES 2030).** By coordinating sustainable fisheries efforts with regional objectives to restore ecosystem health, Belgium can not only improve fish stock management, but also MPA effectiveness.

Moreover, the adoption of the *EU Nature Restoration Law* in 2024 marks a promising step in conservation policy. With legally binding targets for restoring degraded ecosystems in all EU Member States, the law provided a foundation to align national implementation plans on regional level. Belgium's national restoration plan, due by June 2026, should keep regional cooperation in mind and integrate marine restoration targets into initiatives such as the *GNSBI*, which supports transboundary collaboration on marine spatial planning (MSP) and biodiversity. However, up until today national implementation processes remained mostly in the respective countries.

Although Belgium may focus on national targets in some things, it also acts on regional level by engaging for example in the *OSPAR Regional Strategies*, which guide the designation and management of MPAs. Belgium's national policies such as the revised MSP and the Nature Restoration Law should aim to reflect OSPAR's ecological targets, especially in setting thresholds for ecosystem conditions and impact.

The CFP poses an urgent need for improved regional collaboration since fishing areas are frequented by multiple Member States. In the past, enforcing *CFP* measures has been challenging due to the difficulty of monitoring vessels from multiple countries at sea. Moreover, regionally coordinated proposals for fisheries measures were declined by the European Commission, making it hard to successfully implement regulation. Still, Belgium could support regional efforts by scaling up successful practices under the Flemish Fisheries Trajectory, aligning local sustainability efforts with regional conservation goals.

Belgium has several strong national and EU-level policies that can support EBM, but their real impact depends on how well they are put into force and align with regional strategies. Initiatives like the *Flemish Fisheries Trajectory* and *the Nature Restoration Law* offer great potential to feed into broader efforts under *OSPAR* and *GNSBI*. Strengthening these connections can help to ensure local efforts contribute to healthier ecosystems across the region.

Baltic Sea

There are several EBA focused policies in the Baltic Sea area across European, national, and regional levels**. At the European level,** several high-level strategies and legal frameworks shape the regional policy landscape. The EU Biodiversity Strategy for 2030 sets clear targets, such as 30% marine protection and 10% strict protection − providing a shared direction for national and regional planning. It works in tandem with the MSFD, which mandates Good Environmental Status (GES) and supports the integration of biodiversity concerns into all marine-related policies. The MSP Directive further ensures that environmental considerations are embedded in MSP, balancing ecological, economic, and social objectives. Additional instruments such as the CFP, the EGD and funding mechanisms like EMFAF promote sustainable resource use and biodiversity integration. Global commitments, such as those stemming from the Convention on Biological Diversity, the EU Restoration Law, the Ocean Pact, and the EU Habitats and Birds Directives, reinforce the need for marine ecosystem protection, offering legal and political momentum for coherence between conservation goals and sectoral development.

At the national level, countries translate these frameworks into practice through their MSP plans, often reflecting HELCOM targets like the 30% protection goal. Inter-ministerial coordination mechanisms support policy alignment across sectors, such as fisheries, environment, and infrastructure, ensuring that biodiversity objectives are not sidelined in planning processes. Many countries, including Germany and Sweden, have updated their biodiversity and MPA strategies, incorporating tools like cumulative impact assessments to meet EU and regional targets.

On the regional level, cooperation is anchored through platforms like the HELCOM-VASAB MSP Working Group and the HELCOM BIODIV Group, which foster cross-country coordination and alignment between MSP and biodiversity strategies. The Baltic Sea Action Plan (BSAP) and the HELCOM-VASAB MSP Roadmap 2030 establish shared goals and a joint trajectory for achieving GES and coherent spatial planning. Tools like the HOLAS assessments and HELCOM's monitoring systems provide a common environmental knowledge base, supporting harmonized, adaptive management. Moreover, regional EBA guidance and the legal framework provided by the Helsinki Convention ensure that the Baltic Sea countries pursue an integrated, ecosystem-based approach rooted in shared environmental responsibility.

Atlantic Ocean

At the European level, strategies and guidance such as the EU Atlantic Action Plan 2.0 and the Guidelines for Implementing an Ecosystem-Based Approach in Maritime Spatial Planning provide frameworks to support cross-country cooperation and the integration of EBA into MSP.

At the regional level, OSPAR initiatives help advance EBM-compatible policy implementation. The North-East Atlantic Environment Strategy 2030, the Joint OSPAR–NEAFC Collective Arrangement, and the OSPAR Quality Status Report 2023 promote marine biodiversity protection, cross-sectoral governance in ABNJ (notably between fisheries and conservation), and scientific assessments of the marine environment, respectively. Additional regional tools include the OSPAR MPA network, data platforms, and thematic strategies.

At the national level, the joint transposition of the MSPD and MSFD, as seen in France's MSP, could be a good practice linking ocean sustainability and MSP. Cross-ministerial collaboration between fisheries and environmental authorities − for example, in France and Spain − has proven effective in coordinating MPA designation and fisheries regulation in ecologically sensitive areas such as the Bay of Biscay.

Achieving effective EBM in the North-East Atlantic requires moving beyond fragmented governance and short-term economic priorities, building on these existing enablers and scaling up successful practices.

Mediterranean Sea

Different EU initiatives supporting policy coherence between blue economy sectors and ecosystem management include: **The WestMED Initiative**, launched in 2017, builds on years of collaboration between ten Western Mediterranean countries − five EU Member States (France, Italy, Portugal, Spain, Malta) and five Southern partner countries (Algeria, Libya, Mauritania, Morocco, Tunisia). With their efforts to strengthen maritime safety and security, promote sustainable blue growth and jobs, and safeguard ecosystems and biodiversity, the initiative aims for a healthier, safer, and more resilient maritime space. It also aims to advance a smarter Blue Economy and strengthen maritime governance in the region. The initiative is supported by the European Commission.

The MED-MSP-CoP is a voluntary network of MSP experts from EU and non-EU Mediterranean countries, established in January 2023 by CINEA and DG MARE under the WestMED Initiative, with support from the EU MSP Assistance Mechanism. By building on diverse projects and sharing technical expertise, the CoP fosters policy coherence and consistency in MSP development and implementation. It focuses on two main areas: enhancing and connecting MPAs and OECMs within MSP, and advancing MSP as a driver of national Sustainable Blue Economy strategies. To support this, the

CoP has set up four working groups on aquaculture, fisheries, offshore wind energy, and nature protection.

The EU Strategy for the Adriatic and Ionian Region (EUSAIR), endorsed by the European Council in 2014, is a macro-regional strategy structured around five pillars: Sustainable Blue Economy, Connecting the Region, Environmental Quality, Sustainable Tourism, and Social Cohesion. The Environmental Quality pillar promotes actions to protect marine, coastal, and terrestrial biodiversity, with a strong focus on cross-border and transnational cooperation in ICZM and MSP. Key goals include better management of coastal and marine biodiversity and stronger coordination through MSP and ICZM. Aligned with global targets, EUSAIR aims to effectively conserve and manage at least 30% of the region's coastal and marine areas by 2030. Its governance involves a governing board, thematic steering groups, and a dedicated facility point.

Translating and implementing European policies and directives at the national level remains challenging, requiring genuine alignment between supranational objectives and the plans and strategies developed by each MS. There are, however, examples of cooperation among Member States to advance biodiversity conservation efforts and to ensure coherence between conservation guidelines and marine spatial planning initiatives:

MPA planning in France and Italy reflects ongoing efforts to reconcile biodiversity conservation with economic development through inter-ministerial coordination and cross-border cooperation. The Pelagos Sanctuary for Mediterranean Marine Mammals stands out as an example of this collaboration. This transboundary MPA, jointly established by France, Italy and Principality of Monaco, is governed through coordination between various national ministries responsible for the environment, maritime affairs, fisheries, and other relevant sectors. The Sanctuary represents a commitment to policy coherence between marine conservation, maritime spatial planning, and socio-economic activities such as shipping, fisheries, and tourism. However, operationalising this coherence remains challenging, as sectoral priorities and institutional competences are often fragmented at national level.

France's National Strategy for the Sea and the Coast (*Stratégie Nationale pour la Mer et le Littoral – SNML*) incorporates climate adaptation into MSP, with references to ecosystem-based adaptation (EbA), carbon sequestration, and biodiversity protection. The strategy promotes the integration of blue carbon ecosystems, such as seagrass meadows and saltmarshes, as natural climate solutions within MSP processes. By linking climate objectives with marine conservation and spatial planning, the SNML contributes to the implementation of the EU Biodiversity Strategy and supports France's broader commitments under the European Green Deal.

Achieving effective ecosystem-based management on the regional level requires strong policy coherence across marine and coastal governance frameworks. Under the **Barcelona Convention**, several key instruments and initiatives work together to align regional efforts toward sustainability, biodiversity conservation, and climate resilience. The **ICZM Protocol** and the **Conceptual Framework for Implementing MSP in the Mediterranean**, supported by the **MSP Working Group** established under COP Decision

26/10, provide a harmonized approach to spatial planning along the land-sea continuum. These tools ensure that coastal development, marine uses, and conservation are coordinated and ecosystem-based.

Furthermore, the ongoing update of the **Mediterranean Strategy for Sustainable Developmen**t (2026–2035) and the upcoming revision of the **Regional Climate Change Adaptation Framework** reflect a growing commitment to integrated, forward-looking policy responses. Together, these frameworks promote synergies among environmental, socio-economic, and climate goals − key to building the resilience of Mediterranean ecosystems and communities.

Joint MPA monitoring − through platforms like the MedPAN network − enhances data sharing and coordinated scientific research, reinforcing coherence across local and regional scales.

Black Sea

At the European level several high-level strategies and legal frameworks coordinate and guide the regional policy landscape. The **MSPD (Directive 2014/89/EU)** is the key policy agenda, implemented at Bulgaria and Romania as the EU MS, involving also other non-EU Black Sea countries in different formats. Their MSP plans are approved and are being now in the implementation phase. The two EMFAF projects MARSPLAN-BS I and II supported the cross-border collaboration and the implementation of the MSPD. EGD implementation has been facilitated by greater coherence of MSP plans among Bulgaria and Romania, trying to involve also the non-EU Black Sea countries. Plans ought to aim for not only functional coherence in relation to the EGD objectives but also strategic coherence concerning their broader goals and visions. This can be accomplished by leveraging existing frameworks, including the EU Member State Expert Group on MSP, or sea basin convention and regional frameworks. The EU Biodiversity Strategy 2030 highlights key factors for conserving and restoring Black Sea biodiversity in MSP. These include establishing a unified network of MPAs to protect 30% of marine areas, with 10% under strict protection, promoting multi-use opportunities that align biodiversity conservation with maritime activities, and advancing coordinated transboundary efforts to improve conservation outcomes.

At the national level: biodiversity and ecosystem are prominently emphasized in the MSP Plan's goals and scenarios as overarching and cross-cutting priorities, aligned with the implementation of the MSFD for achieving Good Environmental Status, WFD for attaining Good Surface Water Status, and national environmental legislation. The Bulgarian MSP Plan is underpinned by Environmental Assessment (EIA) and a document issued by the Ministry of Environment and Water (MOEW) outlining additional measures to meet the objectives of the EU Biodiversity Strategy 2030. The Plan incorporates all existing MPAs (both nationally designated and Natura 2000), does not propose new or expanded MPAs, but supports achieving the Biodiversity Strategy 2030 targets furthering development of the MPAs network.

At the regional level: the substantial differences in the policy and governance frameworks between the EU and the non-EU Black Sea countries are recognized as a critical barrier for achieving a common approach to upscaling results for an EBA in the MSP. The key EBA-MSP challenges include gaps and overlaps between strategies, policies, and economic objectives. Significant challenge is also the great difference in the policy and governance framework characterizing the Black Sea countries, as the non-EU countries follow mostly regional and their national strategies.

The Convention on the Protection of the Black Sea Against Pollution (1992) plays a crucial role in biodiversity and ecosystem protection, coherent MPAs regional network and promoting sustainable blue economies, especially by encouraging stakeholder participation. The Black Sea test site CoP advised that a unified strategy, enhanced cross-border collaboration, and the establishment of suitable implementation mechanisms are crucial. The two EMFAF Black Sea projects (MARSPLAN-BS I and II) provided numerous contributions and insights by facilitating transboundary MSP and the coherence of MPAs, while also engaging the non-EU countries bordering the Black Sea. The EMFAF MSP-GREEN project and the results for the Black Sea Basin (Bulgarian case) supports the integration of the EGD objectives in MSP in particular biodiversity protection at regional sea basin level.

The Common Maritime Agenda for the Black Sea signed by all Black Sea countries in 2019, is guiding the main priorities towards sustainable Blue Economy of the basin, including improved ecosystem services and management, as well as blue research and innovations, investments, capacity building and jobs creation.

- Promoting transboundary collaboration could be achieved by increasing funding opportunities and strengthening cooperation mechanisms. Nevertheless, the challenging geopolitical climate is presently hindering the potential for comprehensive collaboration at the regional level. The CoP members also deemed that a more robust integration between MSP and MSFD through a common regional approach is significant for EBA-based MSP.

The future EU-Black Sea cooperation will focus on three main pillars: 1. Enhancing security, stability, and resilience; 2. Fostering sustainable growth and prosperity 3. Promoting environmental protection, climate change resilience and preparedness, and civil protection. The EU and their Black Sea partners will implement three flagship initiatives under these pillars to unlock growth in the Black Sea region while addressing conflict and security challenges: **The Black Sea Maritime Security initiative** will improve maritime safety, protect critical infrastructure, and enhance regional cooperation on demining and environmental risks. A **Connectivity Agenda** will develop transport, energy, and digital networks to position the Black Sea as a vital corridor connecting Europe to Central Asia, boosting economic growth. Coastal communities and blue economy sectors will be empowered to tackle war-related environmental damage, respond to climate change risks, and seize sustainable growth opportunities.

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Table 6. Key policy coherence for results upscaling feeding into regional strategies

Key policy coherence	European level	National level	Regional level/ Strategies
	What/How	**What/How**	**What/How**
Baltic Sea	● EU Biodiversity Strategy for 2030 sets overarching targets (30% marine protection, 10% strict) that guide national and regional planning. Encourages coherence across sectoral policies. ● MSFD: Mandates achieving GES, reinforcing ecosystem-based approaches in MSP and linking biodiversity with marine policy integration. ● MSP Directive: Requires all EU maritime countries to develop spatial plans that balance biodiversity, economy, and society, ensuring environmental priorities are embedded in MSP. ● CFP: Aligns fisheries management with biodiversity goals, helping integrate sustainable practices into MSP frameworks. ● European Green Deal (EGD): Pushes for a sustainable blue economy, ensuring climate and biodiversity considerations are built into regional marine strategies. ● European Maritime Fisheries and Aquaculture Fund (EMFAF) (Funding instrument): Provides financial support to member states and regions for biodiversity-friendly MSP, ecosystem restoration, and stakeholder engagement. ● Convention on Biological Diversity: International obligations reinforce EU commitments and drive integration of global biodiversity goals into regional MSP.	● National MSP plans: Align with HELCOM biodiversity goals, reflecting national integration of regional conservation targets (e.g., 30% protection goal). ● Inter-ministerial coordination mechanisms: Foster coherence between environmental and spatial planning authorities, enabling cross-sector alignment (e.g., biodiversity and fisheries). ● MPA-Biodiversity policy updates (e.g., Germany, Sweden): Countries adopt biodiversity policy frameworks (e.g., MPA networks) and planning tools (e.g., cumulative impact assessment, environmental assessments) to meet EU biodiversity and GES targets, often revising legal tools and management objectives.	● HELCOM-VASAB MSP Working Group: Serves as a regional platform for aligning MSP and biodiversity actions among Baltic Sea countries, promoting coherent planning processes. ● Baltic Sea Action Plan: Aims to restore good environmental status of the Baltic Sea by 2030, including biodiversity recovery and sustainable use of marine resources. ● HOLAS Assessments & HELCOM monitoring systems: Define status of the marine environment, provide shared environmental data, enabling harmonized decision-making and adaptive management. (e.g., HOLAS regional assessments data calls, HOLAS indicator results). ● HELCOM-VASAB MSP Roadmap 2030: Provides a joint regional strategy for advancing maritime spatial planning in the Baltic Sea region by 2030. ● Integration of ecosystem-based approaches: HELCOM's regional EBA guidance helps countries implement ecosystem-based MSP in line with EU directives. ● Helsinki Convention: the Helsinki Convention on the Protection of the

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	● EU Restoration Law & Ocean Pact: Offer legal and political frameworks to restore degraded marine ecosystems, which regions like the Baltic must incorporate into planning. ● EU Habitat and Birds Directives: Aims to conserve natural habitats and wild species, ensuring the long-term survival of Europe's most valuable and threatened biodiversity.		Marine Environment of the Baltic Sea Area aimed to promote the ecological restoration of the Baltic Sea Area and the preservation of its ecological balance.
North Sea	● MSFD Programme of Measures (PoM): Guides actions for achieving GES; basis for MSP decisions. Potential improvement for monitoring and data sharing part. ● EMFAF: In Belgium an important tool for the implementation of fishing regulations. Provides a six-year programme which can raise the ambition of biodiversity protection towards restoration and remediation. ● MSP Directive: Belgium has been a pioneer in implementing the EU MSP Directive, establishing its first legally binding MSPin 2014 and updating it for the 2020–2026 period. This plan aligns with EU policies by designating zones for offshore renewable energy, marine protected areas, and other maritime activities, aiming to balance ecological, economic, and social objectives. ● The EU Green Deal: Belgium is actively implementing the EU Green Deal in the marine domain through its MSP Plans, which supports the expansion of offshore renewable energy, while designating MPAs. The country also advances sustainable blue economy initiatives, integrates ecosystem-based management in spatial planning, and contributes to EU-wide goals such as the Biodiversity Strategy 2030 and the Offshore Renewable Energy Strategy, making the North Sea a testing ground for balancing clean energy, conservation, and maritime uses.	● Belgium has a Federal Sustainable Development Strategy. It provides cross-sector sustainability principles including concrete, federal measures and actions. ● Maritime Spatial Plan (MSP Act/ Royal Decree): Defines spatial zoning for all sea uses; includes MPA and sectoral zones. The third MSP will be implemented in 2026 for an 8-years period. It addresses renewable energy, particularly offshore wind energy. ● Coordination Committee for International Environmental Policy: A Belgian federal body responsible for ensuring the coordination and coherence of the country's international environmental policies across various government levels. It unites representatives from federal and regional administrations to align positions, particularly for EU and global negotiations. This mechanism facilitates the development of unified strategies and positions in international environmental discussions. ● Belgium is working on the implementation of the EU Nature Restoration Law: national restoring plan, to be finished by June 2026. ● Marine Environment Act: this Belgian national policy provides the framework for implementing marine conservation tools	● The implementation of CFP measures, particularly Article 11, presents challenges for the adoption of protective measures. Belgium is preparing a joint recommendation with Member States engaged in fishing activities in the Belgian part of the North Sea to introduce fishing restrictions. ● OSPAR Regional Strategies (e.g. NEAES 2030): Guides coherence of MPAs across borders; influences Belgian MPA goals. There is a need for threshold levels. ● The Greater North Sea Basin Initiative (GNSBI): facilitates regional dialogue and cooperation on MSP and biodiversity conservation

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	● EU Biodiversity Strategy until 2030: Belgium has designated nearly 38% of its North Sea waters as MPAs, aligning with the EU Biodiversity Strategy's target of protecting 30% of marine areas by 2030.However, challenges remain in ensuring the effectiveness of these protections, as studies indicate that many MPAs across the EU offer limited safeguards against industrial activities.	such as Marine Protected Areas (MPAs). It also offers the legal basis for establishing marine reserves in support of the 10% strict protection target. ● The Belgian Marine Data Centre is a national hubthat collects, manages, and disseminates marine data in Belgium. It supports Belgium's contribution to international marine data initiatives, including the EMODnet.	
Atlantic Ocean	● Portugal adheres to various EU directives (e.g., MSFD, Birds/Habitats Directives), international agreements (e.g., OSPAR), and national legislation. Agencies like the Institute for Nature Conservation and Forests play a central role in conservation and management, including oversight of MPAs.The alignment with EU directives like the MSFD, WFD, and CFP, combined with Horizon Europe funding, supports legal, technical, and financial capacities. ● EU Atlantic Action Plan 2.0 (2020) provides a common framework for cooperation between Atlantic coastal countries to promote the sustainable blue economy while improving environmental protection, including marine biodiversity, fisheries sustainability, and clean energy. ● Guidelines for implementing an EBA in MSP were developed by the European Commission to help Member States integrate biodiversity concerns and EBA principles into spatial plans.	● Portugal is reviewing its MPAs system at the present, in order to achieve the 30/10 objectives and other ones as conectivity and representativity. ● Portugal is working to adopt the EU Restauration Law. ● France's MSP (DSF) for the Atlantic includes cartographic overlays of MPAs, essential fish habitats, and potential areas for stricter protection. The 2nd generation of MSP documents includes updated biodiversity targets aligned with the EU Biodiversity Strategy. ● France's National Strategy for the Sea and the Coast promotes an ecosystem-based, cross-sectoral vision for maritime policy, integrating climate change adaptation, blue carbon, and the protection of marine biodiversity. ● Cross-ministerial cooperation between fisheries and environment ministries (e.g., in France and Spain) helps coordinate MPA designation and fisheries management in key biodiversity areas such as the Bay of Biscay or the Iroise Sea.	●The Blue Azores Programme continues to implement the Azores Network of Marine Protected Area (RAMPA). After the first stage rof new design of offshore network areas, follows: revision of coastal areas network; implementation of the RAMPA strategy; elaboration and implementation of tailored management plans for each area. ● North-East Atlantic Environment Strategy 2030 (NEAES 2030) outlines regional objectives for clean, biologically diverse, and sustainably used seas, aiming to apply an ecosystem approach and integrate biodiversity goals across sectors including fisheries. ● Joint OSPAR-NEAFC Collective Arrangement (2014) promotes cooperation in ABNJ, enhancing policy coherence between biodiversity protection and fisheries management. ● OSPAR Quality Status Report 2023 (QSR) offers a science-policy interface tool, assessing the effectiveness of existing measures and guiding future biodiversity and fisheries policy across the region.

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			● Regional MPA network and data platforms coordinated by OSPAR support joint spatial management, monitoring, and reporting of protected areas and species. ● OSPAR's Thematic Strategies (e.g., on biodiversity, eutrophication, hazardous substances) and work on cumulative pressures (in coordination with MSFD reporting) provide a structured regional framework for EBM-compatible policy implementation.
Mediterranean Sea	Different EU initiatives supporting policy coherence between blue economy sectors and ecosystem management include: ● The WestMED Initiative, launched in 2017, builds on years of collaboration between ten Western Mediterranean countries. It aims towards a smarter Blue Economy, also by safeguarding ecosystems and biodiversity. ● The MED-MSP-CoP, that is voluntary network of MSP experts from EU and non-EU Mediterranean countries, established in January 2023 by CINEA and DG MARE. ● The EU Strategy for the Adriatic and Ionian Region (EUSAIR), promotes cross-border cooperation to improve marine and coastal biodiversity management, strengthen MSP and ICZM coordination, and aims to conserve at least 30% of the region's coastal and marine areas by 2030.	● France's MSP plans include a zoning exercise where existing MPAs are mapped. According to French legislation, there is a policy expectation that strictly protected areas should be designated within the perimeter of these MPAs. Potential strictly protected areas have also been mapped in the second phase of French MSP documents, linking MSP to the conservation goals of the EU Biodiversity Strategy. ● Italian MSP plan (https://www.sid.mit.gov.it/mappa) was approved at the end of 2024. The planning scenarios proposed in the context of the Italian National Recovery and Resilience Plan projects could be taken into account in the next revisions of the plan. ● MPA planning: France and Italy work together to balance biodiversity conservation with economic goals through inter-ministerial collaboration (e.g. Pelagos Sanctuary) ● France's National Strategy for the Sea and the Coast integrates climate adaptation measures into MSP processes, focusing on carbon sequestration and	Key policies and initiatives within the Barcelona Convention framework addressing policy coherence towards overall ecosystem management: ●ICZM Protocol ●Conceptual Framework for Implementing MSP in the Mediterranean ● Working group for MSP, established as part of COP Decision 26/10 ● Post-2020 Strategic Action Programme for the Conservation of Biodiversity and Sustainable Management of Natural Resources in the Mediterranean Region (Post-2020 SAPBIO) ● Integrated Monitoring and Assessment Programme- for 11 ecological objectives (Decision IG 22/7) ● Mediterranean Strategy for Sustainable Development: updated Strategy being prepared for the period 2026-2035 ● Joint MPA monitoring: collaborative monitoring of MPAs through shared

		biodiversity conservation. French SNML is integrated in MSP through ecosystem-based adaptation measures and blue carbon integration.	databases and data platforms (e.g. MedPAN network), coordinated scientific research ● Supporting coherent and effective policies to increase the resilience of coastal and marine ecological and socio-economic systems: e.g. Regional CC Adaptation Framework for the Mediterranean Marine and Coastal Area. Updated version should be adopted on 24 UNEP/MAP COP.
Black Sea	● MSP Directive (Directive 2014/89/EU), implemented in Bulgaria and Romania as the EU MS, involving also other non-EU Black Sea countries in different formats. The two EMFAF projects MARSPLAN-BS I and II supported the cross-border collaboration and the implementation of the MSPD. These components pertain to fostering collaboration among MSP authorities, strategies for land-sea interaction, transnational MSP initiatives aimed at MPAs coherence, the utilization of comparable data, cross-border comprehension. Alignment cycles of MSPD, WFD, and MSFD would enhance their operational integration. Additionally, monitoring the effects of MSP on the attainment of other policy objectives and reporting on these outcomes is crucial for advancing policy integration. ● European Green Deal (COM/2019/640 final): EGD implementation has been facilitated by greater coherence of MSP plans among Bulgaria and Romania, trying to involve also the non-EU Black Sea countries. Plans ought to aim for not only functional coherence in relation to EGD objectives but also strategic coherence concerning their broader goals and visions. This can be accomplished by leveraging existing	● Biodiversity and ecosystem protection are widely considered in the MSP Plan's goals and scenarios as cross-cutting and overarching priorities, referring to the implementation of the MSFD for Good Environmental Status, the WFD for Good Surface Water Status, and environmental national legislation. ● The Bulgarian MSP Plan is supported by EIA and a document by the Ministry of Environment and Water (MOEW) with additional measures to reach the targets of the EU Biodiversity Strategy 2030. The Plan was approved on 11 of May 2023 by the Council of Ministers of the Republic of Bulgaria. ● The MSP Plan integrates all existing MPAs (nationally designated and Natura 2000), it does not envisage areas for new or extended MPAs, but supports reaching the targets of the EU Biodiversity Strategy 2030 and progression of the MPAs network. ● MPAs and MSP processes are still not well linked (MPAs establishment, designation and management is a separate process from MSP and is regulated/guided by environmental legislation (Protected	● Bucharest Convention (1992): the Convention on the Protection of the Black Sea Against Pollution plays a crucial role in biodiversity and ecosystem protection, coherent MPAs regional network and promoting sustainable blue economies, especially by encouraging stakeholder participation. A coordinated strategy, improved cross-border cooperation, and the development of appropriate implementation mechanisms are essential. ● Two EMFAF Black Sea projects (MARSPLAN-BS I and II): to support transboundary MSP and MPAs coherence, involving also the non-EU Black Sea countries. ● The EMFAF MSP-GREEN project and results for the Black Sea Basin (Bulgarian case) supports the integration of EGD objectives in MSP at regional sea basin level. ● Common Maritime Agenda for the Black Sea signed by all Black Sea countries in 2019, in Bucharest, Romania. It is aiming to guide the main priorities towards sustainable Blue

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	frameworks, including the EU Member State Expert Group on MSP, structures established under sea-basin convention, macro-regional strategies, and various regional initiatives. Additionally, thematic EU funded cross-border projects (EMFAF MARSPLAN-BS II and MSP-GREEN) and CoPs under the MSP4BIO have been utilized to support these efforts. ● EU Biodiversity Strategy 2030: essential factors for the conservation and restoration of Black Sea biodiversity in MSP involve creating a unified network of MPAs, aiming to protect 30% of marine regions (with 10% designated for strict protection), fostering multi-use opportunities that promote synergies between biodiversity conservation and maritime endeavors, and supporting coordinated transboundary initiatives to enhance conservation results. ●EMFAF: Provides financial support to EU MS and sea basins for nature-inclusive MSP, ecosystem restoration, transboundary cooperation and active stakeholder engagement. ● The European Ocean Pact[5] (2024-2029)– seeks to foster a broader, integrated and holistic approach to ocean governance across all sectors, including both internal and external policies. The pact aims in particular to: maintain a healthy, resilient, and productive ocean, while promoting a sustainable and competitive blue economy, including fisheries and aquaculture.	Areas Act, 1998 and Biodiversity Act, 2002). ● The need for better coherence between the MPA network and spatial planning was also highlighted in all interactions with CoP members. On the other hand, the policies in the area concerning MPAs were considered to be adequately reflected and integrated in the MSP. ● Even the MSFD and WFD are integrated in the MSP Plan and they informed the planning process, the national legislation and strategies disregard the MSP as an integrated tool and process for achieving the good ecological status of marine waters. ● The MSP Plan in Romania identifies MPAs as vital for protecting coastal and marine ecosystems. It highlights that the national MPA network must cover enough area for effective protection, linked by 'ecological corridors' to support marine species movement and reproduction. However, it does not allocate exact new MPA locations, only stating that at least 30% of sea area should be protected, with 10% under strict protection.	Economy of the Basin, including improved ecosystem services and management, as well as blue research and innovations, investments, capacity building and jobs creation. ● The Black Sea Assistance Mechanism[6] supports counties in achieving blue economy goals from the Common Maritime Agenda for the Black Sea. It aims to boost local and regional stakeholders' awareness and skills by providing expertise, creating a cross-border network for project leaders to find partners, and offering support for project development and funding opportunities.

[5] COM (2025) 281 final COMMUNICATION from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Ocean Pact, Brussels, 5.6.2025.

[6]Since November 2022, it has joined a collaborative Assistance Mechanism with the Atlantic Action Plan and WestMed initiative to improve synergies and coordinated policy responses across sea basins.

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7 Final recommendations for transferability and scaling up of effective biodiversity mainstreaming in MSP for each of the sea basins to support regional strategies

Baltic Sea

To scale up and consolidate the MSP4BIO Baltic Sea test site results at the regional level, a coordinated and policy-informed approach is essential to address persistent fragmentation in biodiversity governance and MSP. While the Baltic region benefits from a robust institutional and policy landscape, key barriers remain in aligning ecological, social, and economic priorities within spatial planning processes across all marine sectors.

1. Addressing Structural Pitfalls through Regional Cooperation

The Baltic test site revealed several systemic challenges: fragmented policy coherence between national and EU-level strategies (e.g. CFP vs national plans), biodiversity blind spots in sectoral planning, and limited spatial resolution in cumulative impact assessments. Sector-specific shortcomings, such as shallow-water trawling exemptions in fisheries, under-addressed cumulative impacts from aquaculture and tourism, and lack of biodiversity-sensitive site selection in offshore renewables highlight the urgent need for more integrated planning frameworks. Additionally, socio-economic resistance to EBM-aligned restrictions and narrow monitoring scopes in fisheries and other sectors limit adaptive management capacities.

2. Promoting Enabling Conditions and Good practices

The Baltic region, however, also demonstrates multiple enablers for EBM integration. The HELCOM-VASAB MSP Working Group and HELCOM's thematic groups (e.g., on sustainable fisheries and pressures) provide a solid base for knowledge exchange, data harmonization, and regional coordination. Strategic documents such as the Baltic Sea Action Plan and the HELCOM-VASAB MSP Roadmap 2030 create a framework to align national MSPs with biodiversity goals, supporting the uptake of tools like SPIA, PW4Blue and Symphony. Policy coherence is further strengthened through regional application of European and global frameworks, and these frameworks guide Baltic countries in achieving targets such as 30% protection and 10% strict protection, while aligning national MSP plans with GES requirements and ecosystem-based approaches.

3. Promoting Science-based, Stakeholder-led planning

MSP4BIO tools like SeaSketch, SPIA and the ESE Framework should be further adopted at regional and national levels to support biodiversity-inclusive planning and transparent trade-off analysis. The Baltic Sea Tourism Center and stakeholder platforms like the Baltic Sea Regional Aquaculture Dialogue offer mechanisms to include sectoral voices in spatial

decisions. Training and capacity-building efforts, especially on cumulative impact assessment and biodiversity-sensitive siting of marine uses, are crucial for increasing uptake of MSP4BIO recommendations.

4. Enhancing Transboundary Coherence and Data Integration

Shared monitoring systems (e.g. HOLAS assessments) and indicator frameworks (e.g., HELCOM indicators) support harmonized impact assessment and adaptive MSP across the region. Tools and methodologies developed in MSP4BIO, such as prioritization and connectivity analysis, can feed into HELCOM's green infrastructure mapping and marine restoration efforts. Further, the growing role of cross-border dialogues under the EUSBSR and HELCOM-VASAB MSP Data ESG points to opportunities for joint planning and biodiversity protection at basin scale.

5. Recommendations for scaling up

- Build on existing HELCOM and HELCOM-VASAB structures to integrate MSP4BIO tools into regional MSP and MPA planning cycles.
- Ensure national MSP updates adopt ecosystem-based approaches, supported by cumulative impact tools with high spatial resolution.
- Incorporate MSP4BIO outcomes (e.g., impact levels of HELCOM MPAs) into green infrastructure maps, as highlighted in the objectives of the Baltic Sea Regional MSP Road Map.
- Improve alignment between fisheries management, MPAs, and biodiversity restoration targets through the uptake of HELCOM recommendations and regional indicators.
- Expand capacity-building and stakeholder dialogue (e.g., by using SeaSketch trade-off assessments) to better integrate socio-economic and cultural ecosystem services into MSP.
- Use existing regional strategies (e.g., BSAP, MSP Roadmap 2030) to anchor strict protection and ecological coherence principles in upcoming MSP reviews.

North Sea

1. Strengthening Transboundary Marine Biodiversity Governance

- Effective MSP in the North Sea requires collaborative, cross-border action to address the ecological realities of marine ecosystems, which extend beyond national boundaries. One of the key takeaways from the Belgian MSP4BIO test site is the need for enhanced regional coordination to manage pelagic habitats and mobile species. These habitats are defined by wide-ranging larval dispersal and complex food-web interactions that cannot be sufficiently addressed through national approaches alone.
- *OSPAR* offers a valuable framework for such cooperation. By fostering shared methods, joint research, and coordinated data platforms, OSPAR can support climate-resilient planning across the North Sea basin. In particular, regional

collaboration is essential to assess and respond to climate change impacts on mobile species, requiring joint monitoring, shared datasets, and coordinated management strategies. The inclusion of more dynamic and flexible protection measures for Natura 2000 marine sites, informed by OSPAR guidelines, would enable better responsiveness to changing species distributions and environmental conditions.

2. Integrating Ecological and Socio-economic Objectives

- Belgium's experience within MSP4BIO demonstrates the value of site-specific planning to reconcile ecological restoration with sustainable economic development. For instance, the creation of strict MPAs offers a promising opportunity to investigate spill-over effects, where ecological benefits extend beyond protected zones, potentially enhancing fisheries and local economies. Quantifying these effects would support evidence-based policymaking, helping to balance conservation with blue economy goals.
- Additionally, the MSP4BIO ESE Framework should be further developed into a smart, interactive, and user-friendly digital tool. This would facilitate adoption by planners and stakeholders at multiple governance levels. To ensure broad uptake, capacity-building and training should accompany the rollout of the ESE Framework and the MSP4BIO DSTs, enabling their practical integration into MSP and MPA planning.

3. Designing Standardized, Transparent Planning Processes

- MSP processes across the North Sea would benefit from more standardized methodologies that allow for equal integration of ecological, social, and economic priorities. The ESE Framework provides a blueprint for this, particularly through tools such as the ABC Planner, and trade-off analysis enabling prioritisation between competing spatial uses − e.g., new MPA designations vs. offshore energy concessions.
- Such standardisation would ensure greater transparency and comparability across Member States, supporting fairer negotiations and improved cross-border cooperation. It would also enhance the strategic alignment of national MSPs with overarching EU objectives.

4. Aligning the Common Fisheries Policy with Biodiversity Goals

- One of the key gaps identified through the work in the Belgian test site is the misalignment between the EU CFP and biodiversity protection objectives. Improved coherence is urgently needed to ensure sustainable fisheries management, especially for high-value migratory species and vulnerable habitats.
- More adaptive, biodiversity-sensitive fisheries policies − integrated with spatial planning tools − could enhance enforcement, reduce illegal and unreported fishing, and provide a more coherent framework for managing shared fish stocks. This is particularly important in light of transboundary pressures and changing marine ecosystems due to climate change.

5. Science-based, Stakeholder-led, and Cross-sectoral Planning

- Finalized in 2020, the North Sea Agreement is a comprehensive political agreement between the Dutch government and a broad coalition of different stakeholders.
- Its goal is to coordinate space use in the Dutch part of the North Sea to meet energy transition goals while enhancing marine nature protection and supporting sustainable fisheries. This good practice should be upscaled at the sea-basin level as a real-world example of how to deliver on biodiversity goals alongside economic and climate targets.

6. Advancing Sea Basin-Wide Cooperation

- To address the limitations of fragmented governance in the North Sea, the MSP4BIO project highlights the importance of establishing robust, regional governance mechanisms that facilitate real-time collaboration, data exchange, and joint decision-making. This includes promoting common guidelines, shared ecosystem-based targets, and the harmonisation of spatial planning approaches.

7. Dissemination, Promotion and Capitalization of Results

- **Capitalize Through EU and Regional Projects**: encourage the use of the MSP4BIO ESE Framework and digital tools in future MSP and marine conservation projects under EU programmes like EMFAF, Horizon Europe, and LIFE. Promoting replication or further development of these tools will enhance policy coherence and continuity.
- **Community of Practice & Knowledge Transfer**: use the established Community of Practice to facilitate peer learning, exchange of national experiences, and further co-creation of solutions. This network can serve as a long-term channel for sharing updates, case studies, and new applications of MSP4BIO methods.
- **Training and Capacity Building**: organize workshops and webinars in the North Sea region to train authorities, practitioners, and NGOs for the use of the MSP4BIO DSTs, especially the ABC Planner and the ESE Framework. This will increase ownership and foster practical application.
- **Open Access Data and Tools**: Ensure long-term accessibility and visibility of the project's digital tools and datasets, including the data base created in the project: https://msp4bio.vliz.be/. This will support continuity, transparency, and policy uptake.

Atlantic Ocean:

Drawing on lessons from the Azores and Cadiz test sites, the following strategic recommendations aim to overcome governance silos, strengthen data and stakeholder

engagement, balance socio-ecological objectives, and ensure policy coherence in the North-East Atlantic.

1. Institutionalise Multi-Level and Cross-Sectoral Coordination Platforms

- Establish or strengthen formal mechanisms that bridge governance gaps between local, regional, and national authorities, as well as across different sectors (e.g., fisheries, environment, spatial planning). The "Coast-to-Coast Commission" model from Cadiz is consistently highlighted as a replicable approach.

2. Align MSP/MPA with EU and Regional Strategies

- Embed site-level measures (e.g. Graciosa's zoning, Cádiz's blue-economy linkages) into overarching frameworks − OSPAR NEAES 2030, EU Atlantic Action Plan 2.0, MSFD/MSPD and national blue-growth strategies − using policy "crosswalks" or audit tools.

3. Enhance Participatory Governance and Capacity Building for Stakeholders

- Expand inclusive co-design and participatory governance processes for MSP and MPA planning. This involves actively engaging a wide range of stakeholders, especially local communities, small-scale fishers, and NGOs. Furthermore, test site results highlight the need for targeted capacity-building programs to empower these stakeholders with the necessary knowledge and tools.

4. Promote Data Sharing, Knowledge Exchange, and Adaptive Management

- Improve data sharing and knowledge transfer mechanisms. This includes establishing or enhancing regional networks for sharing best practices, integrating local data and traditional ecological knowledge into regional assessments, and adopting adaptive management frameworks that account for ecological complexity and climate change impacts. For instance, standardizing and integrating test-site protocols (MoniCO benthic surveys, Cadiz socio-economics) into a regional data portal (EMODnet/AquaSpace) with uniform MSFD reporting templates.

5.Integrate Socio-Ecological Trade-Offs and Blue Economy Objectives

- Integrate blue economy objectives with conservation goals, promoting solutions that balance sustainable economic development with ecosystem health. This includes exploring co-location opportunities for different marine uses (e.g., responsible tourism, sustainable aquaculture, and MPAs) and using tools like CEA and ecosystem service mapping.

6. Strengthen MPA Effectiveness through Policy Coherence

- Harmonize key policy instruments (MSFD, MSPD, CFP, EU Biodiversity Strategy) and embed binding biodiversity targets in MSP/MPAs.

Mediterranean Sea Basin

The implementation of the ESE methodology in the complex and dynamic context of the NW Mediterranean demonstrated how operational tools can support the ongoing development and implementation of marine policies, particularly within MSP processes. Despite different levels of MSP maturity across Mediterranean countries and a high density of transboundary issues, the NWMed pilot successfully delivered participatory, forward-looking, and climate-aware planning insights. This experience offers concrete entry points for broader Mediterranean replication.

1. Leveraging Scenario-Based Planning for Regional Transferability

The three scenarios tested in NW Mediterranean − *Slow Pace*, *Nature@Work*, and *Blue Development* − provide a replicable approach to explore options for addressing marine conservation under different policy and socio-economic assumptions. This approach could be adapted to other marine ecoregions in the Mediterranean with adjustments to the socio-ecological context, stakeholder landscape, and planning timelines.

This application across the basin would allow other subregions to:

- Test the feasibility of meeting biodiversity and climate targets under differing levels of ambition: the test-sites analysis showed that N@W and Blue development scenarios have ambitious goals and explore possible trajectories for nature protection and blue sector aspects promotion, while “Slow Pace” scenario follows current developments with little ambition toward blue economy sectors or marine environmental protection goals, demonstrating how scenario testing can realistically assess the impacts of different planning ambitions.
- Provide administrations with evidence-based pathways for reaching targets like 10% strict protection: the method combined expert knowledge, stakeholder input, and planning tools to support policy makers in evaluating plausible pathways, demonstrating that 10% strict protection target can only be reached by Nature@Work scenario, although very close with Blue development one.

2. Maintaining and Expanding Participatory Tools

The participatory mapping platform developed in NWMed is an operational, living tool that facilitates stakeholder contributions, scientific inputs, and administrative validation of marine areas of interest. Its maintenance beyond the project is key to ensure continuity. Such platforms could serve as a participatory interface to:

- Enable cumulative knowledge gathering across jurisdictions: users will be able to continue providing suggestions and contributions post-project, supported by the tool’s ongoing availability.
- Inform regionally coherent networks of strict protection areas.
- Foster a spatial data sharing approach aligned with EU and Barcelona Convention principles: the developed tool and documentation, publicly available, promote transparency and reuse by all stakeholders.

3. Climate-Smart Marine Planning as a Regional Priority

NWMed's integration of climate change (CC) dimensions in the initial phases of the pilot activities − despite difficulty in using science-grounded projections − shows the value of embedding climate risk assessment in marine planning from the start. Scaling this effort would mean:

- Promoting CC-inclusive scoping methods (e.g., horizon scanning, interviews, and expert workshops) to move toward climate-smart MSP and MPA networks.
- Capitalizing on recent knowledge development as well as change of European data sharing policies leading to the promotion of more collaborative and open-science approaches.
- Mainstreaming tools like climatic velocities and habitat suitability models in subregional assessments.

This would help ensure that MSP across the Mediterranean is climate-smart and aligned with resilience and mitigation goals.

4. Fostering Transboundary Collaboration and Knowledge Translation

The NWMed site highlighted both the challenges and opportunities in cross-border collaboration. Scaling this basin-wide involves:

- Creating structured channels for cooperation between scientific communities and public authorities at national and subregional scales: In NWMed, joint initiatives on deep-sea zones strengthened coordination across countries.
- Systematically integrating transboundary research into planning processes through shared frameworks and guidance.
- Supporting local community-building and cross-disciplinary linkages to bridge science-policy gaps: the work done in the NWMed test site supports the local community building through the connection of different activities and initiatives, and proposing a guidance to analyse knowledge and enhance trust and data uptake.

5. Building on Opportunities and Institutional Anchoring

Several immediate opportunities identified in NWMed such as the democratization of deep-sea data collection and the convergence of scientific efforts can be mobilized to build Mediterranean-wide initiatives. Moreover, coordination with regional regulatory bodies such as GFCM and IHO is essential to ensure:

- Alignment with existing legal instruments and regional policies on VMEs and cetaceans: the NWMed test-site built on outputs from previous GFCM-recognized campaigns to ground its protection proposals.
- Amplification of results within competent international fora: the results of the project should be promoted with regional organisations to ensure their use and uptake for future initiatives.
- Usability of tools and outputs (including publicly accessible technical reports and outputs) in relevant training and peer-learning contexts.

The NWMed pilot provides a practical, tested model for supporting MSP that is participatory, climate-smart, and policy-responsive. Scaling up its methodologies and tools across the Mediterranean basin − adapted to local contexts and institutional realities − can significantly advance coherent, science-informed MSP at basin scale. These efforts will be instrumental in achieving the 30x30 targets and the climate resilience of the Mediterranean marine ecosystems, as agreed under the EU and the Barcelona Convention roadmaps.

Black Sea

1. Convey Test Site Results to Support Regional Frameworks

- To facilitate the uptake and scaling up of the Black Sea test site results to a regional level, it is crucial to align the suggested integration of MSP and MPA management with existing regional strategies. This includes the Black Sea Convention, the Common Maritime Agenda, the European Biodiversity Strategy, and the European Green Deal, while also involving non-EU countries.
- Strengthen regional cooperation frameworks by enhancing the use and integration of MSP4BIO ESE tools, trade-offs methods and CEA ensuring harmonized responses to both environmental threats and security challenges
- Scaling up the outcomes of the planning solution involves addressing challenges such as inconsistent support for MSP efforts at regional level, a lack of awareness regarding social factors, involvement of diverse stakeholder groups from the outset of the planning process, and the need for political commitment to effectively integrate MSP and MPA frameworks at both national and cross-border levels.

2. Increase Capacity Building and Training

- Initiatives should be implemented to empower local, national and regional stakeholders with the knowledge and DSTs necessary for effective participation in MSP and MPA processes. These also include capacity building initiatives focused on engagement, communication, and negotiation with stakeholders, including MSP planners and MPAs managers to develop essential skills.
- Identify ways to improve the use of inter-stakeholder platforms for exchanging knowledge, experiences, and best practices. Suggest strategies to better engage national and regional stakeholders, and explore effective methods for creating or strengthening this engagement, such as awareness campaigns, training sessions, and encouraging local citizens to actively participate in identifying critical challenges and benefits related to enhanced marine protection and the support of MSP. This could include utilizing multi-use platforms, partnership forums, training of trainers, and interactive dialogue, among other strategies.
- Organize trainings of trainers on sustainable use of marine resources and MSP-MPAs nexus: these training initiatives should aim to educate and equip with the MSP4BIO tools and results MSP planners, MPAs managers, decision-makers, and sector representatives, enabling them to further guide and train other relevant

stakeholders. Such training and capacity building is crucial for generating employment opportunities within coastal and maritime communities.

3. Leveraging Science-Driven MSP to Enhance Regional Efforts on Biodiversity Protection

- Utilize the capacity of knowledge-based MSP equipped with MSP4BIO tools to address emerging challenges, including climate change and impacts on biodiversity protection, the implementation of the EGD objectives and reaching the targets of 30 % protected and 10% strictly protected MPAs.
- MSP should contribute to enhancing Black Sea regional cooperation on biodiversity conservation, for instance by focusing on cross-border protection needs by thematic cross-border/sea basin projects and established Black Sea CoP.
- Coherent and coordinated MSP across the Black Sea can support more efficient and effective design of coherent MPA networks, alongside other strategic priorities such as offshore renewable energy. The MSP4BIO Black Sea cross-border test site provides a planning solution for aligning MPAs with MSP to promote cohesive networking and improve MSP to bolster and advance current conservation strategies, ensuring they are consistent, efficient, and collaboratively managed at both national and cross-border scales.
- MSP should strengthen its role as a facilitator and advocate for integration of biodiversity conservation and natural capital by embracing a more strategic and proactive approach that goes beyond the traditional 10-year planning cycle.
- MSP in the Black Sea basin can improve the development of coherent MPA networks in a more efficient and effective way. A regional strategy aligned with the 30by30 strategy can better protect biodiversity than national strategies alone.

4. Strengthen Regional Co-Creation and Collaboration among Stakeholders

- Establishing a regional Black Sea CoP by creating a network/platform to share best practices and lessons learned across similar coastal and marine areas can promote wider adoption of successful strategies ultimately fostering sustainable development and ecological resilience throughout the region.
- The Black Sea test site cross-border CoP, including Bulgaria, Romania, and key regional stakeholders (the Black Sea Commission and the BSEC), was established under MSP4BIO. It has played a crucial role in co-developing and validating interactions during the project and could serve as a foundation for a regional Black Sea CoP.
- The CoP should develop a common strategy on key MSP and MPAs priorities and issues. This strategy must be communicated to regional policymakers and integrated into MSP processes, including stakeholder engagement, to ensure cross-border consistency. This will allow the CoP to enhance the voices of MSP practitioners an MPAs managers in the region, an area that has been insufficiently addressed and requires proper framing and implementation.

- The experiences of the CoPs are thriving in other EU sea basins and the Black Sea CoP should engage in dialogue and share insights with these initiatives to foster mutual enrichment regarding objectives, methodologies, and content. This collaboration would help to establish a coherent stance on the integrated role of MSP and the CoP tackling future challenges, particularly the ambitious goals of the EGD and the EOP. The parallel implementation of the MSP4BIO sister projects, along with synergies from initiatives in other marine regions, presents a significant opportunity in this regard.

5. Facilitate the Uptake of Utilized ESE DSTs and Tangible Application Results at Regional Level

- The proposed site-specific planning solution, based on trade-off analysis, presents significant opportunities for replicability and transferability to other test sites and beyond. This is due to its structured approach that encompass ecological and socio-economic considerations using the integrated ESE framework, particularly the ESE1 and the ESE3.
- The methodologies employed, such as Participatory Mapping with the help of the Sea Sketch tool, stakeholder engagement and trade-off method through the CoP, can be adapted to various coastal and marine environments, fostering collaborative decision-making and planning. Trade-off analysis is helpful to bring together diverse quantitative and qualitative information and data for MSP and MPA management to rank development scenarios based on stakeholder's perception and values.
- The SeaSketch tool can be used to incorporate transboundary and cross-border information, and data on sea activities, ecological features and MPAs at the Black Sea regional level. PW4B is currently focused on the Baltic Sea but can be adapted for other regions with the necessary data, as shown by its use in the Black Sea.

6.Dissemination, Promotion and Capitalization of Results

- Efforts should be made to enhance the availability, accessibility, and usability of specific data regarding the marine environment to support informed decision-making in MSP. MSP4BIO provides a comprehensive overview of the available biodiversity datasets and platforms relevant for planning. The MSP4BIO Data Compilation App helps to filter all compiled datasets, data platforms, and tools, and it can be accessed on: https://msp4bio.vliz.be/
- The D5.3 report focuses on planning solutions in each test site, intended to provide guidance and inspirations for MSP planners and MPA managers, also applicable to various coastal and marine regions within the EU and beyond, as published on the MSP4BIO website: https://msp4bio.eu/wp-content/uploads/2025/04/D5.3-Test-sites-planning-solutions-revised-Final-checked-260325-for-website.pdf. Furthermore, the webinar held on April 9, 2025, highlighted the innovative solutions developed for the test sites, showcasing the insights and benefits obtained. It also discussed the current challenges and outlined the essential next steps for the

successful implementation of these solutions: https://msp4bio.eu/echoes-of-the-msp4bio-webinar-nature-inclusive-msp-insights-from-msp4bio-test-sites/

- Story maps published on the MSP4BIO website to showcase the test sites and results from the operationalization of the flexible ESE Integrated Framework: https://msp4bio.eu/western-black-sea-test-site-bulgaria/; https://msp4bio.eu/western-black-sea-test-site-romania/
- Dissemination of the Black Sea test site results to national MSP and MPAs authorities, key regional actors and sector-competent authorities in dedicated events (such as the Black Sea Basin Workshop "Bridging Maritime Spatial Planning with the European Green Deal and better Integrate Marine Protected Areas" on June 20th 2024 in Varna, Bulgaria as a hybrid event, jointly organised by MSP-GREEN, MPA Europe and MSP4BIO projects).

7. Enhance Governance and Policy Alignment at Sea Basin Level

- Strengthened integration between MSP and MSFD through a common regional approach is also considered highly relevant by the CoP members.
- Engaging in continuous dialogue with regional key actors, such as the Black Sea Commission and the BSEC will ensure that the innovative approaches and insights gained from the test site are reflected in broader governance frameworks.
- Encourage science-based policy-making process. This will contribute to an enhanced regional science-policy dialogue on formulating coastal and marine policies and programmes.
- Formulate a regional maritime vision and/or strategy within the context of MSP: This vision or strategy can also address wider national objectives and link the marine protection to multiple strategic and planning frameworks, including the MSP, MSFD, territorial development planning, the Common Maritime Agenda for the Black Sea, and other relevant EU and sea basin policies, including the EOP.

8. Strengthen Transboundary Collaboration on MSP-MPA Nexus

- The MSP4BIO trade-offs approach could be utilized to enhance and facilitate the wider stakeholder involvement in the MPAs/MSP decision-making at national level and develop consensus-based approaches to MPAs management and coherence at cross-border and transboundary regional level.
- Transboundary collaboration should be strengthened to involve also the non-EU countries; this could act as a flywheel for more funding opportunities, EU-funded projects, and regional initiatives on the MSP-EGD nexus, including its linkages with MPA planning and management.
- There is a need for common approach to MPAs identification and designation at regional level, and a need of common definition of strict protection.
- Support application of holistic regional EBM approach: it is required at all scales to deliver solutions that cost-effectively address the complexity of the sea basin space (including multi-use and cumulative effects, spatial interconnections

between ecosystems under different legal zoning, temporal variability and long-term implications). Key elements include MSP4BIO developments: participatory mapping, cumulative assessments of human impacts on natural resources, climate change scenarios, and support to restoration initiatives.

8 Validation of sea basin recommendations for scaling up of results and take-home messages from the MSP4BIO final event

To ensure wider uptake and capitalization of results, during the **MSP4BIO Final Event** (02-04 July 2025, Venice), an interactive validation session using slido survey was conducted, in which 29 out of 36 participants engaged with polls or Q&A (81%).

To the question *Which results are most transferable to your sea basin context?*, most participants pinpointed the MSP4BIO **DSTs, ESE Framework; Climate Change guidance; and trade-offs analysis**.

In response to another question, *Where in your national planning process could the ESE framework or DSTs be integrated?* the majority of participants highlighted the importance of integrating this into **the revision of national MSP plans**, **the application of SEA**, and **the revision of MPAs management plans**.

Figure 2 Interactive validation session at the MSP4BIO final event.

To the question *What adaptations would be required for successful transfer?* Various responses were received, including: **more management questions**; **specifying who should do what and when**; **high-resolution spatial data**; **capacity building for staff members**; **user-friendliness**; **inclusion of more content/examples**; **specifications for different policy processes**; **better usability**; and **integration of more tools**.

To the question *What is needed to scale these results at sub-basin or regional level?*, the participants shared a variety of responses, including **targeted management context**, **understanding regional needs**, **transnational cooperation**, **regional sea conventions, political commitment**, **multi-level translation**, more projects, local data, EU-level incentives, and high-resolution spatial data.

Much specific answers were provided to the question of *Who should lead the transfer or upscaling (EU agencies, RSCs, Member States)*. The options with the most support were **Sea Regional Conventions**, **EU agencies**, and **the EU**.

Lastly, in response to the question "*How could regional cooperation frameworks support this?*", various answers were provided, including **Communities of Practice (CoPs), utilizing existing cooperation frameworks like working groups**, **securing funding**, **adapting to regional policy documents**, **implementing regional projects**, **engaging with "real people,"** and **building trust between different national authorities**. Additionally, platforms and common initiatives, such as Interreg projects, were highlighted.

9 Conclusions

With the support of the MSP4BIO ESE Framework and the cutting-edge DSTs, the next round of national MSP plans will have a higher capacity to incorporate biodiversity conservation objectives into the planning process. Enhancing institutional and cross-sectoral coordination into MSP are crucial steps for effective biodiversity mainstreaming into MSP. Integrating CEA in MSP, along with capacity building and training in trade-offs and CEA, improves adaptive MPA management. Participatory mapping and CEA are valuable tools in MPA designation and management, as well as in MSP, providing assessments of how existing and new activities may impact the ecosystems within MPAs.

Integrating MSP with frameworks like MSFD, WFD, and SEA Directive, can enhance MPA designation and management. Establishing a common vision for MPAs designation and management within MSP is essential, along with addressing LSI to connect terrestrial and marine ecosystems. Engaging all stakeholders across sectors and governance levels is key, as the MSP process provides a platform for consultations and planning solutions.

Adopting an EBM for the blue economy sectors at the sea basin level highlights ongoing structural challenges, while also showcasing growing institutional momentum through the implemented and recently adopted EU MS MSP plans. This is supported as well as by regional strategies and frameworks aimed at fostering healthy and resilient marine

ecosystems. The key challenge facing most sea basins is the constraint of limited marine space, which results in spatial conflicts among human activities. Each sector is driven by its own interests and objectives, with a diverse array of stakeholder groups and authorities involved. There is an urgent need for improved coordination of marine activities and development of measures that are acceptable by all stakeholders. Another key pitfall is the fragmented governance of marine management, a challenge for many EU MS: the mandates are spread among different levels of government, making it difficult to coordinate stakeholder interests with conservation and spatial planning efforts. Thus, implementing EBM across key maritime sectors reveals entrenched governance fragmentation, scale mismatches, and high-quality spatial data limitations that continue to hinder biodiversity mainstreaming.

Yet, strong enablers at sea basin level, such as growing alignment between regional initiatives, the EU policy objectives, and the MSP frameworks presents great opportunities to advance the ecosystem-based approaches. The revision process of the MSP plans should have established a platform for discussing current sectoral and conservation needs among government authorities and stakeholders, aligning with the new ambitious of the plans.

An important insight is the need to reconceptualize conservation not just as a competing sectoral interest, but as the fundamental basis for all economic activities in the marine environment. Additionally, increasing the quality and effectiveness of MPAs through stronger protection levels would create mutual benefits for ecosystems and blue economy sectors. MSP incorporates a robust governance framework to support this, ensuring it is ecosystem- and science-based, making it essential for climate-smart and EGD-compliant spatial planning.

The EOP brings together the EU policies and actions related to the ocean and creates a unified and coordinated plan for managing the ocean. To support EU MS to restore degraded coastal and marine habitats, the EOP proposes to evaluate and revise the MSP Directive, to encourage MS to establish and effectively manage MPAs, and to create European blue carbon reserves. For boosting the competitiveness of the EU sustainable blue economy, the EOP proposes to evaluate the CFP and develop a vision 2040 for fisheries and aquaculture, boost the EU's maritime industry with a new industrial maritime strategy and an EU ports strategy launch a sustainable tourism strategy, and develop a blue generational renewal strategy.

To achieve the Ocean Pact's targets, the EC will present an **Ocean Act** by 2027 to establish a single framework to facilitate the implementation. It will be based on **a revised Maritime Spatial Planning Directive, which will enhance cross-sectoral coordination and sea basin management.**

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